

Jan Gyllenbok

Encyclopaedia of Historical Metrology, Weights, and Measures

Volume 2

Science Networks. Historical Studies

Science Networks. Historical Studies
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Encyclopaedia of Historical Metrology, Weights, and Measures

Volume 2

Jan Gyllenbok
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Preface

This second volume of the Encyclopaedia, as well as the third volume, addresses many of the units of measure used in sovereign states and land areas in the modern world, roughly 46,000 different measures in total. By using “modern world” in this context, I normally refer to the era starting with the Western European countries’ colonization of land areas, mainly in the Americas, Africa, Asia and Oceania, during the mid-18th century, and ending in 2016. But for some Western cultures, such as the Anglo-Saxon and Germanic peoples, I have been able to track information about units of measure going back to at least the 800s or 900s.

The principal states are recorded alphabetically. Minor states are noted within the text with cross-references to the major headings under which their full entries are to be found.

As the estimated values for the units of measurement often vary considerably from one source to another, I have chosen to mention the sources used consistently at the head of each section.

Lomma, Sweden
August 2017

Jan Gyllenbok

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List of Symbols and Abbreviations

!	A symbol for the factorial expression, i.e., $8! = 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$.
%	A symbol for percentage.
*	An alternative multiply symbol.
cf.	compare
depr.	deprecated
D	Dutch
Dan	Danish
e.g.	for example
Fr	French
Fin	Finnish
G	German
Gr	Greek
Heb	Hebrew
i.e.	that is
Imp	Imperial
L	Latin
N	Norwegian
OE	Old English
OF	Old French
ON	Old Norwegian
OS	Old Swedish
q.v.	which see
Sp	Spanish
Swe	Swedish
UK	United Kingdom
US	United States
W	Welsh

National Systems of Units and Currencies: A–C

This chapter compiles the measurement systems of sovereign states of the modern world; some are unrecognised states, others are consistent areas and there are also many nations that no longer exist as independent countries. Conversions to precise metric units are offered as a rough guide for estimation rather than a definitive accounting, which would warrant sophisticated supporting statistical analysis.

The principal states are recorded alphabetically. Minor states are noted within the text with cross-references to the major headings under which their full entries are to be found. A short history is included of most states and sub-states. [TURN] has been a most valuable source for this endeavour, as has [CUHA]. The listings also indicate the time during which most countries adopted the metric system. Because metrication is an evolutionary process that takes place over time, any attempt to assign a single year to a country's conversion is only an approximation. Frequently, both old and new systems function simultaneously for an indeterminate amount of time, often for more than one generation.

The set of entries is followed by a list of the main sources, articles, books, personal interviews and correspondences that have been used for this particular chapter. The most utilized sources are [BAUE], [DOUR], [ECON], [GRUN], [GUIL], [KELL4], [KLIM], [KRAE], [KRÜG], [MART3], [ROCH], [ROSS], [ROTT],

[TECH], [UN55], [UN66], [WAGN2] and [WASH]. These sources notwithstanding, this is not only a compilation of data from more than four hundred different written sources, but also includes some of my own assumptions, in reaction to instances in which sources have been contradictory or contained obvious errors.

Below this, you will also find the monetary systems of most countries, as well as a short presentation of the evolution of each system. The most utilized sources for this section have been [BERL], [BRUC], [CUHA], [CUHA2], [DUNK], [KAHN], [ROOM], [SNOD] and [YALC]. Since, according to [TOYN], more than 650 separate primitive societies have been categorized by anthropologists, the monetary systems used in these societies being only vaguely known, and since the systems used by the medieval states in Europe and Asia have not been fully identified, it is difficult to survey and compile these systems. In addition, a wide range of pre-metallic monies has been used as mediums for exchange, e.g., whale-teeth, Yap stones and cowrie shells, as well as cattle.¹

¹ The ovoid shells of the cowrie (especially *Monetaria moneta*) were commonly used as a medium of exchange in many areas of Africa, Asia and the Pacific islands until the early twentieth century. In ancient China, its pictograph was adopted in the written language for 'money.' Cowries were also traded to Native Americans by European settlers. The sperm whale's tooth, also known as a tambua, was used as money on the Fijian group of

Table sections for systems of weights and measures are usually presented under headings like “units of quantities,” “units of length,” “units of area,” “units of volume,” “units of dry capacity,” “units of liquid capacity” and “units of weight.” As far as possible, I sought to present a simple overview of the units of measurement generally used in each country, well aware that the measurement practice of any nation must be influenced by the customs and practices of its trading partners. To detail “all” varieties would certainly occupy a space manifestly disproportionate to their practical interest, and it is doubtful whether it would provide valuable information or simply contribute to greater confusion, causing an even greater number of errors to occur. The Scottish historians Ian Levitt and Christopher Smout once expressed these thoughts: “Any list that gives local or national standards, however comprehensive and carefully compiled, needs to be used with caution, because slips are easily made, and because such standards could evidently vary in a disconcerting way depending on the period of history and even on districts within countries. Weights and measures are a bramble bush full of good fruit, but no one can come away completely unscratched.”

1 Abkhazia

See also *Georgia*.

This area is partially recognised as an independent state.

islands until the mid-nineteenth century. On Yap, an island in the Caroline Islands of the western Pacific Ocean, stones known as ‘fei’ were used as money until mid-1960s. Indians in northeastern America used the shells of the clam *Venus mercenaria* and other similar bivalves. The shells are mostly white. The scarcer blue-black shells were usually traded at double the price of the white. Last but not least, cows, goats, buffalo, sheep, and camels were used as a primitive money. The cattle were counted by head, thus quantity was more important than quality in this respect.

1.1 Currency

- 2008–: 1 Abkhazian apsar (seldom used)
- 1993–: 1 Russian ruble = 100 kopek

2 Abyssinia

See *Ethiopia*.

3 Achaea

See also *Ottoman Empire* and *Greece*.

Achaea is now the northernmost region of the Peloponnese. The Principality of Achaea (1205–1432), at its zenith, covered most of Morea and Attica in present Greece. It fell to the Ottoman Empire during the mid-fifteenth century, was invaded by Venetians during the late sixteenth century, by the Ottoman Empire again later, and finally became part of Greece in 1821.

Main source: [KRÜG]

3.1 Units of Dry Capacity

For grain in Patras, based on [KRÜG, p. 326]

		Metric
staro		71.839 or 89.799 L
2% or 3	bachel	29.933 L

4 Aceh Sultanate

See also *Sumatra*.

This Kingdom was located in the north of Sumatra, from the coronation of the first Sultan in 1496, until the end of the Aceh War in 1903.

Main sources: [BAUE], [KREE], [MARS], [SNOU], and [SRC]

4.1 Currency

Before 1903

tael, tayell, or tale				
4	pardoh or pardouw			
16	4	mas, meh, or mace		
64	16	4	koepang, coopang, or kapeng	
25,600	6400	1600	400	cash

1 katòë Atjèh = 12 boengkaj = 192 manjam

In Pidië:

1 Spanish dollar = 2 djampaj = 16 goepang = 32 boesō´

In Gajōland:

1 Spanish dollar = 2 djampal = 24 koepang toeö = 40 koepang rēpe = 48 boesoe´ toeö = 80 boesoe´ rēpe

4.2 Units of Length

The measures of length were originally taken from the dimensions of the human body:

1 **deppo** = the span between the extent of the arms from each extremity of the fingers;

1 **etto** = the span between the elbow and the tip of the fingers;

1 **cakee** = a foot;

1 **janca** = a span;

1 **jarree** = the breadth of a finger.

British linked system:

1 **cubit** = ½ yd = 457.2 mm.

4.3 Units of Land Area

1 **yō`** = a piece of land that requires a nalèh of seed.

According to [SNOU], this varied between 1800 and 3500 m².

4.4 Units of Capacity

The Rejang people estimated the quantity of most species of dry commodity. During the early eighteenth century, weights like the **pecul** and the **cattee** were only used along the coast, and at places that the Malays used to visit.

Traditional system for peeled and unpeeled raw rice, based on [SNOU]

											Metric
kuyan^a											1098.72 kg
10	guncha^b										109.872 kg
80	8	katéng or gaténg^c									13.734 kg
100	10	1¼	nalèh								10.987 kg
400	40	5	4	pikōj							2.747 kg
800	80	10	8	2	gantang						1.373 kg
1600	160	20	16	4	2	arè					686.7 g
3200	320	40	32	8	4	2	chupà				343.35 g
6400	640	80	64	16	8	4	2	kay^d			171.67 g
12,800	1280	160	128	32	16	8	4	2	blakay		85.84 g
25,600	2560	320	256	64	32	16	8	4	2	nië or ndië	42.92 g
51,200	5120	640	512	128	64	32	16	8	4	2	put 21.46 g

^aAlso reported as **koyan**

^bAlso reported as **goentja**

^cSometimes reported as one **nalèh**

^dOriginally meaning a coconut shell

Malay-linked system during the late nineteenth century

					Metric
Koyan					2240 kg
5	kuncha				448 kg
50	10	nalèh			44.8 kg
800	160	16	gantang		2.8 kg
3200	640	64	4	chupak	1.4 kg

For cereals and liquids during the late nineteenth century

							Metric	Metric
coyan or coyang							1330.4 kg	1745 L
10	guncha						133.04 kg	174.5 L
38 $\frac{2}{21}$	3 $\frac{17}{21}$	maund^a					34.923 kg	45.8 L
100	10	2 $\frac{5}{8}$	nellie or nelli				13.304 kg	17.45 L
800	80	21	8	coolab, bamboo, or bambou^b			1.663 kg	2.18 L
1600	160	42	16	2	quarter		831.50 g	1.09 L
3200	320	84	32	4	2	chopa, copa, or caul	415.75 g	545 mL

^a[BAUE] reported it as equal to 34.02 kg for rice

^b[BAUE] also reported it as holding 1.662 L of pure water

Other measures reported during the nineteenth century:

1 **parah** (for salt) = 25 bamboos = 41.55 L;

1 **gasay** = the amount of seed that one hand can hold.

4.5 Units of Weight

Traditional system

									Metric
bahar or candil									192.043 kg
200	catty								960.217 72 g
4000	20	buncal							48.010 886 g
12,800	64	3 $\frac{1}{5}$	coyang ^a						15.003 401 g
20,000	100	5	1 $\frac{9}{16}$	tael ^a					9.602 177 g
56,000	280	14	4 $\frac{3}{8}$	2 $\frac{4}{5}$	pagoda				3.429 349 g
64,000	320	16	5	3 $\frac{1}{5}$	1 $\frac{1}{7}$	maxan, miam, or mayon			3.000 680 g
320,000	1600	80	25	16	5 $\frac{7}{7}$	5	mace, meh, or mass ^a		600.14 mg
1,280,000	6400	320	100	64	22 $\frac{1}{7}$	20	4	coopang ^a	150.03 mg

^aUsually also used for gold and silver

Mercantile system, based on [BAUE]

			Metric
bahar			192.064 08 kg
200	catty		960.320 4 g
4000	20	buncal	48.016 02 g

For opium, based on [KREE]

				Metric
katòë				648 g
16	tahé			40.5 g
160	10	tji		4.05 g
1600	100	10	mata	405 mg

For fine use

		Metric
pikōj		64.8 kg
100	katòë Tijna ^a	648 g

^aThe weight of 24 Spanish dollars

For gold and silver until the late eighteenth century

		Metric
marc		246.1 g
9	réal or reel	27.34 g

Other measures:

1 **loxa** or **laxar** = 10,000 sound betel nuts = about 76.2 kg.

Traders usually allowed an extra percentage, often as much as 25%, for unsound nuts.

4.6 Units of Time

Some measures of time:

1 **sì uròë seupōt** = a whole day;

1 **yamam** = 2.4 hours;

1 **tikhan ueroë** or **sikjan uròë** = about 6 hours;

1 **masa' bu sinaléh brenéh** or **matá 'boc tinaléh brenéh** = the time required to cook a naléh of rice = about 3 hours;

1 **masa' bu sigantang brenéh** = the time required to cook a gantang of rice = about 1 $\frac{1}{2}$ hour;

1 **masa' bu sikay brenéh** = the time required to cook a kay (cocoanut shell-full) of rice = about 30 minutes;

1 **chèh ranub sigapu** = the time required to chew a quid of sirih = about 5 minutes;

1 **siklèb mata** = a moment, or the blink of an eye.

Some Malay measures used:

1 **sěmpat makan rokò sa-batang** = the time required to smoke a cigarette;

1 **sà kejap** = the blink of an eye.

5 Acre

See also *Bolivia* and *Brazil*.

The area declared its independence, as the Republic of Acre, from Bolivia in 1899, and was annexed to Brazil in 1903.

6 Aden

See also *Ottoman Empire*, *United Kingdom* and *South Yemen*.

Aden is a seaport, located by the eastern approach to the Red Sea. It was used as a harbour by the Kingdom of Awsan during the fifth, sixth and seventh centuries BC. The region was occupied by the Portuguese and then the Ottoman Empire during the sixteenth century. Later, it was ruled by the Sultanate of Lahey, until 1838, when it became part of British India. In 1937, it became a British Crown colony. From 1967 to the present, the city has been part of Yemen.

The ancient Arabian systems for weights and measures were used well into medieval times. During the late eighteenth century, many measures were linked to the systems used in British India.

Main sources: [ECON], [GBCO2], [MART3], [UN55], and [UN66]

6.1 Currency

1965–1968: 1 South Arabian dinar = 1000 fils

1951–1965: 1 East African shilling = 100 cents

1918–1951: 1 Indian rupee = 16 anna = 192 pies

6.2 Units of Length

British Imperial-linked system

			Imperial	Metric
qama			5½ ft	1.676 4 m
1%	war or yarda		1 yd	914.4 mm
3⅓	2	dra or dira	18 in	457.2 mm

6.3 Units of Area

1 **fadan**, **faddan**, or **dhumd** = an area that could be ploughed by a yoke of oxen in a working day of about 8 hours.

Traditionally reported as about 4 050 m², but during the twentieth century, reported as 1 acre = 4 046.856 4 m².

6.4 Units of Dry Capacity

Dry commodities were generally sold by weight.

British Imperial-linked system for grain

			Imperial	Metric
qadah			200 lbs	90.72 kg
4	keila ^a		50 lbs	22.68 kg
80	20	qasa	2½ lbs	1.134 kg

^aVaried in size from place to place, but according to [GBCO2, p. 147], the volume enclosing 50 lbs av was used most often

6.5 Units of Liquid Capacity

1 **qasa** = ~2.5 L.

6.6 Units of Weight

Traditional system

		Metric
jehn		6.248 kg
10	rahn	624.8 g

1973. Since the late 1970s, Afghanistan has experienced a continuous state of civil war, punctuated by foreign occupations.

British Imperial-linked upper scale, based on [UN66]

						Imperial	Metric
khandi or kandi						672 lbs	304.813 8 kg
$3\frac{9}{25}$	qadah					200 lbs	90.718 4 kg
$8\frac{56}{329}$	$2\frac{142}{7329}$	Imperial maund				82¼ lbs	37.307 942 kg
$13\frac{11}{25}$	4	$1\frac{129}{200}$	keila^a			50 lbs	22.679 6 kg
24	$7\frac{1}{2}$	$2\frac{15}{16}$	$1\frac{11}{14}$	frasila or maund		28 lbs	12.700 576 kg
128	$38\frac{2}{21}$	$15\frac{2}{3}$	$9\frac{11}{21}$	$5\frac{1}{3}$	thamin	5¼ lbs	2.381 358 kg

^aFor grain

British Imperial-linked lower scale, based on [UN66]

						Imperial	Metric
thamin						5¼ lbs	2.381 360 kg
$2\frac{1}{10}$	qasa					2½ lbs	1.133 981 kg
$2\frac{53}{96}$	$1\frac{31}{144}$	seer				2¾ lbs	933.103 54 g
$5\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{2}{35}$	ratl, rattel, or rattle			1 lbs	453.592 37 g
$204\frac{1}{6}$	$97\frac{2}{9}$	80	$38\frac{2}{9}$	tola		180 gr	11.663 803 8 g
$2041\frac{1}{9}$	$972\frac{2}{9}$	800	$388\frac{2}{9}$	10	tia	18 gr	1.166 380 38 g

7 Afghanistan [Formerly: Aryana and Khorasan]

The area was divided into small states until c. 1220. The region was ruled by the Mongol Emperor (c 1220–thirteenth century), divided between local Mongol leaders (mid-thirteenth century–1404), and then became part of the Timurid Empire until 1504. In 1747, the area was united by Ahmed Shah Abdali. The country was, for much of the nineteenth and twentieth centuries, strongly influenced by Britain, which formally recognised its independence in 1921. In 1926, the emirate became a kingdom, but it fell again in 1929 at the time of the Water Boy’s Revolt. The revolt was put down within the year by Mohammed Nadir Khan, who became the new monarch. A republic was established in

The traditional systems for weights and measures were mainly influenced by the Arabic system. Until the early twentieth century, there was no central standard, and each region or city had its own system. The metric system has been compulsory since 1926.

Main sources: [ECON], [HUNT7], [UN54], [UN55], and [UN66]

7.1 Currency

2002–:	1 new afgháni = 100 puli
2001–2002:	1 Rabbini afghani = 100 puli
	1 Dostumi afghani = 100 puli
	1 Shah afghani = 100 puli
1927–2001:	1 afgháni = 100 puli
?–1927:	1 habibi = 3 tilla = 30 rupees = 3000 paise
1881–1927:	1 Kabuli rupee = 2 kran = 3 abbassis = 12 shahis = 60 pice

–1881: 1 Persian qiran = 20 shahi =
 100 dinar
 1 Indian rupee = 16 anna =
 192 pies
 1 Russian ruble = 100 kopeks

7.2 Units of Length

Traditional system, based on [UN54]

			Metric
side of a djarib or gereeb			44.183 m
2	side of a bisvá or beswa		22.091 5 m
4½	2¼	side of a bisvása or beswasa	9.818 4 m

British Imperial-linked system in Kabul

			Imperial	Metric
side of a djarib or djerib			1 740 in	44.196 m
4%	side of a bisvá or beswa		391½ in	9.944 1 m
20	4½	side of a bisvása or beswasa	87 in	2.209 8 m

Other reported measures:

- 1 arshin (for wool) = 1.120 m;
- 1 gazi sha = 42 in = 1.066 8 m;
- 1 arshin (normal) = 1.027 8 m;
- 1 gazi memar = 32 in = 812.8 mm;
- 1 gazi djerib, gazi gareeb, or gazi jerib = 29 in = 736.6 mm;
- 1 gereh gaz sha or gazi sha gereh = 16 gazi sha = 2% in = 66.675 mm.

7.3 Units of Area

Traditional system in Kabul

					Metric
kulba					78 131.5 m ²
40	džaríb, djerib, gereeb, jerib, or jirib				1 953.29 m ²
800	20	bisvá or beswa			97.66 m ²
16,000	400	20	bisvása or beswasa		4.883 m ²
144,000	3600	180	9	gaz gereeb ² or gazi-jerib ²	54.258 dm ²

Metric-linked system during the twentieth century

					Metric
kulba					46,000 m ²
23	džaríb, djerib, gereeb, jerib, or jirib				2000 m ²
460	20	bisvá or beswa			100 m ²
9200	400	20	bisvása or beswasa		5 m ²

7.4 Units of Dry Capacity

Dry commodities were generally measured by weight.

1 artaba (for cereals) = 65.238 L.

7.5 Units of Weight

Traditional system

								Metric
kharvar								447.880 kg
12½	maund							35.830 4 kg
62½	5	seer						7.166 08 kg
100	8	1⅓	man					4.478 8 kg
400	32	6⅔	4	oka				1.119 7 kg
4000	320	64	40	10	khord			111.97 g
100,000	8000	1600	1000	250	25	misqal		4.479 g
9,600,000	768,000	153,600	96,000	24,000	2400	96	wheat grain	46.6 mg

In Kabul during the nineteenth century

								Metric
kharvar								565.280 kg
16	maund							35.330 kg
80	5	seer						7.066 kg
320	20	4	charak					1.766 5 kg
1280	80	16	4	pao, pau, paw, or pow				441.625 g
5120	320	64	16	4	khurd, kourd, or churd			110.406 g
122,880	7680	1536	384	96	24	misqal or methgal		4.600 260 g
2,949,120	184,320	36,864	9216	2304	576	24	nakhod^a	191.678 mg

^aUsually reported as 71/24 grains, but [SIMM] reported it as 259.2 mg

In Kandahar during the nineteenth century

		Metric
kharvar		251.25 kg
40	man^a	6.90 kg

^aAlso reported [RAVE, p. 936] as about 3.5 kg

In Kandahar during the early twentieth century, based on [HUNT7]

				Metric
kharvar				402.4 kg
100	man			4.024 kg
4000	40	seer^a		100.6 g
8000	80	2	misqal	50.3 g

^a1 seer = 8% British Indian tola. 1 tola = 180 Troy grains

In Kabul during the mid-twentieth century, based on [UN66], [FARE, p. 1596] and www.afghanvoice.com

					Metric	Metric	Metric
kharvar					565.28 kg	564.528 kg	580.60 kg
16	maund				35.33 kg	35.28 kg	36.29 kg
80	5	seer			7.066 kg	7.057 kg	7.257 kg
320	20	4	charak		1.766 kg	1.764 kg	1.814 kg
5120	320	64	16	khord	110.41 g	110.28 kg	111.97 g

8 Ajman

See *United Arab Emirates*.

Ajman's first act as an autonomous entity was entering into a treaty with Britain in 1820, along with Abu Dhabi, Dubai, Sharjah and Umm al-Quwain, to form the Trucial States. In 1971, Ajman became one of the six original members of the United Arab Emirates.

8.1 Currency

1967–1971: 1 riyal = 100 dirhams

1964–1967: 1 rupee = 100 naye paise

weighing the gold dust, but so were salt and merchandise. The same weight-standard is used in present-day Ghana and Ivory Coast. All amounts below 1.4 grams were weighed with seeds and amounts from 1.4 grams upwards with metal weights, usually made of an alloy whose composition was similar to that of brass and bronze. The metal weights are miniature representations of various items well known in the Akan cultural environment these days, such as adinkra symbols, geometric figures, plants, animals and people. The Akan systems of weights consisted of three series of weights.

Larger weight series

	ba	Metric
pereguan	478	71.92 g of gold
banna	432	67.44 g of gold
banda	384	56.80 g of gold

9 Akanland

See also *Asante Empire, Ghana and Ivory Coast*.

In what is now part of Ghana and the Ivory Coast, there were 33 independent Akan states in the early seventeenth century.

Main sources: [DEMA2], [GARR], [GLUC], [JUST], [NIAN], [SALE4], [SAVA2], and [ZELL]

9.1 Units of Weight

Well before their first contact with Portuguese and Dutch traders, the Akan people of West Africa, such as the Abe, Adiukru, Agona, Akyem, Anyi, Aowin, Asante, Assin, Atie, Baule, Bono, Brong, Ebrie, Fanti, Gyaman, Kwahu, Nzima, Sefwi, Twifo, Wassa and other related groups, used gold dust as a medium of exchange. Standard weights were used for

Medium weight series

	Monetary value
tyasue	5
anan	5
gua	5
Anui	5
tya	5
gbangbandia	4
assan	4

Each of these seven units comprises five monetary values.

gua-series

					ba	Metric
guagnan					192	28.40 g of gold
2	gua				96	16.20 g of gold
4	2	tra			48	7.54 g of gold
8	4	2	adjratchui		24	3.55 g of gold
16	8	4	2	météba	12	1.77 g of gold

Smaller weight series, used for small transactions

									Metric
babrou									1.480 g of gold
–	bamotchué								1.184 g of gold
–	1½	banzo							1.036 g of gold
1⅓	1⅓	1%	banzien						0.888 g of gold
2	1⅓	1%	1½	banou					0.740 g of gold
2½	2	1¼	1½	1¼	banan				0.592 g of gold
3⅓	2⅔	2½	2	1⅓	1½	bansan			0.444 g of gold
5	4	3½	3	2½	2	1½	bagnon		0.296 g of gold
10	8	7	6	5	4	3	2	ba	0.148 g of gold

Timothy F. Garrard did a tremendous job of interviewing people from various Akan sub-groups, who, during childhood, had used or heard of gold weights. Below, I have compiled some of those results.

Adansi system, based on [GARR, pp. 346–347]

	Value
ntansa	£24
pereguan tasuanu	£20
ntaanu esiabo mienu	£18 12s
ntaanu	£16
pereguan asia	£9 6s
pereguan	£8
bennaa	£7
asuasa	£6
asuanu ne nsano	£4 13s
asuanu	£4
osua ne somma	£2 8s
osua	£2
dwoa	Value forgotten
asia or esiabo	£1 6s
suduo ne dommafa	£1 4s
suru	£1
nsano ne soafa	16s
nsano	13s
nsoansa	10s

(continued)

	Value
domma	8s
dommafa	4s
takuo nsia or soafa	3s
taku anum	2s 6d
taku anan	2s
taku miensa	1s 6d
taku miensu or kokwa miensa	1s
kokwa mienu	9d
taku	6d
kokwa	4d
sempowa	3d
damma	2d
pesewa	1d
powa	½d

Akyem system, based on [GARR, p. 347]

	Value
ntansa	£24
ntaanu	£16
tasuanu	£12
pereguan asia	£9 10s
pereguan	£8
bennaa	£7
asuasa	£6
asuanu ne dwoasuru	£4 18s

(continued)

	Value
asuanu	£4
nnwoa mienu	£3 12s
osua ne suru	£3
osua ne domma	£2 8s
osua	£2
dwoa	£1 16s
asia	£1 10s
suru ne dommafa	£1 4s
suru	£1
dwoasuru	18s
nnomanu	16s
nsano	13s
nsoansa	10s
agyiratwe	9s
domma	8s
fiaso	6s 6d
soa	6s
dommafa	4s
fiasofa	3s 3d
soafa	3s
taku	6d
kokoa	4d
takufa	3d
damma	2d
pesewa	1d

Aowin system, based on [GARR, pp. 351–352]

	Value
ndalae nsa	£18
ndalae	£12
pereguan asia	£9 7s
pereguan	£8
bennaa	£7 2s
djua nsa or ta	£6
atape bandiesue	£4 13s
atape	£4
anui nyo	£3
esua domma	£2 8s
esa nyo	£2 4s
djua	£1 16s 6d
anlui or anui	£1 10s
etea	£1 7s
Name forgotten	£1 4s 6d
esa	£1 2s
bale	£1
simale or samale	18s
talae	16s

(continued)

	Value
bandiesue	13s
tuabo	11s
nsoansa	10s
agyirawotwe	8s 6d
nso nsa or edoma	8s
esoa	6s 9d
meteba	4s 6d
ba nso	2s 6d
ba nsyi	2s 3d
ba nu	2s
ba na	1s 6d
ba nsa	1s 3d
bae	9d
dei or ba n'damma	6d
sempowa	3d
damma	2d

Asante system, based on [GARR, pp. 348–349]

	Value	Metric
mpereguan anum	£40	
mpereguan anan	£32	
ntansa	£24	
ntaanu esiabo mienu	£18 12s	
ntaanu or pereguan mienu	£16	
pereguan asia	£9 6s	
pereguan	£8	
bennaa or asuasa ne suru	£7	
asuasa	£6	
asuanu ne suru	£5	
abuanu ne nsano	£4 13s	
asuanu	£4	
osua ne suru	£3	
osua ne domma	£2 7s	
osua pa	£2	
onansua	£1 16s	
onamfi	£1 12s	
dwoa	£1 10s	
asia	£1 6s	
techimansua	£1 3s 6d	
peresuru	£1 2s	
suru pa	£1	
bremanansuru	17s	
anamfisuru	16s	
dwoasuru	15s	
nsano	13s	
nnomanu	12s	
bodommo	11s	
nsoansa	10s	

(continued)

	Value	Metric
agyiratwe	9s	
borofa (called domma at the coast)	8s	
domma	7s	
soa	6s	
bodommofa	5s 6d	
nsoansafa	5s	2.30 g
agyiratwefa	4s 6d	
brofa	4s	1.85 g
fiasofa or dommafa	3s 6d	
sofa ^a	3s	1.39 g
ntaku anum	2s 6d	
ntaku anan	2s	0.70 g
ntakuo miensa	1s 6d	0.57 g
ntakuo mienu	1s	0.35 g
nkoko mienu	9d	0.33 g
taku	6d	0.22 g
kokoa	4½d	0.16 g
sempowa or takufa	3d	0.11 g
damma ^b	2d	0.08 g
pesewa ^c	1d	0.04 g
powa or powa hu ^d	½d	0.02 g
mo aba ^c	1/3d	0.013 g

^aThe smallest metal weight

^bA red and black seed of the *Abrus precatorius*

^cA dark blue *Rhynchosia* seed

^dThis was a rarely mentioned measurement, and could not be regarded as an actual weight

^eReported as a grain of rice, but with only a notional value, and subsequently not regarded as an actual weight

Assin-Fosu system, based on [GARR, pp. 345–346]

	Value
mpereguan anum	£40
ntansa	£24
ntaanu esiabo mienu	£18 14s
ntaanu or pereguan mienu	£16
tasuanu	£14
pereguan asia	£9 7s
pereguan	£8
bennaa	£7
asuasa	£6
asuanu dwoasuru	£4 18s
asuanu	£4
osua ne suru ne bodommo	£3 11s
osua ne suru	£3
osua ne domma	£2 8s
osua	£2
asia ne soa	£1 13s

(continued)

	Value
dwoa	£1 10s
asia	£1 7s
suru ne dommafa	£1 4s
peresuru	£1 2s
suru	£1
dwoasuru	18s
nsano soafa	16s
nsano	13s
nsoansa ntaku anan	12s
bodommo	11s
nsoansa or domma ntaku anan	10s
agyiratwe	9s
domma	8s
soa or asensua	6s
agyiratwefa	4s 6d
dommafa	4s
soafa	3s
takuo anan	2s
takuo miensa	1s 6d
sempowa miensa	9d
taku or takufa	6d
kokwa	4d
sempowa	3d
damma	2d

Brong-Ahafo system, based on [GARR, pp. 349–350]

	Value
pereguan anum	£40
ntansa	£24
ntaanu asuanu	£20
ntaanu esiabo mienu	£18 12s
ntaanu	£16
tasuanu	£12
pereguan asia	£9 6s
pereguan	£8
asuasa ne suru	£7
asuasa	£6
asuanu ne suru	£5
asuanu nsano	£4 13s
asuanu	£4
sua domma	£2 7s
esiabo mienu	£2 12s
sua	£2
techimansua	£1 17s
onansua	£1 16s
onamfi	£1 13s
dwoa	£1 10s
asia	£1 6s

(continued)

	Value
takimansua	£1 5s
peresuru	£1 2s
suru	£1
namfisuru	Value forgotten
nnomanu	14s
nsano	13s
bodoma	Value uncertain
nsoansa	10s
agyiratwe	9s
borofa	8s
domma	7s
soa	6s
nsoansafa	5s
agyiratwefa	4s 6d
domafa	3s 6d
soafa	3s
taku	6d
kokwa	4d
sempowa	3d
damma	2d
pesewa	1d
powa	½d

Denkyira-Bremang system, based on [GARR, pp. 343–344]

	Value
pereguan asia	£9 6s
pereguan	£8
bennaa	£7
asuasa	£6
asuanu nsano	£4 13s
asuanu	£4
osua ne domma	£2 8s
osua	£2
takimansua or onansua	£1 15s
anamfi	£1 14s
dwoa	£1 10s
asia	£1 6s
peresuru	£1 2s 6d
suru or sudu	£1
nansuru	18s
ananfisuru or nnomanu	16s
dwoasuru	15s
nsano	13s
bodommo	11s
nsoansa	10s
agyiratwe	9s

(continued)

	Value
edomma	8s
fiaso	7s
esoa	6s
brofa	4s 6d
dommafa	4s
taku	6d
damma	2d
pesewa	1d

Fanti system, based on [GARR, p. 341]

	Value	Metric
ntansa	£24	
ntaanu	£16	
bende ebien	£14	
pereguan	£8 2s	
banda or bende	£7 4s	62.027 g (2 troy ounces)
bennaa	£7	
asuasu	£6 1s 6d	
ejua miensa	£5 8s	
asuanu	£4 2s	
ejua mienu or jua abien	£3 12s	31.103 g (1 troy ounce)
sua na suru	£3 1s	
sua ne dumba	£2 8s	
sua	£2 1s	
ejua	£1 16s	
kanjua	£1 10s or £1 14s	
esia	£1 7s	
suru ne dommafa	£1 4s	
piresuru	£1 2s 6d	
juasuru	18s	
nsan	13s 6d	
bodumbo	11s	
agyiratwe or agyirawotwe	9s	
dumba	8s	
brambalambo	6s 6d	
name forgotten	6s	
dadaako or metua	4s 6d	
dumbafa	4s	
ntaku miensa	2s 3d	
sempowa miensa	9d	
takufa	6d	
asamankamu	4d or 5d	
sempowa	3d	
damba^a	2d	140 mg
pesewa	1d	

^aThis is equal to the weight of a grain from *Abrus precatorius*

Nzima system, based on [GARR, p. 352]

	Value
epeleguane	£8
bennaa	£7 4s
anla nsa	Value forgotten
edeazue or asua	£2
bale	£1
simala	18s
tranye	16s 6d
bandeazue	13s 6d
nzoanza	Value forgotten
egyalawotwe or agyratwe	9s
edoma	8s
esoba or esoa	6s 9d
nzu nwio	Value forgotten
meteba or metaba	4s 6d
eteku nsia	2s 3d
eteku na	1s 6d
maa za	1s 3d
maa nwio	9d
eteku	6d
sempowa	3d
edema or elama	2d
kpesaba or kpesewa	1d

Sefwi system, based on [GARR, pp. 350–351]

	Value
ntansa	£24
ntaanu esiabo mienu	£18 12s
ntaanu	£16
pereguan asia	£9 6s
pereguan	£8
bennaa	£7
asuasa	£6
asuanu ne nsano	£4 13s
asuanu	£4
esua ne suru	£3
osua ne domma	£2 8s
sua	£2
takimansua	£1 15s
dwoa	£1 10s
asia	£1 6s
mpresuru	£1 2s
suru	£1
nsano suafa	16s 6d
bandeasue or nsano	13s
bodommo	11s
nsoansa or eduma taku anan	10s
agyratwe	9s

(continued)

	Value
domma	8s
bodommafa	5s 6d
nsoansafa	5s
agyratwefa	4s 6d
edommafa	4s
taku anan	2s
taku miensa	1s 6d
ba nsa	1s 3d
ba nyo	9d
de or taku	6d

Twifo system, based on [GARR, pp. 342–343]

	Value
mpereguan anum	£40
mpereguan anan	£32
ntansa	£24
ntaanu	£16
pereguan asuasa or bennaa mienu	£14
pereguan asuanu	£12
pereguan osua	£10
pereguan asia	£9 7s
pereguan	£8
bennaa	£7
asuasa	£6
asuanu ne suru	£5
asuanu ne nsano	£4 13s
asuanu	£4
bennaafa	£3 10s
osua ne suru	£3
osua ne nsano	£2 13s
osua ne domma	£2 8s
osua	£2
nansua	£1 14s
namfi	£1 12s
dwoa	£1 10s
asia	£1 7s
sudu dommafa	£1 4 s
peresuru	£1 2s 6d
suru	£1
nansuafa	18s
namfisuru	16s
dwoasuru	15s
nsano	13s
nnomanu	12s
bodommo	11s
nsoansa	10s
agyratwe	9s
domma	8s

(continued)

	Value
fiaso	7s
soa	6s
bodommofa	5s 6d
nsoansafa	5s
agyiratwefa	4s 6d
dommafa	4s
fiasofa	3s 6d
soafa ^a	3s
nkoko asia ^b	2s 6d
nkoko anum ^c	2s
nkoko anan or ntaku miensa	1s 6d
nkokwa miensa ^d	1s 3d
nkokwa mienu	1s
kokwa n'damma	9d
kokwa or taku	6d
damma	2d
pesewa	1d
powa	½d
mo aba ^c	1/3d

^aThe smallest metal weight

^bEqual to six seeds

^cEqual to five seeds

^dEqual to three seeds

^eReported to equal the weight of a grain of rice, but not regarded as an actual weight

Wassa-Amenfi system, based on [GARR, pp. 344–345]

	Value
ntaanu	£16
pereguan asia	£9 7s
pereguan	£8
bennaa	£7
asuasa	£6
asuanu ne nsano	£4 13s
asuanu	£4
sua ne domma	£2 8s
osua or sua	£2
onamfi	Value forgotten
asia	£1 7s
peresuru	£1 2s
suru	£1
anamfisuru	16s
nsano	13s
nsoansa	10s
agyiratwe or agyirawotwe	9s
domma	8s
brofa	4s 6d

10 Akwa Akpa [Formerly: Old Calabar and Duke Town]

See also *Nigeria*.

Main source: [RUGG]

10.1 Units of Length

1 covado = 577.5 mm.

10.2 Units of Liquid Capacity

1 kruh or tabb = 10 old English wine gallons = 37.854 L.

11 Albania

See also *Ottoman Empire*.

This region was a province of the Roman Empire, then of Byzantium in 395, before falling to the Normans, Goths, Venetians, Serbs, Bulgari, and Turks. Albania was autonomous between 1443 and 1467, when it became part of the Ottoman Empire. An independent Albania was proclaimed in 1912. In 1914, it became a principality, in 1925, a republic, and in 1928, a kingdom. In 1939, it was united with the Italian Crown, but once again became independent in 1944.

The famous Greek historian and geographer Strabo (c.63 BCE–c. 24 CE) wrote that the Albanians were unacquainted with weights, measures, and the use of money, that they could not count above one hundred, and that trade was carried on among them only through exchange.

The metric system has been compulsory since April 19, 1951.

Main sources: [BELD2], [INAL], [MART3], [SALE2], and [UN55]

11.1 Currency

1926–:	1 Albanian lek = 100 qindarka or qindar leku
1925–1926:	1 Albanian franga or frang ar = 100 qindar ari
1912–1925:	1 French franc = 100 centimos 1 Italian lira = 100 centesimo 1 Greek drachma = 100 lepta
1881–1912:	1 piastre = 40 para
–1881:	1 lira = 16⅔ altilik = 20 beshlik = 33⅓ uechlik = 40 yuzluk = 50 ikilik = 100 piastres = 4000 paras = 10,000 minas = 12,000 aspers

11.2 Units of Area

1 dönüm = 918.7 m².

11.3 Units of Dry Capacity

1 kilo (for grain, legumes, and seeds at Avlona, present-day Vlorë, during the late nineteenth century) = 90.232 5 L.

11.4 Units of Liquid Capacity

For oil at Avlona, present-day Vlorë, during the late nineteenth century

		Metric	Metric
salma		162.971 L	147.312 kg
10	Staio	16.297 1 L	14.731 2 kg

11.5 Units of Weight

For grain during the fourteenth century

			Metric
large kabal ^a			180.04 kg
10	small kabal		18.004 kg
140	14	okka	1.286 kg

^aAlso reported as 144 okka = about 185.2 kg

For charcoal in northern Albania during the fourteenth century

				Local relations	Metric
large hiyaça or hiçe					597.456 kg
2	small hiyaça or hiçe				298.728 kg
6	3	himl or hyças		77 okka and 140 dirhem	99.576 kg
24	12	4	kıbil or kabal	19 okka and 135 dirhem	24.894 kg

During the fourteenth–seventeenth centuries

						Metric
brasse ^a						2,388,946 kg
–	moz ^b , iml, or yük					205.280 kg
–	1⅓	bar or barrë				153.936 kg
–	2	1½	karta			102.640 kg
–	5	3¾	2½	muzer		41.056 kg
1 862	160	120	80	32	okka	1.283 kg

^aUsed for wood

^bFormerly reported as 3 karta

During the late fourteenth century

			Metric
istatra or ustatra			225.772 kg
176	okka		1.283 kg
400	2⅔	lodra	564.4 g

For wheat at Avlona, present-day Vlorë, during the late nineteenth century

			Metric
kiasseh			56.365 603 kg
2⅓	tagari		25.620 729 kg
44	20	okka	1.281 kg

In Berat during the mid-nineteenth century

		Metric
okka		1.601 295 kg
500	dirhem	3.202 6 g

11.6 Units of Weight

At Iskodra, present-day Shkodër, in 1520 and 1536

	oka	Metric		oka	Metric
kile		102.535 kg	kile		46.285 kg
80	oķka	1.282 kg	36	oķka	1.285 7 kg

- 1 pataca gouda or pataca gorda = 3 patacas chicas = 24 teminas = 696 aspers
- 1 pataca chica = 8 tomins = 232 aspers
- 1 saime or dobla = 50 aspers
- 1 karub = 14 aspers

Coins previously used in the area: budju, dinar, dirham saghir, mangir, mazuna, sultani, and zeri mahbub.

12 Algeria

See also *Byzantine Empire* and *Ottoman Empire*.

Coastal Algeria was controlled by the Carthaginians (seventh century BCE–202 BCE), the Roman Empire (until the fifth century), the Vandals (during the fifth century), the Byzantine Empire, the Arabs, Barbary pirates, and the Ottoman Empire (c 1516–1830). Spanish enclaves were established from the early sixteenth century until the late eighteenth century. The region was controlled by France starting in 1830 and was annexed to France in 1842–1848. Independence was proclaimed in 1962.

The metric system has been officially used since March 1, 1843. Some sources² say since 1845.

Main sources: [DECO2], [DUBO], [DOUR], [JOUF], [KAHN], [KELL], and [MART3]

12.1 Currency

- 1964–: 1 Algerian dinar = 100 centimes
- 1959–1964: 1 nouveau Algerian franc = 100 centimes
- 1848–1959: 1 Algerian franc = 100 centimes
- 1830–1848: 1 Algerian dinar = 100 centimes
- 1830: 1 Algerian budju or rial budchu = 24 munzunas = 48 karubs

During the late eighteenth century:

- 1 sequin = 10 patacas chicas = 2 320 aspers
- 1 sultanin = 8½ patacas chicas = 1 972 aspers

12.2 Units of Length

Traditional system

						Metric
dohar						4446.0 m
3	mil					1482.0 m
8980	2993⅓	dhra or pik				495.10 mm
17,960	5986⅔	2	nus			247.55 mm
35,920	11,973⅓	4	2	rebia		123.775 mm
71,840	23,946⅔	8	4	2	termin	61.887 5 mm

Other reported measures:

- 1 farsech = 244.0 m.

For fabrics

				Metric
pic turco, pic o zerà a chebir, or dhra á torky^a				636.0 mm
1⅓	pic arabo, pic o zerà a sogher, or dhra á raby^b			477.0 mm
8	6	robi		79.5 mm

^aThe Turkish pic used for silk and cloth
^bThe Moorish pic used for linen

12.3 Units of Area

There were no agrarian measures.

²[BROW9, p. 178].

12.4 Units of Dry Capacity

Traditional systems, two reported scales

				Metric	Metric
caffiso, caffise, cafiz, or calisse				319.584 L	317.4 L
5½	saa, saah, saha, or ssah			58.106 L	57.7 L
6⅔	1⅓	psa		48.421 L	48.1 L
16	2 ¹⁰ / ₁₁	2 ¹⁴ / ₃₃	tarri, tarrier, terrie, or tarie	19.974 L	19.8 L

British Imperial-linked system

				Imperial	Metric
caffiso, caffise, cafiz, or calisse				9 bu	317.15 L
8	saa, saah, saha, or ssah			1⅛ bu	39.64 L
16	2	tarri, tarrier, terrie, or tarie		9/16 bu	19.82 L

Metric-linked system in Algiers and Oran

					Metric
tupsia, tuptia or tultia					480 L
4 ¹² / ₁₇	fanega				102 L
8	1 ⁷ / ₁₀	saa, saah, saha, or ssah			60 L
10	2⅞	1¼	psa		48 L
24	5 ⁹ / ₁₀	3	2⅔	tarri, tarrier, terrie, or tarie	20 L

Metric-linked system in Constantine

				Metric
tupsia, tuptia or tultia				480 L
4	saa, saah, saha, or ssah			120 L
10	2½	psa		48 L
24	6	2⅔	tarri, tarrier, terrie, or tarie	20 L

12.5 Units of Liquid Capacity

Traditional system and metric-linked system

				Metric	Metric
caffiso, cafiz, or calisse				317.104 L	320 L
6⅔	saa, saah, or ssah			47.566 L	48 L
16	2⅔	tarri or tarie		19.819 L	20 L
19⅓	2 ²⁷ / ₂₅	1⅓	kolleh, kulla, or khoullé^a	16.516 L	16⅔ L

^aThe metric-linked **khoullé**, **khoull**, **khoull**, **kulla**, or **khollah** = 16 or 16⅔ L. Fractions of a khoullé (1/2, 1/4, 1/8, etc.) were also in use until the late nineteenth century

Other reported measures:

1 **metallo** (for oil) = about 17.90 L, but usually 16.961 kg. According to [KELL] = 16.951 kg.
1 **hollah** = 16.67 L.

12.6 Units of Weight

For medical use

				Metric
quintal attari^a				60.060 kg
1 $\frac{1}{10}$	kantar attari			54.600 kg
110	100	ratl attari		546 g
1760	1600	16	once	34.125 g

^aAlso reported as 69.069 kg

For flax and linen in Algiers during the early nineteenth century, based on [MART3], [KELL] and [DOUR]

		Metric	Metric	Metric
cantaro		109.216 kg	107.940 kg	100.764 kg
200	rottölo attári	546.08 g	539.70 g	503.82 g

For butter, dates, figs, fruits, honey, oil, raisins, and soap in Algiers during the early nineteenth century, based on [MART3], [KELL] and [DOUR]

		Metric	Metric	Metric
cantaro		90.649 28 kg	89.590 kg	83.634 kg
166	rottölo attári	546.08 g	539.70 g	503.82 g

For lead, iron, and wool in Algiers during the early nineteenth century, based on [MART3], [KELL] and [DOUR]

		Metric	Metric	Metric
cantaro		81.912 kg	80.955 kg	75.573 kg
150	rottölo attári	546.08 g	539.70 g	503.82 g

For almonds, cheese, and cotton in Algiers during the early nineteenth century, based on [MART3], [KELL] and [DOUR]

		Metric	Metric	Metric
cantaro		60.068 8 kg	59.367 kg	55.420 kg
110	rottölo	546.08 g	539.70 g	503.82 g

For brass, bronze, copper, drugs, and wax in Algiers during the early nineteenth century, based on [MART3], [KELL] and [DOUR]

		Metric	Metric	Metric
cantaro		54.608 kg	53.970 g	50.383 kg
100	rottölo attári	546.08 g	539.70 g	503.82 g

For lead, wool, oil, and honey during the late nineteenth century (officially until 1843), based on [MART3]

			Metric
cantaro kébir or cantaro kebyr			81.912 kg or 92.151 kg ^a
100	rottölo kébir or rottölo kebyr		819.12 g or 921.51 g ^a
2400 or 2700	24 or 27	wakea or ukkia	34.13 g

^aValues reported by [NOBA]

For fruits and fresh vegetables during the late nineteenth century (officially until 1843), based on [MART3]

			Metric
cantaro grédouri or cantaro khaldary			61.434 kg
100	rottölo grédouri or rottölo khaldary		614.34 g
1800	18	wakea or ukkia	34.13 g

For spices and drugs during the late nineteenth century (officially until 1843), based on [MART3]

				Metric
cantaro attari or cantaro thary				54.608 kg
100	rottölo attari or rottölo thary			546.08 g
1600	16	wakea or ukkia		34.13 g
12,800	128	8	drahem	4.266 g

Some other relations

						Metric
cantar kebyr						819.12 kg
29/4	cantar khaldary					61.434 kg
116	16	cantar thary				54.608 kg
261/2	18	9/8	rottolo kebyr			819.12 g
174	24	1½	1⅓	rottolo khaldary		614.34 g
11,600	1600	100	800/9	200/3	rottolo thary	546.08 g

For silver during the mid-nineteenth century, two reported scales

			Metric	Metric
roṭl feuddi or roṭl fedhi			497.435 g	497.521 g
16	wakea, ukkia, or uchiah feuddi		31.090 g	31.095 g
106⅔	6⅔	mitkal, metsquat, or métikal	4.663 45 g	4.664 26 g

For silver during the early twentieth century

			Metric
roṭl feuddi or roṭl fedhi			494.885 g
14½	wakea, ukkia, or uchiah feuddi		34.130 g
105⅞	7¼	mitkal, metsquat, or métikal	4.707 59 g

For gold, pearls, and diamonds, in Algiers, as reported during the early nineteenth century and early twentieth century

		Metric	Metric
mitkal, metsquat, or métikal^a		4.663 45 g	4.707 59 g
24	kharub, karoube, or karrouba (carob seed)	194.3 mg	196.1 mg

^aAt El Oued = 4.17 g, and at Eegdezi = 4.27 g. According to [KELL], 1 **métikal** (for gold, silver, pearls, and diamonds) = 4.745 g

Other reported measures:

1 **balle** (for flour in Constantine) = 122.50 kg;

1 **rotolo** (in Oran) = 503.758 g.

The metric system is now used along with the customary U.S. system.

13.1 Currency

1904–: 1 US dollar = 100 cents

13 American Samoa (Territory of American Samoa)

These islands were discovered by the Dutch explorer Jacob Roggeveen in 1722. After years of rivalry during the early nineteenth century, Germany and the U.S. divided the Samoan archipelago between themselves in 1899. Today, the eastern part of the archipelago, known as American Samoa, is an unincorporated territory of the United States.

14 Andaman Islands

See also *Nicobar Islands*.

In 1788, the British rule in Bengal started to investigate the possibility of establishing a penal colony on the islands, and in 1789, they founded Port Cornwallis. But many died of diseases, and

in 1796, the islands were abandoned by the British. In 1857, the British again tried to establish a colony on the islands and chose to put the city in the same place as the former Port Cornwallis, with the new name of Port Blair. During World War II, the islands were occupied by Japan. After the war, they once again came under British control. In 1947, together with the Nicobar Islands, most of the islands became part of the Andaman and Nicobar Islands Union Territory of India.

The English system for weights and measures was in use well into the late twentieth century.

Main sources: [MAN] and [MATH2]

14.1 Units of Length

The aboriginal inhabitants had no recognised standard of measures corresponding to the nail, finger-joint, thumb, span, or pace. When speaking of shorter distances, they would compare it to a bowshot, and any distance over 24 km was said to exceed a day’s journey.

14.2 Units of Capacity

For expressing capacity, they said “a basketful,” “a bucketful,” “a handful,” or “a canoe-load,” as the case might be.

14.3 Units of Weight

In referring to the weight of a small object, they usually compared it to some seed, such as that of *Entada pursaetha*, or a fruit, such as mangosteen, jackfruit, or cocoanut. Larger weights were said to be “as much as” or “more than one man could carry” or “lift.” According to [MAN, p. 116], the maximum of a man’s burden was about 40 lbs = about 18 kg.

15 Andorra

In 843, the Emperor Charles II appointed the Count of Urgel as overlord for the Valleys of Andorra. From this family, the rights passed to the French Comte de Foix, with whom, by the Paréage of 1728, the Catalan Bishop of Urgel was made joint suzerain. Today, sovereignty is shared between the president of the French Republic and the Bishop of Urgel.

The metric system has been used since the early twentieth century.

15.1 Currency

1999–:	1 Euro = 100 euro-cent
1986–2002:	1 diner = 125 Spanish pesetas = 12,500 centimos
	1 French franc = 100 centimos
1983–1985:	1 Andorra diner = 100 pesetas
–1983:	1 Andorra diner = 100 cèntims

Coins previously used in the area: centime and sovereign.

15.2 Units of Length

1 canes = 1.547 m.

15.3 Units of Area

			Metric
quartera de sembradura or journal			2229.04 m ²
25	cavallon		89.161 6 m ²
900	36	canes ²	2.476 7 m ²

15.4 Units of Dry Capacity

			Metric
carga			144 L
8	mesure		18 L
32	4	lliure	4.5 L

15.5 Units of Liquid Capacity

Mainly used for wine

			Metric
carga			121.40 L
4	barralon		30.35 L
128	32	porrón	948.44 mL

15.6 Units of Weight

				Metric
carga or càrrega				124.80 kg
3	quintare			41.6 kg
12	4	rove		10.4 kg
312	104	26	lliure	400 g

16 Anglo-Egyptian Sudan

See *Sudan*.

17 Angola

See also *Cabinda* and *Portugal*.

This area was discovered by the Portuguese navigator Diogo Cao in 1482. The Portuguese established coastal settlements starting in 1491. The Dutch occupied Luanda from 1641 to 1648. The region was restored to Portugal by 1650. Portuguese Congo, also known as Cabinda, became part of Angola in 1972. Angola gained its independence in 1975.

The metric system has been used since 1905, and became compulsory in 1910.

Main sources: [MART3], [UN55], and [UN66]

17.1 Currency

- 1999–: 1 Angolan kwanza = 100 cêntimos
 1995–1999: 1 kwanza reajustado
 1990–1995: 1 novo Angolan kwanza
 1975–1998: 1 Angolan kwanza = 100 lwei
 1958–1977: 1 Angolan escudo = 100 centavos
 1 Angolan kwanza = 100 cêntimos
 1928–1958: 1 Angolan angolar = 20 macutas = 100 centavos
 1914–1928: 1 Angolan escudo = 20 macutas = 100 centavos
 1861–1911: 1 Angolan real ; 1 macuta = 50 réis
 1762–1861: 1 Angolan real ; 1 macuta = 40 réis
 1693–1762: 1 Portuguese milréis = 1000 réis
- Eighteenth century: 1 simbo = oliva nana shell
 cowries and bunches of salt
 1 bondo = 5 cofos or kévis = 10 lufukas = 50 makutas = 100 fundas = 100,000 cowries
- Eighteenth century: little discs of *Achatina balteata* (a type of snail shell) were used as currency along the coast from Senegambia to Benguella and discs from *Achatina moneteria* were used in the district inland from Mosamedes.
- Eighteenth century: 1 quiranda or kirana = 6 dongo
 1 dongo = a snailshell disk used as currency in the Kwanza district.
- Seventeenth century: 1 tukula = a piece of red wood (in the Lovando area)
 1 simbo = a snailshell (in the Lovando area)
 1 libongo or pano-simbo (cloth)

17.2 Units of Length

Dutch-linked system during the seventeenth century

			Metric
vadem			1.7 m
6	voet		283.3 mm
66	11	vinger	2.57 mm

Portuguese-linked system during the seventeenth century

			Metric
côvado			657 mm
3	palmo or span		219 mm

Some other measures reported during the nineteenth century:

- 1 **jactam** (for cloth) = 3.659 m;
 1 **côvado** or **cobido** (in Luanda) = 577.50 mm.

17.3 Units of Dry Capacity

Some reported measures:

- 1 **fanga** (in Luanda) = 55.363 200 L.

17.4 Units of Liquid Capacity

Various measures reported during the seventeenth–nineteenth centuries:

- 1 **cazunguela** (in Luanda) = 13.840 800 L;
 1 **mengel** = 1.2 L.

17.5 Units of Weight

Dutch-linked system during the seventeenth century

			Metric
last			1 976 kg
4 000	pond		494 g

For gold

				Metric
benda				64.113 g
2	benda offa			32.056 g
8	4	usano		8.014 g
128	64	16	aki ^a	500.88 mg

^aAlso reported as 550 mg or 850 mg

Some measures reported during the twentieth century:

- 1 quintal or quintal metrique = 100 kg;
 1 saco or sacco (for maize) = 90 or 95 kg;
 1 saco or sacco (for beans) = 50 or 90 kg;
 1 saco or sacco (for rice) = 71 kg;
 1 saco or sacco (for coffee) = 61 kg.

18 Anguilla

See also *United Kingdom*.

Anguilla was discovered by Christopher Columbus in 1493 and became a British colony in 1650. In 1882, Anguilla was united with Saint Kitts and Nevis in the Leeward Island Federation. The Federation of the West Indies was established in 1958, and included Anguilla, Antigua, Trinidad & Tobago, Jamaica, Barbados, Dominica, Grenada, St. Lucia, St. Vincent, St. Kitts, Nevis, Montserrat, the Cayman Islands and Turks & Caicos. The Federation of the West Indies lasted until 1962. In 1967, Anguilla was politically joined with St. Christopher and Nevis to form a British associated state. In 1971, Anguilla broke from the Leeward Island Federation, and in 1980, it became an overseas territory of the United Kingdom.

18.1 Currency

- 1961–: 1 East Caribbean dollar = 100 cents
 1935–1961: 1 British West Indies dollar = 100 cents
 1825–1935: 1 US dollar = 100 cents
 1 pound sterling = 200 shillings
 = 240 pence = 960 farthings

19 Annam Protectorate

See also *Cambodia, Cochinchina, France, French Indochina, Laos, Paracel Islands and Tonkin.*

This region was a protectorate of France from 1874 until 1955. It is now a part of Vietnam.

Measures varied from one district to another, as there was no general standard before metrification. By an ordinance of 1872, units were defined in terms of the metric system.

Main sources: [CARD], [MART3], [TABE], and [UN55]

19.1 Units of Length

Traditional system, based on [TABE]

							Metric
mẫu							73.089 000 m
10	sào						7.308 900 m
30	3	ngũ					2.436 300 m
150	15	5	thước^a				487.260 mm
1500	150	50	10	túc			48.726 mm
15,000	1500	500	100	10	phân		4.872 6 mm
150,000	15,000	5000	1000	100	10	ly	487.26 µm

^aFor maritime use, reported by [MART3] as 420.00 mm

For field measuring, based on [TABE]

							Metric
mẫu							80.397 900 m
10	Sào						8.039 790 m
165	16½	thước					487.260 mm
1650	165	10	túc				48.726 mm
16,500	1650	100	10	phân			4.872 6 mm
165,000	16,500	1000	100	10	ly		487.26 µm

For cloth and silk, based on [TABE], and at Huế, based on [MART3]

							Metric	Metric
cuo or gòn							194.904 000 m	191.640 000 m
10	cài vãi or thất						19.490 400 m	19.164 000 m
30	3	trượng					6.496 800 m	6.388 000 m
300	30	10	thước				649.680 mm	633.800 mm
3000	300	100	10	túc			64.968 mm	63.880 mm
30,000	3000	1000	100	10	phân		6.496 8 mm	6.388 0 mm
300,000	30,000	10,000	1000	100	10	ly	649.68 µm	638.80 µm

System used by architects, engineers and surveyors at Huế, based on [MART3]

										Metric
đặm										888.964 978 m
2	lý									444.482 489 m
6	3	gọn								148.160 830 m
12	6	2	mẫu							74.080 415 m
60	30	10	5	cài vãi or thất						14.816 083 m
120	60	20	10	2	sào					7.408 041 m
360	180	60	30	6	3	ngũ				2.469 347 m
1800	900	300	150	30	15	5	thước			493.869 mm
18,000	9000	3000	1500	300	150	50	10	túc		49.387 mm
180,000	90,000	30,000	15,000	3000	1500	500	100	10	phân	4.938 7 mm
1,800,000	900,000	300,000	150,000	30,000	15,000	5000	1000	100	10	ly 493.87 μm

Other reported measures:

- 1 thước vai = 0.644 m;
- 1 thước may = 0.625 m ;
- 1 thước de ruong = 0.470 m;
- 1 thước moc = 0.425 m.

19.2 Units of Area

					Metric
quo					9 940.5 m ² or 8 128.08 m ²
2	mẫu				4 970.25 m ² or 4 064.04 m ²
20	10	sào			497.025 m ² or 406.404 m ²
300	150	15	thước		33.135 m ² or 27.093 6 m ²
1800	900	90	6	ngũ ²	5.522 5 m ² or 4.515 6 m ²

19.3 Units of Dry Capacity

Traditional system and metric linked system, at Huế

		Metric	Metric
toa, scita, shita, or teu		56.52 L	56 L
2	hao	28.26 L	28 L

19.4 Units of Liquid Capacity

In general, liquids were sold by weight.
Some reported measures:

- 1 canan (at Huế, based on [MART3]) = 510.0 mL.

19.5 Units of Weight

Traditional upper scale

						Metric
cuan or quân						311.844 kg
5	ta					63.368 8 kg
10	2	bìn or bình				31.184 4 kg
50	10	5	yên or jen			6.236 88 kg
500	100	50	10	eân or cahn^a		623.688 g
800	160	80	16	1 $\frac{3}{5}$	nén	389.805 g

^aAlso reported as about 593 g

Traditional middle scale

						Metric
nén						389.805 g
10	lượng or lang					38.980 5 g
100	10	đông or tien				3.898 05 g
1000	100	10	fan or phân			389.805 mg
10,000	1000	100	10	ly or li		38.980 5 mg
100,000	10,000	1000	100	10	hào	3.898 05 mg

Traditional lower scale

						Metric
hào						3.898 05 mg
10	hót					389.805 μ m
100	10	shau or châu				38.980 5 μ m
1000	100	10	hui or huy			3.898 05 μ m
10,000	1000	100	10	trán		0.389 05 μ m
100,000	10,000	1000	100	10	ái	0.038 98 μ m

Upper scale at Huế, based on [MART3]

										Metric
cuan or quân										312.400 000 kg
5	ta									62.480 000 kg
10	2	bìn or bình								31.240 000 kg
50	10	5	yên or jen							6.248 000 kg
500	100	50	10	eân or cahn						624.800 g
800	160	80	16	1 $\frac{3}{5}$	nén					390.500 g
8000	1600	800	160	16	10	lượng				39.050 g
80,000	16,000	8000	1600	160	100	10	đông			3.905 g
800,000	160,000	80,000	16,000	1600	1000	100	10	fan or phân		390.5 mg
8,000,000	1,600,000	800,000	160,000	16,000	10,000	1000	100	10	ly	39.05 mg

Lower scale at Huế, based on [MART3]

							Metric
ly							39.05 mg
10	hào						3.905 mg
100	10	hót					390.5 µg
1000	100	10	shau or châu				39.05 µg
10,000	1000	100	10	hui or huy			3.905 µg
100,000	10,000	1000	100	10	trán		0.390 5 µg
1,000,000	100,000	10,000	1000	100	10	ai	0.039 05 µg

Metric linked upper scale

							Metric
cuan or quân							67.95 kg
1⅓	ta						60.40 kg
–	–	picul					60 kg
2¼	2	–	bìn or bình				30.20 kg
11¼	10	–	5	yên or jen			6.04 kg
112½	100	–	50	10	eân or cahn		604.00 g
180	160	–	80	16	1⅓	nén	377.50 g

Metric linked lower scale

							Metric
nén							37.75 g
10	lỵóng or lang						3.775 g
100	10	đông or tien					377.50 mg
1000	100	10	fan or phân				37.75 mg
10,000	1000	100	10	ly or li			3.775 mg
100,000	10,000	1000	100	10	hào		37.75 g

Other reported measures:

1 **picul** (after the metrification) = 60 kg;

20 Antarctica

According to the Antarctic Treaty System (officially entered into force in 1961), Antarctica is a scientific preserve. The treaty also established freedom of scientific investigation and banned military activity on the Antarctic continent.

20.1 Currency

The Antarctica Overseas Exchange Office was established in the late 1990s with the aim of issuing banknotes, in US dollars, as a fund-raising exercise.

21 Antigua and Barbuda

See also *United Kingdom*.

After Spanish settlement in 1493 by Christopher Columbus, Antigua was settled by

British colonists in 1632, occupied by the French in 1666, and ceded back to Britain in 1667. At any rate, Britain did not take control of the area until 1707. The islands became an independent state within the Commonwealth of Nations, as Antigua and Barbuda, in 1981.

The British Imperial system was generally used before metrification, and was stated as the standard by the Weight and Measures Act of February 19, 1917. The metric system is reported as being used since the early twenty-first century.

Main source: [ECON]

1825–1955: 1 US dollar = 100 cents
1 British pound sterling =
20 shillings = 240 pence =
960 farthings

21.2 Units of Length

British Imperial-linked scale in Antigua

		Imperial	Metric
sett		9 in	228.6 mm
2	node	4½ in	114.3 mm

21.1 Currency

1973–: 1 US dollar = 100 cents
1965–: 1 East Caribbean dollar =
100 cents
1950–1964: 1 British East Caribbean dollar =
100 cents
1935–1950: 1 British West Indies dollar =
100 cents

British Imperial scale

				Metric
mile				1609.344 m
1760	yard			914.4 mm
5280	3	foot		304.8 mm
63,360	36	12	inch	25.4 mm

Metric scale

								Metric
myriametre								10,000 m
10	kilometre							1000 m
100	10	hectometre						100 m
1000	100	10	decametre					10 m
10,000	1000	100	10	metre				1 m
100,000	10,000	1000	100	10	decimetre			100 mm
1,000,000	100,000	10,000	1000	100	10	centimetre		10 mm
10,000,000	1,000,000	100,000	10,000	1000	100	10	millimetre	1 mm

21.3 Units of Area

British Imperial scale

				Metric
acre				4 046.856 422 m ²
4840	square yard			83.612 736 dm ²
43,560	9	square foot		9.290 304 dm ²
6,272,640	1296	144	square inch	6.451 6 cm ²

Metric scale

				Metric
hectare				10,000 m ²
10	Decare			1000 m ²
100	10	are		100 m ²
10,000	1000	100	centiare	1 m ²

21.4 Units of Dry Capacity

British Imperial scale

				Metric
quarter				290.950 L
8	bushel			36.369 L
32	4	peck		9.092 L
64	8	2	gallon	4.546 L

21.5 Units of Liquid Capacity

British Imperial scale

					Metric
gallon					4.546 L
4	quart				1.136 L
8	2	half quart			568.26 mL
32	8	4	gill		142.06 mL
160	40	20	5	fluid ounce	28.41 mL

Metric scale

						Metric
kilolitre						1000 L
10	hectolitre					100 L
100	10	decalitre				10 L
1000	100	10	litre			1 L
10,000	1000	100	10	decilitre		100 mL
100,000	10,000	1000	100	10	centilitre	10 mL

21.6 Units of Weight

British Imperial scale

					Metric
ton					1016.047 043 kg
20	hundredweight				50.802 352 kg
160	8	stone			6.350 294 kg
2240	112	14	pound		453.592 430 g
35,840	1792	224	16	ounce	28.349 527 g

Metric scale										Metric
miller										1000 kg
10	quintal									100 kg
100	10	myriagram								10 kg
1000	100	10	kilogram							1 kg
10,000	1000	100	10	hectogram						100 g
100,000	10,000	1000	100	10	decagram					10 g
1,000,000	100,000	10,000	1000	100	10	gramme				1 g
10,000,000	1,000,000	100,000	10,000	1000	100	10	decigram			100 mg
100,000,000	10,000,000	1,000,000	100,000	10,000	1000	100	10	centigram		10 mg
1,000,000,000	100,000,000	10,000,000	1,000,000	100,000	10,000	1000	100	10	milligram	1 mg

22 Arabia

See *Ancient Arabia*, *Islamic Caliphates*, *Ayyūbid*, *Hejaz* and *Saudi Arabia*.

23 Crown of Aragon

See also *Balearic Islands, Italy, Malta, Naples, Kingdom of Sardinia, and Spain.*

This was a dynastic union of states, originated in the union of the Kingdom of Aragon and the County of Barcelona in 1162. The Crown of Aragon also eventually came to include the Kingdom of Majorca (1229), the Kingdom of Valencia (1245), Malta (1409), the Kingdom of Sardinia (1420), and the Kingdom of Naples (1504).

Main sources: [ALSI], [ALTE], [ARAV], [BURR2], [CLAU], [COLE], [DIRE], [FLÜG], [HAMI], [KELL], [LLYD], [MART3], and [TORR2]

23.1 Kingdom of Aragon

23.1.1 Currency

In Barcelona:

1848—: 1 peso duro Catalan = $3\frac{3}{4}$ libras Catalan = 20 reales = $37\frac{1}{2}$ sueldos = 450 dineros

-1848: 1 libra Catalan = $6\frac{2}{3}$ reals de Plata
Catalan = 10 reals Ardites =
20 sueldos = 240 dineros = 480 mallas

23.1.2 Units of Length

In Barcelona, as estimated in 1829 and according to [DIRE]

					Metric	Metric
cana					1.552 m	1.555 m
2	media cana or vara				776 mm	777.5 mm
8	4	palmo			194 mm	194.375 mm
16	8	2	medio palmo		97 mm	97.187 5 mm
32	16	4	2	cuarto	48.5 mm	48.593 75 mm

For cloth in Barcelona, according to [KELL]

			Metric
canna^a			1.538 5 mm
8	palmo		192.309 mm
32	4	cuarto	48.077 mm

^a54⅓ cannas = 100 vara de Burgos

For the sale of oak staves from Naples and Tuscany in Barcelona

		Metric
cana		1.746 m
9	palmo	194 mm

For fabrics in Barcelona

				Metric
cana tiene				15.55 m
2	media cana			7.775 m
8	4	palmo		1.944 m
32	16	4	cuarta	485.94 mm

In Gerona

			Metric
cana			1.559 m
8	palmo		194.88 mm
32	4	cuarto	48.72 mm

In Huesca

						Metric
legua						6 176 m
8000	vara					772.0 mm
24,000	3	tercia				257.3 mm
32,000	4	1⅓	palmo			193.0 mm
288,000	36	12	9	pulgada		21.44 mm
384,000	48	16	12	1⅓	dedo	16.08 mm

In Lérida

			Metric
cana			1.556 m
8	palmo		194.5 mm
32	4	cuarta de palmo	48.625 mm

In Zaragoza before 1859

										Metric
legua										5537.001 600 m
3588	braza or estado									1.543 200 m
7176	2	vara								771.600 mm
21,528	6	3	pié							257.200 mm
28,704	8	4	1⅓	cuarta or palmo						192.900 mm
57,408	16	8	2⅔	2	medio palmo					96.375 mm
258,336	72	36	12	9	4½	pulgada				21.433 mm
344,448	96	48	16	12	6	1⅓	dedo			16.075 mm
3,100,032	864	432	144	108	54	12	9	linea		2.489 mm
37,200,384	10,368	5184	1728	1296	648	144	108	12	punto	207.4 μm

Other reported measures:

1 **media cana** (in Tarragona) = 780 mm.

23.1.3 Units of Area

Traditional measures:

1 **cahizada** = the amount of land that would be sown with a cahiz of grain.

Other measures reported during the nineteenth century:

1 **cahizada** (in the province of Zaragoza) = 5457 varas cuadradas = 3814.3 m²;

1 **jornal** (in Tarragona) = 2338 m².

23.1.4 Units of Volume

1 **cana cúbica** (in Barcelona) = 3.760 028 875 m³.

In Barcelona

						Metric
mojada or jornal						4896.500 6 m ²
2	cuartera					2448.250 3 m ²
2025	1012½	cana cuadrada				2.418 025 m ²
8100	4050	4	paso cuadrada			60.450 6 dm ²
129,600	64,800	64	16	palmo cuadrada		3.778 2 dm ²
2,073,600	1,036,800	1024	256	16	cuarta cuadrada	23.61 cm ²

In Gerona

						Metric
jornal						4374.865 8 m ²
2	vesana					2187.432 9 m ²
12	6	porca				364.572 15 m ²
1800	900	150	cana cuadrada			2.430 481 m ²
115,200	57,600	9600	64	palmo cuadrada		3.797 6 dm ²
4,147,200	2,073,600	345,600	2304	36	pié cuadrada	10.55 cm ²

In Lérida

						Metric
jornal						4358.044 8 m ²
2	media jornal					2179.022 4 m ²
12	6	porca				363.170 4 m ²
1800	900	150	cana cuadrada			2.421 136 m ²
115,200	57,600	9600	64	palmo cuadrada		3.783 025 dm ²

At Lleida

			Metric
jornal			4578.12 m ²
12	porca		381.51 m ²
6552	546	varas cuadradas	698.74 m ²

23.1.5 Units of Dry Capacity

For general use, based on [DIRE] and [MART3], and for corn in Barcelona

						Metric	Metric	Metric
salma or tonelada						278 L	278.072 064 L	273.676 L
1 $\frac{3}{5}$	carga					173.75 L	173.795 040 L	171.047 L
4	2 $\frac{1}{2}$	cuartera				69.50 L	69.518 016 L	68.419 L
8	5	2	media cuartera			34.75 L	34.759 008 L	34.209 L
48	30	12	6	cortan or cuartán		5.792 L	5.793 168 L	5.702 L
192	120	48	24	4	picotin	1.447 9 L	1.448 292 L	1.425 4 L

In Gerona

						Metric
carga						123.84 L
4	barrilon					30.96 L
8	2	mallal				15.48 L
64	16	8	cuarta			1.935 L
128	32	16	2	porron		967.5 mL
256	128	64	8	4	petricon	241.88 mL

In Lérida

						Metric
tonelada						293.44 L
1 $\frac{3}{5}$	carga					183.40 L
4	2 $\frac{1}{2}$	cuartera				73.36 L
48	30	12	cuartán			6.113 L
192	120	48	4	picotin		1.528 L

At Teruel

		Metric
fanega		43.42 L
16	cuartilla	2.714 L

Other measures reported during the nineteenth century:

1 **cuartera** (in Tarragona and Tortosa) = 69.75 L.

In Zaragoza

				Metric
cahiz^a				180.49 L
8	fanega			22.56 L
24	3	cuartale		7.521 L
96	12	4	celemine or almude	1.880 L

^a[DOUR] also reported it as 179.36 L

23.1.6 Units of Liquid Capacity

Traditional system in Barcelona

									Metric
tonelada									971.20 L
2	pipa								485.60 L
6	3	baril							161.87 L
8	4	1 $\frac{1}{3}$	carga						121.40 L
32	16	5 $\frac{1}{3}$	4	barrilón					30.35 L
128	64	21 $\frac{1}{3}$	16	4	cuartan				7.535 L
256	128	42 $\frac{2}{3}$	32	8	2	cuartin			3.767 L
1024	512	170 $\frac{2}{3}$	128	32	8	4	mitadella or porron		941.87 mL
4096	2048	682 $\frac{2}{3}$	512	128	32	16	4	petricon	235.47 mL

For wine in Barcelona, based on [DIRE]

						Metric
pipa						495.024 L
4	carga or charge					123.756 L
48	12		arroba or cortane			10.313 L
96	24		2	cortarine		5.156 5 L
288	72		6	3	meitadella	1.718 8 L
2048	512		42 $\frac{2}{3}$	21 $\frac{1}{3}$	7 $\frac{1}{6}$	porron 241.7 mL

For wine in Barcelona, based on [MART3]

										Metric
tonelada										964.608 L
2	pipa									482.304 L
6	3	baril								160.768 L
8	4	1 $\frac{1}{3}$	carga							120.576 L
32	16	5 $\frac{1}{3}$	4	barillon						30.144 L
64	32	10 $\frac{2}{3}$	8	2	mallal					15.072 L
128	64	21 $\frac{1}{3}$	16	4	2	cortan				7.536 L
256	128	42 $\frac{2}{3}$	32	8	4	2	cortin			3.768 L
1024	512	170 $\frac{2}{3}$	128	32	16	8	4	porron		942 mL
4096	2048	682 $\frac{2}{3}$	512	128	64	32	16	4	petricó	235.5 mL

For brandy in Barcelona

					Metric
carga					121.40 L
16	cuartan				7.587 L
32	2		cuartin		3.794 L
128	8		4	mitadella or porron	948.44 mL

For oil in Barcelona, based on [DIRE] and on [MART3]

							Metric	Metric
pipa							491.77 L	489.168 L
$3\frac{19}{20}$	carga						124.50 L	123.840 L
$7\frac{7}{10}$	2	barral					62.25 L	61.920 L
$15\frac{1}{2}$	4	2	barrilón				31.125 L	30.960 L
$118\frac{1}{2}$	30	15	$7\frac{1}{2}$	cortan or cuartán			4.150 L	4.128 L
474	120	60	30	4	cuarto		1.037 L	1.032 L
1896	480	240	120	16	4	cuarta	259.37 mL	258 mL

In Girona

						Metric
carga						180.80 L
$2\frac{1}{2}$		cuartera				72.32 L
10	4		cuartan			18.08 L
60	24		6	mesuron		3.013 L
120	48		12	2	picotin	1.507 L

In Lérida

				Metric
carga				91.040 L
8	cántare			11.380 L
96	12	porron		948.333 mL
384	48	4	petricon	237.083 mL

For oil in Lérida

						Metric
carga						125.76 L
2	barral					62.88 L
4	2	barrilon				31.44 L
30	15	$7\frac{1}{2}$	cuartan			4.192 L
480	240	120	16	cuarto		262 mL
1920	960	480	64	4	cuarta	65.5 mL

Two reported scales for wine and spirits at Saragossa

				Metric	Metric
carga or nietro				159.36 L	165.89 L
16	cantaro or arroba			9.96 L	10.37 L
128	8	azumbre		1.245 L	1.296 L
512	32	4	cuartillo	311.25 mL	324 mL

For wine and other alcoholic beverages in Tarragona

			Metric
carga			138.64 L
4	armiña, arminya, ermina, or hermina		34.66 L
128	32	porron	1.083 L

For oil in Tarragona and Reus, according to [ALSI]

		Metric	Metric
cinquena or sinquena^a		20.10 L	20.75 L
5	quartan	4.02 L	4.15 L

^aAccording to [DIRE, p. 49], = 20.65 L in Tarragona

For spirits in Tortosa (by weight)

			Metric
aroba			10.426 kg
4	cuarterone		2.606 5 kg
26	6½	libra	401 g

For oil at Tortosa

			Metric
cantaro			16.48 L
8	cadarp		2.06 L
544	68	maquilla	30.3 mL

Traditional and rounded values for oil at Zaragoza

			Metric	Metric	Metric
aroba or arroba			13.545 L	13.5 L	12.423 6 kg
1½	arrobeta or aroba menor		9.03 L	9 L	8.282 4 kg
36	24	libra	376.25 mL	375 mL	345.1 g

Other measures reported during the nineteenth century:

1 **corter** (in Tarragona) = 3.767 5 L.

23.1.7 Units of Weight

Mercantile scale in Barcelona, Girona, and Tarragona; in Lérida

										Metric	Metric
tonelada tiene										832.0 kg	834.079 kg
6⅔	carga									124.8 kg	125.112 kg
20	3	quintar								41.6 kg	41.704 kg
80	12	4	arroba or rova							10.4 kg	10.426 kg
320	48	16	4	quarteró						2.6 kg	2.606 5 kg
2080	312	104	26	6½	lliura					400 g	401 g
24,960	3744	1248	312	78	12	unça				33.333 g	33.417 g
99,840	14,976	4992	1248	312	48	4	quart			8.333 g	8.354 g
399,360	59,904	19,968	4992	1248	192	16	4	argenc		2.083 33 g	2.088 54 g
14,376,960	2,156,544	718,848	179,712	44,928	6912	576	144	36	gra	57.87 mg	58.01 mg

For general use in Barcelona, based on [MART3]

							Metric
carga							125.112 kg
3	quintal						41.704 kg
12	4	arroba					10.426 kg
104	34 $\frac{2}{3}$	8 $\frac{2}{3}$	libra carnicera^a				1.203 kg
312	104	26	3	libra			401 g
468	156	39	4 $\frac{1}{2}$	1 $\frac{1}{2}$	marco		267.333 g
3744	1248	312	36	12	8	onza	33.417 g

^aFor meat

For gold and silver in Barcelona

							Metric
marco							267.333 g
8	onza						33.417 g
32	4	cuarto					6.354 g
64	8	2	ochava				4.177 g
128	16	4	2	arienzo, adarme, or argenso			2.088 5 g
640	80	20	10	5	tomin		417.708 mg
4608	576	144	72	36	7 $\frac{1}{5}$	grano	58.015 mg

Alternative scale for gold and silver in Barcelona, based on [KELL] and [FLÜG]

					Metric	Metric
marco					272.654 g	268.375 g
8	onza				34.082 g	33.547 g
32	4	cuarta			8.520 g	8.387 g
192	24	6	adarme or arienzo		1.420 g	1.398 g
6912	864	216	36	grano	39.4 mg	38.8 mg

For medical use in Barcelona

								Metric
libra medicinal								300.750 g
1½	marco							200.500 g
12	8	onza						25.062 5 g
96	64	8	dracma					3.132 8 g
288	192	24	3	escrupulo				1.044 3 g
576	384	48	6	2	obolo			522.1 mg
1728	1152	144	18	6	3	siliqua		174.0 mg
6912	4608	576	72	24	12	4	grano	43.5 mg

In Lérida

									Metric
tonelada									834.080 kg
6 $\frac{2}{3}$	carga								125.112 kg
20	3	quintal							41.704 kg
80	12	4	arroba						10.426 kg
693 $\frac{1}{3}$	104	34 $\frac{2}{3}$	8 $\frac{2}{3}$	libra carnicera					1.203 kg
2080	312	104	26	3	libra				401.00 g
24,960	3744	1248	312	36	12	onza			33.417 g
99,840	14,976	4992	1248	144	48	4	cuarta		8.354 g
399,360	59,904	19,968	4992	576	192	16	4	arxen	2.088 g

Traditional system at Teurel

			Metric
libra			369.712 6 g
12	onza		30.809 g
48	4	cuarto	7.702 g

At Zaragoza

									Metric
carga									151.2 kg
3	quintal								50.4 kg
12	4	arroba							12.6 kg
432	144	36	libra						350 g
648	216	54	1½	marco					233.333 g
5184	1728	432	12	8	onza				29.167 g
20,736	6912	1728	48	32	4	cuarto			7.292 g
82,944	27,648	6912	192	128	16	4	adarme		2.734 g
2,654,208	884,736	221,184	6144	4096	512	128	32	grano	85.4 mg

For gold and silver at Zaragoza (as estimated in 1812 and in 1830, and as rounded for trade)

						Metric	Metric	Metric
libra (pensil)						349.8 g	330 g	350 g
1½	marco					233.2 g	220 g	233.333 g
12	8	onza				29.15 g	27.5 g	29.167 g
48	32	4	cuarto			7.288 g	6.875 g	7.292 g
192	128	16	4	adarme		1.822 g	1.719 g	1.823 g
6144	4096	512	128	32	grano	5.69 mg	5.37 mg	5.70 mg

For medical use at Zaragoza

								Metric
libra								345.101 2 g
12	onza							28.758 4 g
96	8	dracma						3.594 8 g
288	24	3	escrúpulo					1.198 3 g
576	48	6	2	obolo				599.13 mg
1728	144	18	6	3	silicua			199.71 mg
6912	576	72	24	12	4	grano		49.93 mg

23.2 Kingdom of Valencia

23.2.1 Currency

1 libra = 20 sueldos = 240 dineros

1 real = 24 dineros

1 sison = 3 quartos = 6 dineros =
12 maravedises

23.2.2 Units of Length

Old scale in Alicante

										Metric
legua^a										6242.133 m
155%	cuerda									40.128 m
3111%	20	braza								2.006 4 m
7000	45	2¼	vara							912 mm
21,000	135	6¾	3	pié						304 mm
28,000	180	9	4	1⅓	palmo					228 mm
112,000	720	36	16	5⅓	4	cuarto				57 mm
224,000	1440	72	32	10⅔	8	2	pulgada			28.5 mm
298,666⅔	1920	96	42⅔	14⅔	10⅔	2⅔	1⅓	dedo		21.375 mm
3,584,000	23,040	1152	512	170⅔	128	32	16	12	linéa	1.781 mm

^a[DIRE] reported 1 **legua valenciana** = 7 777% Castilian varas = 6 037.092 m. There was also a **legua de 20 al grado** = 5 555.55 m

New scale in Alicante, based on [MART3]

								Metric
cuerda								36.480 m
20	braza							1.824 m
40	2	Vara						912 mm
120	6	3	pié					304 mm
160	8	4	1⅓	palmo				228 mm
1440	72	36	12	9	pulgada			25.333 mm
17,280	864	432	144	108	12	linéa		2.111 mm

Upper old scale in Valencia

				Metric
legua				6348.30 m
155%	cuerda			40.810 5 m
3111%	20	braza		2.040 5 m
7000	45	2¼	vara	906.90 mm

Lower old scale in Valencia

								Metric
vara^a								906.90 mm
3	pié							302.30 mm
4	1⅓	palmo mayor^a						226.725 mm
9⅓	3⅓	2⅔	cuarto					181.380 mm
12	4	3	1¼	palmo or palmo menor				75.575 mm
36	12	9	3¾	3	pulgada or onza			25.192 mm
48	16	12	5	4	1⅓	dedo		18.894 mm

^aAlso used as textile measures

Old scale in Valencia, based on [ADCM]

			Metric
vara			903.30 mm
4	palmo		225.825 mm
16	4	cuarto	56.456 mm

New scale in Valencia before 1859, based on [MART3]

										Metric
legua										6342.000 000 m
155%	cuerda									40.770 000 m
3111%	20	braza								2.038 500 m
7000	45	2¼	vara							906.000 mm
21,000	135	6¾	3	pié						302.000 mm
28,000	180	9	4	1⅓	palmo					226.500 mm
84,000	540	27	12	4	3	palmo menor				75.500 mm
112,000	720	36	16	5⅓	4	1⅓	cuarto			56.625 mm
252,000	1620	81	36	12	9	3	2¼	onza		25.167 mm
336,000	2160	108	48	16	12	4	3	1⅓	dedo	18.875 mm

23.2.3 Units of Area

Upper scale in Alicante

					Metric
yugada					2,395 422.72 m ²
6	cahizada				399 237.12 m ²
36	6	fanegada			66 539.52 m ²
7200	1200	200	braza cuadrada		332.697 6 m ²
28,800	4800	800	4	vara cuadrada	83.174 4 dm ²

Lower scale in Alicante

					Metric
jornal de tierra					4804.153 3 m ²
2	medio jornal				2402.076 65 m ²
4	2	cuarto or cuarton			1201.038 325 m ²
5776	2888	1444	vara cuadrada		83.174 4 dm ²
51,984	25,992	12,996	9	pié cuadrada	9.241 6 dm ²

Two reported scales for agricultural land in Valencia

					Metric	Metric
yugada					29,978.944 384 m ²	29,919.472 2 m ²
6	cahizada^a				4996.490 731 m ²	4986.578 7 m ²
36	6	fanegada			832.748 455 m ²	831.096 45 m ²
7200	1200	200	braza cuadrada		4.163 742 3 m ²	4.155 482 25 m ²
36,450	6075	1012½	5⅙	vara cuadrada	82.246 76 m ²	82.083 6 dm ²

^aUsually for vineyards. In Castellón, reported as about 6700 m²

23.2.4 Units of Volume

1 **vara cúbica** (in Alicante) = 758.550 528 dm³.

23.2.5 Units of Dry Capacity

In Alicante, based on [DIRE], [ARAV], [ALTE], and [KELL]

					Metric	Metric	Metric	Metric
cahiz ^a					249.30 L	241.226 820 L	246.281 25 L	246.668 L
12	barchilla or barquilla				20.775 L	20.102 235 L	20.523 44 L	20.556 L
48	4	celemin			5.193 75 L	5.025 588 L	5.130 86 L	5.139 L
96	8	2	medio celemin		2.596 875 L	2.512 779 L	2.565 43 L	2.569 L
192	16	4	2	cuartilla or cuarteron	1.298 437 L	1.256 390 L	1.282 72 L	1.285 L

^a[DOUR] reported it as 246.37 L

In Benicaló, based on [DOUR]

				Metric
cahiz				199.92 L
12	barchilla			16.66 L
48	4	almude		4.615 L
768	64	16	quartillo	260.31 mL

In Castelló de la Plana

					Metric
cahiz					199.20 L
12	barchilla				16.60 L
48	4	celemín			4.15 L
192	16	4	cuartille		1.037 5 L
384	32	8	2	ochave	518.75 mL

In Valencia based on [HAMI] and [MART3]; [ARAV]; [ALTE]

					Metric ^a	Metric	Metric
cahiz ^b					201.000 000 L	203.021 172 L	203.015 6 L
6	fanega				33.500 000 L	–	–
12	2	barchilla			16.750 000 L	16.918 431 L	16.917 97 L
48	8	4	almude or celemin		4.187 500 L	4.229 608 L	4.229 49 L
192	32	16	4	cuarteron or cuartilla	1.046 875 L	1.057 402 L	1.057 37 L

^aFor grain. According to [HAMI], this standard differed from the measure for salt until 1604. [DOUR] reported it as 205.25 L

^bDuring the early fifteenth century, said to equal 7½ Florentine staia or 1/2 Venetian staio. [CHIA]

Other reported measures:

1 **fanega** (at Dénia in Alicante) = 233.468 L.

23.2.6 Units of Liquid Capacity

For wine and spirits in Alicante (two reported scales)

							Metric	Metric
tonelada							1148.19 L	1155 L
50/21	pipa						482.239 8 L	485.100 L
100	42	cántaro					11.481 9 L	11.550 L
200	84	2	media cántaro				5.740 95 L	5.775 L
400	168	4	2	cuarta cántaro			2.870 48 L	2.887 5 L
800	336	8	4	2	ochtava cántaro		1.435 2 L	1.443 750 L
1600	672	16	8	4	2	mitjeta	717.6 mL	721.875 mL

For wine and spirits in Alicante during the late eighteenth century

						Metric
tonelada						1155 L
2	pipa					577.50 L
100	50	cántaro				11.55 L
400	200	4	azumbre			2.887 5 L
1600	800	16	4	mitjeta		721.875 mL

For wine and spirits in Alicante during the early nineteenth century

						Metric
tonelada or tun						1067 L
2	pipa					533.50 L
80	40	arroba				13.337 L
100	50	1¼	cántaro			10.670 L
800	400	10	8	medio		1.334 L
1600	800	20	16	2	quartillo	666.8 mL

Traditional system for oil in Alicante

					Metric
Carga					139.700 L
10	arroba				13.970 L
12	1½	cántaro			11.641 6 L
48	4½	4	cuarta		2.910 4 L
360	36	30	7½	libra	388.055 mL

Metric-linked system for oil in Alicante

						Metric
carga						259.20 L
12	cántaro or arroba					21.60 L
48	4	cuarta				5.40 L
432	36	9	libra			600 mL
1728	144	32	4	cuarteron		150 mL
5184	432	96	12	3	onza	50 mL

For oil in Alicante, based on [MART3]

		Metric
arroba		14.40 L
24	libra	600 mL

For wine and brandy in Castelló de la Plana

						Metric
carga						169.05 L
15	cántara					11.27 L
60	4	azumbre				2.817 5 L
120	8	2	media azumbre			1.408 75 L
240	16	4	2	micheta		704.375 mL
480	32	8	4	2	cuartile	352.187 mL

For oil in Castelló de la Plana

				Metric
arroba				12.14 L
32	libra			379.37 mL
128	4	cuarta		94.84 mL
384	12	3	onza	31.61 mL

For wine in Valencia

					Metric
pipa					452.340 000 L
6	barril				75.390 000 L
42	7	cantaro			10.770 000 L
168	28	4	cuarto		2.692 500 L
672	112	16	4	mitjeta	673.125 mL

For brandy in Valencia

						Metric
bota seixentena						646.20 L
4	carga					161.55 L
60	15	cántara				10.77 L
240	60	4	azumbre			2.692 L
480	120	8	2	media azumbre		1.346 L
1920	480	32	8	4	cuartile	336.6 mL

For oil in Valencia

					Metric	Metric
carga					127.800 kg	143.160 000 L
12	cántaro or arroba				10.650 kg	11.930 000 L
48	4	cuarta			2.662 5 kg	2.982 000 L
360	30	7½	libra		355.0 g	397.667 mL
4320	360	90	12	onza	29.6 g	33.139 mL

Other measures reported during the nineteenth century:

1 **pipa** (for wine at Benicarló) = 45 cántaras = 484.393 L;

1 **cantara** (for wine at Benicarló) = 10.764 3 L.

23.2.7 Units of Weight

In Alicante

								Metric
tonelada de peso								1023.360 kg
8	carga							127.920 kg
20	2½	quintal						51.168 kg
80	10	4	arroba^a or arrove					12.792 kg
1920	240	96	24	libra				533 g
34,560	4320	1728	432	18	onza			29.61 g
138,240	17,280	6912	1728	72	4	cuarto		7.403 g
552,960	69,120	27,648	6912	288	16	4	adarme	1.851 g
19,906,560	2,488,320	995,328	248,832	10,368	576	144	36 grano	51.4 mg

^a1 **aroba** (for cacao) = 36 libras

In Alicante, based on [MART3]

						Metric
tonelada						1025.280 kg
2	pipa					512.640 kg
8	4	carga				128.160 kg
20	10	2½	quintal			51.264 kg
80	40	10	4	arroba		12.816 kg
1920	960	240	96	24	libra	534.00 g

In Castelló de la Plana

					Metric
carga					128.88 kg
240	libra pescada salado ^a				537.00 g
270	1⅙	libra gorda ^b			477.33 g
360	1½	11/3	libra regular		358.00 g
4320	18	16	12	onza	29.83 g

^aFor salted fish

^bFor fat

In Castelló de la Plana

							Metric
quintal							51.552 kg
–	quintal						45.824 kg
–	–	quintal					42.96 kg
4	–	–	arroba				1.288 8 kg
–	4	–	–	arroba			1.145 6 kg
–	–	4	–	–	arroba		1.074 kg
144	128	120	36	32	30	libra	358.00 g

Gross weight for codfish and tuna fish in Valencia

				Metric
libra gruesa ^a				534.35 g
1½	libra ^b			410.98 g
18	16	onza		25.686 g
72	64	4	cuarta	7.421 g

^aFor large fishes^bFor small fishes

In Valencia

									Metric
carga									128.244 kg
2½	quintal								51.297 6 kg
10	4	arroba grosa ^a							12.824 4 kg
12	4⅔	1⅓	arroba prima ^b						10.687 kg
360	144	36	30	libra sutil					356.233 5 g
4320	1728	432	360	12	onza				29.686 g
17,280	6912	1728	1440	48	4	cuarto			7.421 g
69,120	27,648	6912	5760	192	16	4	adarme		1.855 g
2,488,320	995,328	248,832	207,360	6912	576	144	36	grano	51.538 mg

^aFor carob beans and pumpkin. Sometimes an arroba of 32 libras has been reported for flour^bFor rice and sugar

Upper scale in Valencia, based on [MART3]

									Metric
carga									127.800 kg
2½	quintal								51.120 kg
10	4	arroba gruesa							12.780 kg
11¼	4½	1⅓	arroba di farina ^a						11.360 kg
12	4⅔	1⅓	1⅓	arroba delgada ^b					10.650 kg
120	48	12	10⅔	10	libra de carne ^c				1.065 kg
240	96	24	21⅓	20	2	libra gruesa ^d			532.500 g
270	108	27	24	22½	2¼	1⅓	libra ^e		473.333 g
360	144	36	32	30	3	1½	1⅓	libreta ^f	355.000 g

^aFor flour^bFor glue, pistacci, orange and oil^cFor meat^dFor leather, calfskins and salted fish^eFor saffron and small fresh fish^fAlso called **libra sutil** and **libra menor**

Lower scale in Valencia, based on [MART3]

							Metric
libreta							355.000 g
1½	marco						236.667 g
12	8	onza					29.583 g
48	32	4	cuarto				7.396 g
192	128	16	4	adarme			1.849 g
6912	4608	576	144	36	grano		51.36 mg

Other measures reported during the fifteenth–nineteenth centuries:

1 **sarrie** (for charcoal) = 85.67 kg.

For gold and silver in Alicante

							Metric
marco							237.328 g
8	onza						29.666 g
32	4	cuarta					7.416 5 g
64	8	2	ochava				3.708 25 g
128	16	4	2	adarme			1.854 125 g
384	48	12	6	3	tomin		618.0 mg
4608	576	144	72	36	12	grano	51.5 mg

Two reported scales for gold and silver in Valencia

					Metric	Metric
marco					237.489 g	236.667 g
8	onza				29.686 g	29.583 g
32	4	cuarta			7.421 g	7.396 g
128	16	4	adarme		1.855 g	1.849 g
4608	2 304	144	36	grano	51.54 mg	51.36 mg

For medical use

							Metric
libra medicinal							345.069 675 g
12	onza						28.755 806 g
96	8	dracma					3.594 476 g
288	24	3	escrupulo				1.198 159 g
576	48	6	2	obolo			599.079 mg
1728	144	18	6	3	siliqua		199.693 mg
6912	576	72	24	12	4	grano	49.923 mg

24 Argentina

See also *Spain*.

This area was discovered by the Spanish navigator Juan de Solis in 1516. Spain established the Vice-Royalty of Peru in 1542. In 1580, a permanent Spanish colony was established at Buenos Aires. Argentina was part of the Vice-Royalty of Peru until 1776, when the Vice-Royalty of Rio de la Plata was established. In 1816, the United Provinces of the Rio Plate, which

included Argentina, Paraguay and Uruguay, declared their independence from Spain. Argentina was established as a republic in 1862.

The older system from the sixteenth century was derived from the Spanish Castilian system. The metric system became official by laws of September 1, 1863, October 7, 1872, and October 11, 1873. At this time, the country comprised 14 provinces and extensive areas. Today, Argentina is divided into 23 provinces and one autonomous city. The metric system became compulsory starting on January 1, 1887. In 1972, the SI system became compulsory.

Main sources: [ALVA], [BALB], [BARB2], [BROW], [BROW5], [ECON], [MART3], [NUEV], [SENI], [UN55], and [UN66]

- 1983–1985: 1 Argentine peso argentino = 100 centavos
- 1970–1983: 1 Argentine peso ley 18.188 = 100 centavos
- c.1850–1970: 1 Argentine escudo = 100 centavos
- 1816–1875: 1 Argentine escudo = 2 pesos = 16 reales or soles = 544 maravedis
- 1776–1816: 1 Spanish escudo = 2 pesos = 16 reales

24.1 Currency

- 2002–: 1 Argentine peso = 100 centavos
- 1992–2002: 1 Argentine peso convertible = 100 centavos
- 1985–1992: 1 Argentine austral = 100 centavos

24.2 Units of Length

Traditional system, based on [BALB], [CLAR], and [UN55]; based on [BROW]

									Metric	Metric
legua									5199.6 m	5195.88 m
40	cuadra								129.990 m	129.897 m
3000	75	braza ^a							1.733 3 m	1.731 96 m
6000	150	2	vara						866.60 mm	865.98 mm
18,000	450	6	3	pié or pièze					288.87 mm	288.66 mm
24,000	600	8	4	1⅓	palmo				216.65 mm	216.495 mm
216,000	5400	72	36	12	9	pulgada			24.072 mm	24.055 mm
2,592,000	64,800	864	432	144	108	12	linéa		2.006 mm	2.005 mm
31,104,000	777,600	10,368	5184	1728	1296	144	12	punto	167 µm	167 µm

^aSometimes called **toesa**

British Imperial-linked system

									Imperial	Metric
cuadra									150 yd	137.16 m
75	braza								2 yd	1.828 8 m
150	2	vara							1 yd	0.914 4 mm
450	6	3	pié or pièze						1/3 yd	304.8 mm
600	8	4	1⅓	palmo					9 in	228.6 mm
5400	72	36	12	9	pulgada				1 in	25.4 mm
64,800	864	432	144	108	12	linéa			1/12 in	2 117 mm
777,600	10,368	5184	1728	1296	144	12	punto		1/144 in	176.39 µm

Other measures reported during the eighteenth–twentieth centuries:

- 1 **legua maritime** = 5556 m. During the late nineteenth century, it was reported as equal to 1 851.889 8 m.

In 1966, the following units were reported to be used to some degree:

- 1 **milla legal** = 1609.344 m;
- 1 **milla marina** = 1852.0 m.

24.3 Units of Area

During the early twentieth century

					varas cuadradas	Metric
manzana ^a					150 × 150	16,873.231 m ²
1 ²⁹ / ₁₉₆	cuadra ^b				140 × 140	14,698.459 m ²
2 ¹ / ₄	1 ²⁴ / ₂₅	cuadra ^c			100 × 100	7499.214 m ²
4	3 ¹⁰⁹ / ₂₂₅	1 ¹ / ₉	solar mayor		75 × 75	4218.308 m ²
9	7 ²¹ / ₂₅	4	2 ¹ / ₄	solar menor	50 × 50	1874.803 m ²

^aAfter metrification: 1 **metric manzana** = 10,000 m²

^bUsed in the city areas. It was also sometimes called a manzana

^cUsed in the countryside. It was also sometimes called a manzana

24.4 Units of Volume

1 **vara** (for timber) = 1½ varas × 1 vara × 1 vara
= 1.5 varas cúbicos = 974.19 dm³.

24.5 Units of Dry Capacity

Traditional system

						Metric
lastre						2057.97 L
2	tonelada					1028.98 L
4	2	cahiz				514.491 4 L
15	7½	3¾	fanega			137.197 7 L
60	30	15	4	cuartilla or espiga		34.299 L
180	90	45	12	3	almud	11.433 L

For wheat during the nineteenth century

		Metric
cahiz		675.53 L
12	fanega	56.30 L

24.6 Units of Liquid Capacity

Traditional system

									Metric
pipa catalana									456.026 47 L
4	cuarterila, cuarterola, or cuarterón								114.006 618 L
6	1½	barril de medida							76.004 412 L
24	6	4	caneca						19.001 103 L
64	16	10⅔	2⅔	cortan					7.125 414 L
120	30	20	5	1⅞	galón				3.800 221 L
192	48	32	8	3	1⅓	frasco			2.375 138 L
768	192	128	32	12	6⅔	4	cuarta		593.785 mL
1536	384	256	64	24	25⅔	8	2	octava	296.892 mL

Other measures reported during the mid-nineteenth century:

1 **foudre** = 780.120 44 L.

Metric-linked system before 1873

									Metric
pipa									456 L
4	carga								114 L
6	1½	barile							76 L
24	6	4	caneca						19 L
64	16	10⅔	2⅔	cortagne					7.125 L
192	48	32	8	3	frasco				2.375 L
384	96	64	16	6	2	medio			1.187 5 L
768	192	128	32	12	4	2	cuarta		593.75 mL
1536	384	256	64	24	8	4	2	octava	296.875 mL

Metric-linked upper scale after 1873

		Metric
pipa		500 L
4	cuarterola or cuarter	125 L

24.7 Units of Weight

Upper scale before 1873; after 1873, based on [UN55]

						Metric	Metric	Metric
tonelada or tonelada de arqueo						918.735 kg	919.700 kg	919.040 kg
2	cahiz					459.367 5 kg	459.350 kg	459.520 kg
10	5	barrica^a				91.873 5 kg	91.870 kg	91.904 kg
20	10	2	quintal			45.936 75 kg	45.935 kg	45.952 kg
80	40	8	4	arroba^b		11.484 188 kg	11.483.75 kg	11.488 kg
2000	1 000	200	100	25	libra^c	459.367 5 g	459.350 g	459.52 g

^a[BROW5] reported = 76.9 kg and [BARB2] = 91.88 kg

^bAccording to [ALVA] and [BARB2] = 11.485 kg and [ZIMM] = 11.339 81 kg

^cDefined as 33 pulgadas cubicos of distilled water at 4°C = 459.367 3 g, according to [BAUE]

Lower scale, usually used for precious metals, before 1873, after 1873, based on [UN55]

						Metric	Metric	Metric
libra						459.367 5 g	459.350 g	459.52 g
2	marco					229.683 8 g	299.675 g	229.76 g
16	8	onza				28.710 5 g	28.709 g	28.72 g
256	128	16	adarme			1.794 4 g	1.794 g	1.795 g
384	192	24	1½	escrúpulo		1.196 3 g	1.196 2 g	1.196 6 g
9216	4608	576	36	24	grano^a	49.844 4 mg	49.843 mg	49.86 mg

^aThe Castilian grain

Other measures reported during the nineteenth century:

1 **carga de carretera** = 3800–4050 lb = about 1723–1837 kg;

1 **carga de mula** or **carga de liviana** = 340–355 lb = about 154–161 kg;

1 **bale** (for wool) = 420 kg;

1 **bale** (for hay and skins) = varying between 130 and 300 kg;

1 **casco** = varied a lot by location.

1 **libra de boticario** = 344.55 g.

Metric-linked system after 1873

				Metric
metric tonelada				1000 kg
20	metric quintal			50 kg
2000	100	metric libra		500 g
1,000,000	50,000	500	metric grano	1 g

For medical use before 1873

						Metric
libra medicinal						344.525 g
12	onza					28.710 g
96	8	dracma				3.588 8 g
288	24	3	escrúpulo^a			1.196 3 g
3456	288	36	12	ovalo		99.69 mg
41,472	3456	432	144	12	grano	8.31 mg

^aIn pharmacy = 1.95 g

For medical use after 1873

						Metric
libra medicinal						344.530 g
12	onza					28.710 833 g
96	8	dracma				3.588 854 g
288	24	3	escrúpulo			1.179 443 g
3456	288	36	12	ovalo		99.69 mg
41,472	3456	432	144	12	grano	8.31 mg

For gold and silver

		Metric
marco		229.684 g
50	Castellano	4.593 68 g

24.8 Buenos Aires

24.8.1 Units of Length

After 1741, after 1780, after 1822, and after 1835, based on [NUEV]

								Metric	Metric	Metric	Metric
legua								5094 m	5148 m	5206.2 m	5199.6 m
40	cuadra							127.35 m	128.7 m	130.155 m	129.99 m
3000	75	braza						1.698 m	1.716 m	1.735 4 m	1.733 2 m
6000	150	2	vara					849 mm	858 mm	867.7 mm	866.6 mm
18,000	450	6	3	pié				283 mm	286 mm	289.23 mm	288.67 mm
24,000	600	8	4	1 $\frac{1}{3}$	palmo			212.25 mm	214.5 mm	216.92 mm	216.65 mm
216,000	5400	72	36	12	9	pulgada		23.58 mm	23.83 mm	24.10 mm	24.07 mm
2,592,000	64,800	864	432	144	108	12	linea	–	–	–	2.006 mm

After 1857, scale according to Departamento de Ingenieros Civiles de la Nacion

										Metric
legua										5196.0 m
40	cuadra									129.90 m
3000	75	braza								1.732 m
6000	150	2	vara							866.00 mm
18,000	450	6	3	pié or pièze						288.67 mm
24,000	600	8	4	1 $\frac{1}{3}$	palmo					216.50 mm
216,000	5400	72	36	12	9	pulgada				24.056 mm
2,592,000	64,800	864	432	144	108	12	linea			2.004 mm
31,104,000	777,600	10,368	5184	1728	1296	144	12	punto		167 μ m

24.8.2 Units of Area

For general use after 1835

							Metric
legua cuadrada							27,035,840.16 m ²
1600	cudra cuadrada						16,897.400 1 m ²
36,000,000	22,500	vara cuadrada					75.099 556 dm ²
324,000,000	202,500	9	pié cuadrada				8.344 396 1 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada			5.794 719 cm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada		4.024 1 mm ²

For general use after 1857, scale according to Departamento de Ingenieros Civiles de la Nacion

						Metric
legua cuadrada						26,998 416 m ²
1600	cudra cuadrada					16,874.010 m ²
36,000,000	22,500	vara cuadrada				74.995 600 dm ²
324,000,000	202,500	9	pié cuadrada			8.332 844 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		5.786 697 cm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada	4.018 540 mm ²

Upper scale for land areas

					Metric
legua cuadrada^a					26,998 416 m ²
1 $\frac{1}{3}$	suerte de estancia^a				20,248 812 m ²
80	60	concession			337 480.2 m ²
1600	1200	20	manzana per le fabbriche		16 874.01 m ²
1836 $\frac{36}{49}$	1377 $\frac{27}{49}$	22 $\frac{47}{49}$	1 $\frac{29}{196}$	suerte de chacra di Buenos Ayres	14 699.137 6 m ²

^aFor meadows

Lower scale for land areas

					Metric
suerte de chacra di Buenos Ayres					14,699.137 6 m ²
1 $\frac{24}{25}$	suerte de chacra per le campagne^a				7499.5 6 m ²
19,600	10,000		vara cuadrada		74.995 6 dm ²
176,400	90,000	9		pié cuadrada	8.332 8 dm ²

^aUsed in the countryside

Measures by which building grounds were sold in the city

					Metric
manzana (140 × 140 varas)					14,699.137 6 m ²
16	quarto				918.696 1 m ²
32	2	medio quarto			459.348 05 m ²
19,600	1225	612 $\frac{1}{2}$	vara cuadrada		74.995 6 dm ²

Measures by which land was sold in the country

					Metric
legua quadrada					26,998,416 m ²
1 $\frac{1}{3}$	suerta de estancia				20,248,812 m ²
144	108	suerte de chacra			187,489 m ²
2304	1728	16	quadra quadrada		11,718.062 5 m ²
36,000,000	27,000,000	250,000	15,625	vara cuadrada	74.995 6 dm ²

24.8.3 Units of Dry Capacity

Grain, salt, lime and charcoal were sold by heaped measures, while corn was sold by unheaped measures.

Traditional system

					Metric
fanega^a					137.272 L
2	media fanega				68.636 L
4	2	cuartilla			34.318 L
8	4	2	media cuartilla		17.159 L

^a1 fanega (for wheat) = 210 libras = 96.47 kg

Imperial scale

						Imperial	Metric
lastre							1 976.81 L
2	tonelada						988.41 L
4	2	cahiz					494.20 L
15	7½	¾	fanega			¾ Winch. bu	132.14 L
60	30	15	4	cuartilla or espiga			32.95 L
180	90	45	12	3	almud		10.98 L

Other measures reported during the nineteenth century:

1 **fanega** (for peeled corn) = 400 libras = 183.76 kg;

1 **fanega** (for unpeeled corn) = 300 libras = 137.82 kg.

24.8.4 Units of Liquid Capacity

After 1822, after 1833, and after 1835

				Metric	Metric	Metric
barril				57.98 L	59.485 L	59.378 L
5	cuartilla			11.596 L	11.897 L	11.876 L
25	5	frasco		2.319 2 L	2.379 4 L	2.375 137 L
100	20	4	cuarto	579.8 mL	594.85 mL	593.78 mL

After 1835 and metric-linked after 1857

									Metric	Metric
pipa									456.026 304 L	456 L
4	cuarter or carga								114.006 576 L	114 L
6	1½	barril							76.004 384 L	76 L
24	6	4	caneca						19.001 096 L	19 L
64	16	10⅔	2⅔	cortagne					7.125 411 L	7.125 L
192	48	32	8	3	frasco				2.375 137 L	2.375 L
384	96	64	16	6	2	media frasco			1.187 568 L	1.187 5 L
768	192	128	32	12	4	2	cuarto		593.784 mL	593.750 mL
1536	384	256	64	24	8	4	2	octavo	296.892 mL	296.875 mL

Other reported measures during the nineteenth century:

1 **pipa** (for spirits) = 128 British Wine gallons = 484.533 L.

24.8.5 Units of Weight

Traditional system and metric linked

								Metric	Metric
tonelada								918.735 kg	920 kg
20	quintal							45.936 750 kg	46 kg
80	4	arroba						11.484 187 kg	11.5 kg
2000	100	25	libra mercantile					459.367 g	460 g
4000	200	50	2	marco				229.683 75 g	230 g
32,000	1600	400	16	8	onza			28.710 47 g	28.75 g
512,000	25,600	6400	256	128	16	adarme		1.794 44 g	1.797 g
18,432,000	921,600	230,400	9216	4608	576	36	grano	498.45 mg	499 mg

For medical use

							Metric
libra medicinal or libra farmaceutica							344.525 g
12	onza						28.710 4 g
96	8	dracma					3.588 8 g
298	24	3	escrúpulo				1.196 27 g
596	48	6	2	ovalo			598.134 mg
7152	576	72	24	12	grano		49.844 mg

For gold and silver

		Metric
marco		229.683 75 g
50	castellano	4.593 675 g

1 **pesada de cueros de carnero** (for washed sheepskins) = 30 libras = about 13.782 kg;
 1 **castellano** (for gold) = 1/36 marco = 6.380 1 g.

Other measures reported during the nineteenth century:

- 1 **pipa** (for tallow and horse fat) = 1000 libras = 459.37 kg;
- 1 **paca** (for wool and hair) = 850 libras = 390.46 kg;
- 1 **pesada de cueros salados** (for salted hides) = 60 libras = about 27.564 kg;
- 1 **pesda de cueros secos** (for dry hides) = 35 libras = about 16.10 kg or 13.782 kg;

24.9 Catamarca

24.9.1 Units of Length

					Metric
legua					5016.60 m
40	cuadra				125.415 m
6000	150	vara			836.10 mm
18,000	450	3	pié		278.70 mm
216,000	5400	36	12	pulgada	23.225 mm

24.9.2 Units of Area

					Metric
legua cuadrada					25,166,275.560 m ²
1600	cuadra cuadrada				15,728.922 225 m ²
36,000,000	22,500	vara cuadrada			69.906 321 dm ²
324,000,000	202,500	9	pié cuadrada		7.767 369 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada	5.394 006 25 cm ²

24.9.3 Units of Dry Capacity

			Metric
fanega			212.779 L
12	almud		17.731 58 L
24	2	media almud	8.865 79 L

24.9.4 Units of Liquid Capacity

				Metric
cuartilla				13.020 L
5	frasco			2.604 L
20	4	cuarta		651 mL
40	8	2	media cuadrta	325.5 mL

24.9.5 Units of Weight

					Metric
quintal					46.080 kg
4	arroba				11.520 kg
100	25	libra			460.80 g
1600	400	16	onza		28.80 g
25,600	6400	256	16	adarme	1.80 g

24.10 Córdoba**24.10.1 Units of Length**

Scale based on *vara municipal* (used in the city) and on *vara agrária* (used in the country), two reported scales

						Metric	Metric	Metric
legua						5089.80 m	5209.60 m	5256.00 m
40	cuadra					127.245 m	130.240 mm	130.140 m
6000	150	vara				848.30 mm	868.267 mm	876.00 mm
18,000	450	3	pié			282.767 mm	289.422 mm	292.00 mm
216,000	5400	36	12	pulgada		23.563 9 mm	24.118 6 mm	24.333 mm
2,592,000	64800	432	144	12	línea	1.963 66 mm	2.009 88 mm	2.028 mm

24.10.2 Units of Area

Scale based on *vara municipal* (used in the city)

						Metric
legua cuadrada						25,906,064.040 m ²
1600	cudra cuadrada					16,191.290 025 m ²
36,000,000	22,500	vara cuadrada				71.961 289 dm ²
324,000,000	202,500	9	pié cuadrada			7.995 689 78 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		5.552 568 6 cm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada	3.855 95 mm ²

Scale based on *vara agrária* (used in the country)

						Metric
legua cuadrada						27,098 271.360 m ²
1600	cudra cuadrada					16,936.419 60 m ²
36,000,000	22,500	vara cuadrada				75.272 976 dm ²
324,000,000	202,500	9	pié cuadrada			8.363 664 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		5.808 10 cm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada	4.033 4 mm ²

Scale based on another *vara agrária* (used in the country)

						Metric
legua cuadrada						27,080,244.000 m ²
1600	cudra cuadrada					16,925.152 m ²
36,000,000	22,500	vara cuadrada				75.222 9 dm ²
324,000,000	202,500	9	pié cuadrada			8.358 1 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		5.804 2 cm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada	4.031 mm ²

24.10.3 Units of Dry Capacity

				Metric
fanega				216.980 L
12	almud			18.081 7 L
24	2	media almud		9.040 83 L
48	4	2	cuarto	4.520 42 L

24.10.4 Units of Liquid Capacity

				Metric
frasco				2.501 L
4	cuarta			625.25 mL
8	2	media cuarta		312.625 mL
16	4	2	octava	156.312 5 mL

24.10.5 Units of Weight

						Metric
quintal						46.590 kg
4	arroba					11.674 5 kg
100	25	libra				465.90 g
1600	400	16	onza			29.118 75 g
25,600	6400	256	16	adarme		1.819 92 g
921,600	230,400	9216	576	36	grano	50.55 mg

24.11 Corrientes

24.11.1 Units of Length

							Metric
legua							5197.20 m
40	cuadra						129.93 m
6000	150	vara					866.20 mm
18,000	450	3	pié				288.733 mm
24,000	600	4	1½	cuarta			216.550 mm
216,000	5400	36	12	9	pulgada		24.061 mm
2,592,000	64,800	432	144	108	12	línea	2.005 mm

24.11.2 Units of Area

							Metric
legua cuadrada							27,010,887.840 m ²
1600	cuadra cuadrada						16,881.804 9 m ²
36,000,000	22,500	vara cuadrada					75.030 244 dm ²
324,000,000	202,500	9	pié cuadrada				8.336 694 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada			5.789 37 cm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	línea cuadrada		4.020 4 mm ²

24.11.3 Units of Dry Capacity

Two reported scales

			Metric	Metric
fanega			257.10 L	257.010 L
12	almud		21.425 L	21.417 500 L
24	2	media almud	10.712 5 L	10.708 750 L

24.11.4 Units of Liquid Capacity

				Metric
frasco				2.604 L
2	media frasco			1.302 L
4	2	cuarta		651 mL
8	4	2	media cuarta	325.5 mL

24.11.5 Units of Weight

							Metric
tonelada							930.326 kg
20	quintal						46.516 3 kg
80	4	arroba					11.629 075 kg
2000	100	25	libra				465.163 g
32,000	1600	400	16	onza			29.072 68 g
512,000	25,600	6400	256	16	adarme		1.817 04 g
18,432,000	921,600	230,400	9216	576	36	grano	504.73 mg

24.12 Entre-Ríos

24.12.1 Units of Length

Traditional system and as stated by the Departamento de Agrimensores

						Metric	Metric
legua						5211 m	5196 m
40	cuadra					130.275 m	129.90 m
6000	150	Vara				868.50 mm	866.00 mm
18,000	450	3	pié			289.50 mm	288.667 mm
216,000	5400	36	12	pulgada		24.125 mm	24.055 mm
2,592,000	64,800	432	144	12	linea	2.01 mm	2.004 6 mm

24.12.2 Units of Area

Traditional system

						Metric
legua cuadrada						27,154,521 m ²
1600	cuadra cuadrada					16,971.575 6 m ²
36,000,000	22,500	vara cuadrada				75.429 2 dm ²
324,000,000	202,500	9	pié cuadrada			8.381 02 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		582.015 mm ²
6,18,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada	4.042 mm ²

As stated by the Departamento de Agrimensores

						Metric
legua cuadrada						26,998,416 m ²
1600	cuadra cuadrada					16,874.010 m ²
36,000,000	22,500	vara cuadrada				74.995 60 dm ²
324,000,000	202,500	9	pié cuadrada			8.332 84 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		578.669 mm ²
6,718,464,000,000	4,199,040,000	186,624	20736	144	linea cuadrada	4.018 mm ²

Metric-linked system

			Metric
tarea			1000 m ²
2½	melga		400 m ²
10	4	fanegada	100 m ²

24.12.3 Units of Dry Capacity

For aggregates

				Metric
fanega				137.640 L
2	media fanega			68.820 L
4	2	cuartilla		34.410 L
8	4	2	media quartilla	17.205 L

Other measures reported during the nineteenth century:

1 **fanega** (for wheat) = 400 libras = 183.75 kg;

1 **fanega** (for grain) = 288 L.

24.12.4 Units of Liquid Capacity

							Metric
pipa							432.96 L
4	cuarterola						108.24 L
6	1½	barril					72.160 L
120	30	20	galon				3.608 L
192	48	32	1⅔	frasco			2.255 L
768	192	128	6⅔	4	cuarta		563.75 mL
1596	384	256	12⅔	8	2	media cuarta	281.875 mL

24.12.5 Units of Weight

Traditional system and as stated by the Departamento de Agrimensores

								Metric	Metric
tonelada								919.492 kg	923.00 kg
20	quintal							45.974 6 kg	46.15 kg
80	4	arroba						11.493 65 kg	11.537 5 kg
2000	100	25	libra					459.746 g	461.50 g
32,000	1600	400	16	onza				28.734 1 g	28.844 g
512,000	25,600	6400	256	16	adarme			17.958 8 g	18.027 g
1,536,000	76,800	19,200	768	48	3	tomin		5.986 3 g	6.009 g
18,432,000	921,600	230,400	9216	576	36	12	grano	498.86 mg	500.8 mg

Other measures reported during the nineteenth century:

1 **pesada** (for dry leather) = 60 libras = 27.690 kg;

1 **pesada** (for salted hides) = 35 libras = 16.152 kg;

1 **pesada** (for wasped sheep skins) = 30 libras = 13.845 kg.

24.13 Jujuy

24.13.1 Units of Length

Traditional system and scale based on *Castilian standard*

						Metric	Metric
legua						5053.20 m	5015.40 m
40	cuadra					126.33 m	125.385 m
6000	150	vara				842.20 mm	835.90 mm
18,000	450	3	pié			280.73 mm	278.633 mm
216,000	5400	36	12	pulgada		23.39 mm	23.219 mm
2,592,000	64,800	432	144	12	linea	1.95 mm	1.935 mm

24.13.2 Units of Area

Traditional system

						Metric
legua cuadrada						25,534,830.24 m ²
1600	cuadra cuadrada					15,959.268 9 m ²
36,000,000	22,500	vara cuadrada				70.930 084 dm ²
324,000,000	202,500	9	pié cuadrada			7.881 12 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		547.30 mm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada	3.80 mm ²

Scale based on the *Castilian standard*

						Metric
legua cuadrada						25,154,237.16 m ²
1600	cuadra cuadrada					15,721.398 225 m ²
36,000,000	22,500	vara cuadrada				69.872 881 dm ²
324,000,000	202,500	9	pié cuadrada			7.763 653 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		539.143 mm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada	3.744 mm ²

24.13.3 Units of Dry Capacity

For aggregates

				Metric
fanega				55.501 L
2	media fanega			27.750 L
4	2	cuartilla		13.875 L
8	4	2	media quartilla	6.938 L

24.13.4 Units of Liquid Capacity

				Metric
barril				55.550 L
25	frasco			2.222 L
100	4	cuarta		555.5 mL
200	8	2	media cuarta	277.75 mL

24.13.5 Units of Weight

					Metric
quintal					45.931 kg
4	arroba				11.482 75 kg
100	25	libra			459.310 g
1600	400	16	onza		28.706 9 g
25,600	6400	256	16	adarme	1.794 2 g

24.14 La Rioja

24.14.1 Units of Length

					Metric
legua					5053.20 m
40	cuadra				126.330 m
6000	150	vara			842.20 mm
18,000	450	3	pié		280.733 mm
216,000	5400	36	12	pulgada	23.394 mm
2,592,000	64,800	432	144	12	linea 1.949 mm

24.14.2 Units of Area

						Metric
legua cuadrada						25,534,830.24 m ²
1600	cuadra cuadrada					15,959.268 9 m ²
36,000,000	22,500	vara cuadrada				70.930 084 dm ²
324,000,000	202,500	9	pié cuadrada			7.881 12 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		547.30 mm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada	3.80 mm ²

Other measures reported during the nineteenth century:

1 marco (= 8 pulgada × 4 pulgada; for irrigation water) = 17.514 dm².

24.14.3 Units of Dry Capacity

				Metric
fanega				198.040 8 L
2	media fanega			99.020 4 L
12	6	almud		16.503 4 L
24	12	2	medio almud	8.251 7 L

24.14.4 Units of Liquid Capacity

					Metric
cuartilla					12.50 L
5	frasco				2.50 L
10	2	medio frasco			1.25 L
20	4	2	cuarta		625 mL
40	8	4	2	media cuarta	312.5 mL

24.14.5 Units of Weight

					Metric
quintal					45.977 kg
4	arroba				11.494 25 kg
100	25	libra			459.770 g
1600	400	16	onza		28.735 625 g
25,600	6400	256	16	adarme	1.795 977 g

24.15 Mendoza

24.15.1 Units of Length

							Metric
legua							5016.60 m
40	cuadra						125.415 m
6000	150	vara					836.10 mm
18,000	450	3	pié or tercia				278.70 mm
24,000	600	4	1⅓	cuarta			209.025 mm
216,000	5400	36	12	9	pulgada		23.225 mm
2,592,000	64,800	432	144	108	12	linea	1.935 4 mm

24.15.2 Units of Area

						Metric
legua cuadrada						25,166,275.56 m ²
1600	cuadra cuadrada					15,728.922 225 m ²
36,000,000	22,500	vara cuadrada				69.906 321 dm ²
324,000,000	202,500	9	pié cuadrada			7.767 369 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		539.40 mm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada	3.745 8 mm ²

24.15.3 Units of Dry Capacity

				Metric
fanega				111.702 L
2	media fanega			55.851 L
12	6	almud		9.308 5 L
24	12	2	medio almud	4.654 25 L

24.15.4 Units of Liquid Capacity

					Metric
arroba					35.760 L
4	cuartilla				8.940 L
16	4	frasco			2.235 L
32	8	2	media frasco		1.117 5 L
64	16	4	2	cuarta frasco	558.75 mL

24.15.5 Units of Weight

								Metric
tonelada								919.934 kg
20	quintal							45.996 7 kg
80	4	arroba						11.499 175 kg
2000	100	25	libra					459.967 g
32,000	1600	400	16	onza				28.747 937 g
512,000	25,600	6400	256	16	adarme			1.796 746 g
1,536,000	76,800	19,200	768	48	3	tomin		598.915 mg
18,432,000	921,600	230,400	9216	576	36	12	grano	49.910 mg

24.16 Salta

24.16.1 Units of Length

							Metric
legua							5166.60 m
40	cuadra						129.165 m
6000	150	vara					861.10 mm
18,000	450	3	pié				287.033 33 mm
216,000	5400	36	12	pulgada			23.919 44 mm
2,592,000	64,800	432	144	12	linea		1.993 287 mm

24.16.2 Units of Area

							Metric
legua cuadrada							26,693,755.56 m ²
1600	cuadra cuadrada						16,683.597 225 m ²
36,000,000	22,500	vara cuadrada					74.149 321 dm ²
324,000,000	202,500	9	pié cuadrada				8.238 813 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada			572.139 82 mm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada		3.973 19 mm ²

24.16.3 Units of Dry Capacity

			Metric
fanega			377.196 L
12	almud		31.433 L
24	2	medio almud	15.716 5 L

24.16.4 Units of Liquid Capacity

Traditional system and scale based on *frasco de la Municipalidad* (used in the city)

						Metric	Metric
barril						62.50 L	59.378 4 L
5	cuartilla					12.50 L	11.875 7 L
25	5	frasco				2.50 L	2.375 137 L
100	20	4	cuarta			625.0 mL	593.784 mL
200	40	8	2	media cuarta		312.5 mL	296.892 mL
400	80	16	4	2	octava	156.25 mL	148.446 mL

24.16.5 Units of Weight

								Metric
tonelada								919.240 kg
20	quintal							45.962 kg
80	4	arroba						11.490 5 kg
2000	100	25	libra					459.620 g
4000	200	50	2	marco				229.81 g
32,000	1600	400	16	8	onza			28.726 25 g
512,000	25,600	6400	256	128	16	adarme		1.795 39 g
18,432,000	921,600	230,400	9216	4608	576	36	grano	498.72 mg

Based on *libra de la Municipahdad* (used in the city)

								Metric
tonelada								900.80 kg
20	quintal							45.040 kg
80	4	arroba						11.260 kg
2000	100	25	libra					450.400 g
4000	200	50	2	marco				225.2 g
32,000	1600	400	16	8	onza			28.15 g
512,000	25600	6400	256	128	16	adarme		1.759 375 g
18,432,000	921,600	230,400	9216	4608	576	36	grano	488.715 mg

24.17 San Juan

24.17.1 Units of Length

					Metric
legua					5016.60 m
40	cuadra				125.415 m
6000	150	vara			836.10 mm
18,000	450	3	pié		278.70 mm
216,000	5400	36	12	pulgada	23.225 mm

24.17.2 Units of Area

					Metric
legua cuadrada					25,166,275.56 m ²
1600	cuadra cuadrada				15,728.922 225 m ²
36,000,000	22,500	vara cuadrada			69.906 321 dm ²
324,000,000	202,500	9	pié cuadrada		7.767 369 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada	539.40 mm ²

24.17.3 Units of Dry Capacity

				Metric
fanega				137.388 L
12	almud			11.449 L
24	2	medio almud		5.724 5 L

24.17.4 Units of Liquid Capacity

					Metric
arroba					35.748 L
2	media arroba				17.874 L
4	2	cuartilla			8.937 L
8	4	2	media quartilla		4.468 5 L
16	8	4	2	frasco	2.234 25 L

24.17.5 Units of Weight

					Metric
quintal					46.015 5 kg
4	arroba				11.503 875 kg
100	25	libra			460.155 g
1600	400	16	onza		28.759 69 g
25,600	6400	256	16	adarme	1.797 48 g

24.18 San Luis

24.18.1 Units of Length

In the city

							Metric
legua							5016.60 m
40	cuadra						125.415 m
6000	150	vara municipal					836.10 mm
18,000	450	3	pié				278.70 mm
24,000	600	4	1½	cuarta			209.025 mm
216,000	5400	36	12	9	pulgada		23.225 mm
2,592,000	64,800	432	144	108	12	linea	1.935 mm

In the country

						Metric
legua						5203.80 m
40	cuadra					130.095 m
6000	150	vara agrária				867.30 mm
18,000	450	3	pié			289.10 mm
24,000	600	4	1⅓	cuarta		216.825 mm
216,000	5400	36	12	9	pulgada	24.091 7 mm

24.18.2 Units of Area

In the city

							Metric
legua cuadrada							25,166,275.56 m ²
1600	cuadra cuadrada						15,728,922 225 m ²
36,000,000	22,500	vara cuadrada					69.906 321 dm ²
324,000,000	202,500	9	pié cuadrada				7.767 369 dm ²
576,000,000	360,000	16	1⅞	cuarta cudrada			4.369 145 dm ²
46,656,000,000	29,160,000	1296	144	81	pulgada cuadrada		53.940 mm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	11,664	144	linea cuadrada	3.746 mm ²

In the country

						Metric
legua cuadrada						27,079,534.44 m ²
1600	cuadra cuadrada					16,924.709 025 m ²
36,000,000	22,500	vara cuadrada				75.220 929 dm ²
324,000,000	202,500	9	pié cuadrada			8.357 881 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		580.41 mm ²

24.18.3 Units of Dry Capacity

			Metric
fanega			201.153 6 L
12	almud		16.762 8 L
24	2	media almud	8.381 4 L

24.18.4 Units of Liquid Capacity

					Metric
arroba					35.712 L
4	cuartilla				8.928 L
16	4	frasco			2.232 L
32	8	2	media frasco		1.116 L
64	16	4	2	cuarta frasco	558 mL

24.18.5 Units of Weight

								Metric
tonelada								944.12 kg
20	quintal							47.206 kg
80	4	arroba						11.801 5 kg
2000	100	25	libra					472.060 g
32,000	1600	400	16	onza				29.503 75 g
512,000	25,600	6400	256	16	adarme			1.843 98 g
1,536,000	76,800	19,200	768	48	3	tomin		614.66 mg
18,432,000	921,600	230,400	9216	576	36	12	grano	51.22 mg

24.19 Santa Fé

24.19.1 Units of Length

							Metric
legua							5196 m
40	cuadra						129.90 m
6000	150	vara					866.0 mm
18,000	450	3	pié				288.67 mm
24,000	600	4	1½	cuarta			216.50 mm
216,000	5400	36	12	9	pulgada		24.055 mm
2,592,000	64,800	432	144	108	12	linea	2.004 6 mm

24.19.2 Units of Area

						Metric
legua cuadrada						26,998,414.400 m ²
1600	cuadra cuadrada					16,874.009 m ²
36,000,000	22,500	vara cuadrada				74.995 6 dm ²
324,000,000	202,500	9	pié cuadrada			8.332 8 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada		5.78 cm ²
6,718,464,000,000	4,199,040,000	186,624	20,736	144	linea cuadrada	4.01 mm ²

24.19.3 Units of Dry Capacity

				Metric
fanega ^a				219.957 6 L
12	almud			18.329 8 L
24	2	medio almud		9.164 90 L
48	4	2	cuarto	4.582 45 L

^a1 fanega (for wheat) = 375 libras = 137.81 kg

24.19.4 Units of Liquid Capacity

					Metric
barril					76 L
32	frasco				2.375 L
64	2	media frasco			1.187 L
128	4	2	cuarta		593.75 mL
256	8	4	2	media cuarta	296.87 mL

24.19.5 Units of Weight

Two reported scales

							Metric	Metric
tonelada							926.676 kg	926.776 kg
20	quintal						46.333 8 kg	46.338 8 kg
80	4	arroba					11.583 4 kg	11.584 7 kg
2000	100	25	libra				463.338 g	463.388 g
32,000	1600	400	16	onza			28.958 g	28.962 g
512,000	25,600	6400	256	16	adarme		1.809 8 g	1.810 1 g
18,432,000	921,600	230,400	9216	576	36	grano	50.3 mg	50.3 mg

At Rosario

							Metric
tonelada							918.80 kg
20	quintal						45.940 kg
80	4	arroba					11.485 kg
2000	100	25	libra				459.40 g
32,000	1600	400	16	onza			28.712 5 g
512,000	25,600	6400	256	16	adarme		1.794 5 g
18,432,000	921,600	230,400	9216	576	36	grano	49.8 mg

24.20 Santiago del Estero

24.20.1 Units of Length

Based on [ALBA] and [BALB]

					Metric	Metric
legua					4337 m	4336.50 m
33⅓	cuadra				130.11 m	130.095 m
5000	150	vara			867.40 mm	867.30 mm
15,000	450	3	pié		289.133 mm	289.10 mm
180,000	5400	36	12	pulgada	24.094 mm	24.092 mm

24.20.2 Units of Area

Based on [ALBA] and [BALB]

					Metric	Metric
legua cuadrada					18,809,569 m ²	18,805,232.25 m ²
1111⅓	cuadra cuadrada				16,928.612 10 m ²	16,924.709 025 m ²
25,000,000	22,500	vara cuadrada			75.238 28 dm ²	75.220 929 dm ²
225,000,000	202,500	9	pié cuadrada		8.359 81 dm ²	8.357 881 dm ²
32,400,000,000	29,160,000	1296	144	pulgada cuadrada	580.54 mm ²	580.408 mm ²

24.20.3 Units of Dry Capacity

			Metric
fanega			347.193 6 L
12	almud		28.932 8 L
24	2	media almud	14.466 4 L

24.20.4 Units of Liquid Capacity

Scale based on [ALBA]

						Metric
pipa						356.268 L
6	barril					59.378 L
30	5	cuartilla				11.875 6 L
150	25	5	frasco			2.375 12 L
600	100	20	4	cuarta		593.78 mL
1200	200	40	8	2	media cuarta	296.89 mL

Scale based on [BALB]

					Metric
pipa					480 L
8	barril				60 L
200	25	frasco			2.40 L
800	100	4	cuarta		600 mL
1600	200	8	2	media cuarta	300 mL

24.20.5 Units of Weight

						Metric
tonelada						939.872 kg
20	quintal					46.993 6 kg
80	4	arroba				11.748 4 kg
2000	100	25	libra			469.936 g
32,000	1600	400	16	onza		29.371 g
1,024,000	51,200	12,800	512	32	adarme	917.8 mg

For medical use

					Metric
libra					469.936 g
16	onza				29.371 g
128	8	dracma			3.671 375 g
384	24	3	escrúpulo		1.223 791 g
9216	576	72	24	grano	50.99 mg

24.21 Tucumán

24.21.1 Units of Length

In the city

			Metric
legua			4330 m
30 ¹⁰ / ₈₃	cuadra		143.756 m
5000	166	vara municipal	866 mm

In the country

					Metric
legua					5160 m
40	cuadra				129 m
6000	150	vara provincial			860.00 mm
18,000	450	3	pié		286.667 mm
216,000	5400	36	12	pulgada	23.889 mm

24.21.2 Units of Area

In the city

			Metric
legua cuadrada			18,748,900 m ²
907 ¹⁶⁷⁷ / ₆₈₈₉	cuadra cuadrada		20,665.787 536 m ²
25,000,000	27,556	vara municipal cuadrada	74.995 6 dm ²

In the country

					Metric
legua cuadrada					26,625,600 m ²
1600	cuadra cuadrada				16,641 m ²
36,000,000	22,500	vara provincial cuadrada			73.960 dm ²
324,000,000	202,500	9	pié cuadrada		8.217 8 dm ²
46,656,000,000	29,160,000	1296	144	pulgada cuadrada	5.707 cm ²

24.21.3 Units of Dry Capacity

			Metric
almud			31.352 832 L
2	medio almud		15.676 416 L
4	2	cuarto almud	7.838 208 L

24.21.4 Units of Liquid Capacity

				Metric
barril				61.752 6 L
5½	cuartilla			11.875 5 L
26	5	frasco		2.375 1 L
104	20	4	cuarta	593.775 mL

24.21.5 Units of Weight

				Metric
quintal				45.940 kg
4	arroba			11.485 kg
100	25	libra		459.40 g
1600	400	16	onza	28.712 5 g

25 Armenia [Formerly: Armenian Soviet Socialist Republic]

See also *Kingdom of Armenia*.

The Ottoman Empire ruled this area until 1918, when an Armenisan state was re-established. In 1920, the Soviet Union absorbed the area. In 1922, Armenia, Georgia and Azerbaijan were combined to form the Transcaucasian Soviet Federated Socialist

Republic, which became a part of the USSR later that year. When the federation was dissolved in 1936, Armenia became a part of the USSR. Armenia became fully independent in 1991.

25.1 Currency

1993–: 1 Armenian dram = 100 lumas
1924–1993: 1 Russian ruble = 100 kopeks
1919–1924: 1 Armenian ruble = 100 kopeks
–1918: 1 Russian ruble = 100 kopeks

25.2 Units of Length

During the nineteenth century

			Metric
arkan ^a			25.602 98 m
12	cilatsh		2.133 581 m
36	3	arscin	711.194 mm

^aAlso reported as 25.602 7 m

25.3 Units of Area

During the nineteenth century

				Metric
san				54,625 m ²
1 $\frac{2}{3}$	san (small)			32,775 m ²
5	3	biljuk		10,925 m ²
10	6	2	tachta or tan	5462.5 m ²

25.4 Units of Capacity

Both dry commodities and liquids were measured by weight.

For various commodities during the nineteenth century

		Metric
samar		221.136 kg
1 $\frac{1}{2}$	bakla	147.424 kg

25.5 Units of Weight

During the nineteenth century

						Metric
durt-un-ser						19.656 555 kg
4	un-ser					4.914 138 75 kg
8	2	kirk-ar				2.457 069 375 kg
32	8	4	un-ar			614.287 343 g
40	10	5	1 $\frac{1}{4}$	ser		491.413 874 g
320	80	40	10	8	ar	61.426 734 g

Other measures reported during the nineteenth century:

1 “load of a camel” = 314.504 878 kg.

26 Aruba

See also *Netherlands Antilles* and *the Netherlands*.

Aruba was colonized by Spain from 1508 until 1635. The island was under Dutch administration from 1636–1799. Britain occupied Aruba from 1799 to 1802 and from 1805 to 1816. It

became a British protectorate from 1940 to 1942 and a U.S. protectorate from 1942 to 1945. Today, Aruba is one of the three countries that form the Kingdom of the Netherlands, together with the Netherlands and the Netherlands Antilles.

26.1 Currency

1986–:	1 Aruban florin = 100 cents
1825–1986:	1 Netherlands Antillean guilder = 100 cents
Eighteenth century:	1 Dutch guilder = 20 stivers
Seventeenth century:	1 Portuguese joe = 8 pesos = 20 gulden

27 Asante Empire (Also Ashanti Empire)

See also *Akanland*, *Danish Gold Coast*, *Ghana*, *Ivory Coast* and *Swedish Gold Coast*.

The Portuguese began trading in this area in 1482, the Dutch in the sixteenth century, and the British established a fort there in 1645. In 1664, a fortification called Cape Coast Castle, built during Swedish rule, came under British rule. In 1670, the Ashanti Kingdom was established by natives in the area, and became an independent state from the Denkyira in 1701. The empire

stretched from central Ghana to present Togo and Côte d’Ivoire. In 1850, the Coast Castle was sold to Britain. In 1874, the British defeated the Ashanti, and in 1896, it was declared a British colony and renamed the Gold Coast. In 1902, the Asanteman was finally dissolved and the Gold Coast became a British protectorate.

Various systems of weights and measures coexisted and were all employed to determine the value of items. Agreement had to be reached between each trading partner on the system that would be used. The King used a special system for weights and measures that has been reported as being about one-third heavier than the standard weights and measures. During the Eighteenth century, assimilation of Portuguese and Dutch systems of measures took place, and a more standardized system of measurement was developed.

Main sources: [ANTI], [BOWD], [BRAC2], [CHRI], [FORI], [LEWI5], [MARE], [MARK], [MART3], [MENZ], [MUEN], [MÜLL], [NIAN2], [NOBA], [RATT], [SALE4], and [ZELL]

27.1 Currency

Cowrie shells and different types of metal object were the only indigenous currency in use.

For external trade, they also used 1 ounce = 16 achihs = about 38,500 cowries.

27.2 Units of Length

1 pic, covado, or condu = 577.500 mm.

27.3 Units of Capacity

Both liquids and dry commodities were sold by weight.

27.4 Units of Weight

During the seventeenth–early nineteenth centuries, the Ashanti people used miniature bronze and brass figures, depicting such animals as antelopes and crocodiles, and fruits and vegetables for measuring and trading in gold dust (see [MUEN, pp. 30–38]). The King’s scales, weights and boxes were made of solid gold. It was also reported that the King’s weights were one-third heavier than the current weights of the country.

For gold during the seventeenth century, based on [MARE]

							Metric
benda ^a							61.50 g
1⅓	assuwa						46.12 g
2	1½	bendaassa or egguba					30.75 g
2⅔	2	1⅓	sirou				23.06 g
4	3	2	1½	ensamio			15.37 g
8	6	4	3	2	quientas or agirague		7.69 g
16	12	8	6	4	2	mediaraba	3.84 g

^aBenda, the local monetary unit, had a weight of between 54.06 and 54.72 g during this era

Upper system for gold, as reported in 1673, based on [MÜLL]

									Metric
benda									55.296 g
1⅓	egwa-abiessan								41.472 g
2	1½	eggub-abion							27.648 g
3⅔	2⅔	1⅔	assan						15.552 g
4	3	2	1⅔	egwa					13.824 g
5⅓	4	2⅔	1½	1⅓	asjan				10.368 g
6⅔	4⅔	3⅔	1⅔	1⅔	1⅓	perré-surré			8.640 g
8	6	4	2¼	2	1½	1¼	egwa-surré		6.912 g
10⅔	8	5⅔	3	2⅔	2	1⅔	1⅓	ensanne	5.184 g

System reported in 1673 by [MÜLL], in the Kingdom of Fetu, based on [GARR]

	Value based on [GARR]	Metric
bend'aoqui	16 Dutch ounces	492.168 g
bend'anan	8 Dutch ounces	246.084 g
bend'abiessan	6 Dutch ounces	184.563 g
bend'abien	4 Dutch ounces	123.042 g
benda	2 Dutch ounces or 64 guilders	61.521 g
eggwa abiessan	48 guilders	30.760 g
eggub'abien or bend'afan	32 guilders	20.507 g
egguba	16 guilders	10.253 g
asjan	12 guilders	7.690 g
perré-surré	10 guilders	6.408 g
egwa-surré	8 guilders	5.127 g
ensanne	6 guilders	3.845 g
egyrauqué	4 guilders	2.563 g
metaba	2 guilders	1.282 g
essurbima	1 guilder or 6 taku	641 mg
asse	3 taku	320 mg
taku or dambu	1 taku	107 mg

System recorded by Captain George Maclean between 1830 and 1847, based on [GARR]

Asante names	Fanti names	Metric
entenu	entenu	141.0 g
perigwan	perigwan	70.4 g
essua-san-sul	bedah	62.2 g
essua-san	essuasan	53.8 g
–	djua miensan	46.7 g
essuanu	essuanu	35.2 g
–	djuamien	31.1 g

(continued)

Asante names	Fanti names	Metric
esua-ne-sul	sua-ne-sul	26.4 g
(esua)^a	sul	17.6 g
–	djua	15.6 g
anenfi	–	14.3 g
djua	acandjua	13.2 g
essien	essien	11.7 g
perisul	perisul	9.9 g
(sul)^a	–	8.8 g
–	djuasul	7.8 g
djuasul	–	6.6 g
ensan	ensan	5.8 g
bodomu	–	4.9 g
insuansan	–	4.4 g
agiratjwi	agiratjwi or gira	3.9 g
brofu	–	3.6 g
duma	–	3.3 g
sua	sua	2.9 g
bodumbufan	–	2.5 g
insuansafan	–	2.2 g
agiratjwifan	meaton or giri fan	1.9 g
brofan	–	1.8 g
dumafan	–	1.65 g
suafan	suafan	1.4 g
taku miensan	–	0.7 g
taku mienu	–	0.5 g
–	taku	0.33 g
taku	kokua	0.26 g
–	takufan	0.17 g
takufan	simpoah	0.11 g
damba	–	0.074 g
pessua	pessua	0.04 g

^aAs [GARR, p. 257] comments, the sul weight should be reported as 17.6 g

The weight systems were standardized in relation to the coinage weight system that was used by foreign traders. In this way, the weight systems became accommodated to the Islamic mitkal, the Maria Theresa dollar, the Almoravid dinar, the Islamic ounce, the Dutch ounce, the Portuguese peso, the English pennyweight and the British troy ounce.

Islamic mitkal standard during the fifteenth–nineteenth centuries, based on [GARR, p. 265]

Eastern Akan	Western Akan	mitkals	Metric
pereguan or ta	pereguan	16	70.4 g
asuanu	atakpi	8	35.2 g
osua	teasue	4	17.6 g
suru or sudu	bari	2	8.8 g
nsano or nsoanu	bandeasue		5.8 g
nsoansa	nsuansa	1	4.4 g
soa	esoba or esoa		2.9 g
nsoansafa	nso nyo	½	2.2 g
soafa	ba mokue		1.4 g

5						
pereguan						
5	pereguan					
10	2	atakpi				
20	4	2	teasue			
40	8	4	2	bari		
80	16	8	4	2	nsuansa	
160	32	16	8	4	2	nso nyo

Islamic ounce standard during the fifteenth–nineteenth centuries, based on [GARR, p. 265]

Asante and Brong	Western Akan	ounces	Metric
asuasa	ta	2	52.8 g
nnwoa miensa	anui nsa		39.6 g
nnwoa mienu	anui nyo	1	26.4 g
dwoa	anui	1/2	13.2 g
peresuru	asa or esa		9.9 g
nnsomanu or dwoasuru	anuisue	1/4	6.6 g
bodommo	kuabo or tuabo		4.9 g
domma or fiaso	nso nsa	1/8	3.3 g
bodommofa	mokue nyo		2.5 g
dommafa or fiasofa	ba buru or taku buru	1/16	1.65 g

Islamic ounce standard in present-day southern Ghana, based on [GARR, p. 266]

c. 1400–1650	c. 1650–1900	ounces	Metric
asuasa	asuasa	2	52.8 g
nnwoa miensa	anui ne nsano		39.6 g
nnwoa mienu	osua ne suru	1	26.4 g
dwoa	dwoa or kanjua	1/2	13.2 g
peresuru	peresuri		9.9 g
nnsomanu or dwoasuru	dwoasuru or akanjuasuru	1/4	6.6 g
bodommo	bodommo		4.9 g
domma or fiaso	fiaso	1/8	3.3 g
bodommofa	bodommofa		2.5 g
dommafa or fiasofa	fiasofa	1/16	1.65 g

Portuguese ounce standard in Western Akan, based on [GARR, p. 267]

c. 1550–1900	Metric
benda or bannaa	57.4 g
gua nsa	43.0 g
gua nyo	28.7 g
bangbandea nyo	21.5 g
gua or jua	14.3 g
bangbandea	10.8 g
tara or tarae	7.2 g
ndarasue	5.4 g
borofu or nsu nsa n'ba	3.6 g
meteba or ba buru ne ko	1.8 g

Portuguese ounce standard in present-day southern Ghana, based on [GARR, p. 267]

c. 1500–1650	c. 1650–1900	Metric
benda or bannaa	brofa or dommafa	57.4 g
nnwoa miensa	borofo or domma	43.0 g
nnwoa mienu	nsoansa ntaku anan	28.7 g
esiabo mienu	nnomanu , namfisuru or nsano soafa	21.5 g
dwoa	suru dommafa or suru ne brofa	14.3 g
asia or esiabo	onamfi or asia ne soa	10.8 g
peso	osua ne domma or osua ne agyiratwe	7.2 g
metaba ebaasa	asia ne sua	5.4 g
agyiratwe	asuanu ne suru or asuanu ne dwoasuru	3.6 g
metaba or mediataba	–	1.8 g

Troy ounce standard c. 1650–1900, based on [GARR, p. 268]

Eastern Akan	Western Akan	Metric
benda, bennaa or asuasa ne suru	banna	62.2 g
nnwoa miensa or asuanu ne dwoa	ana nsa	46.7 g
nnwoa mienu, bennaafa, osua ne dwoa or osua ne suru ne bodommo	ana nyo	31.1 g
esiabo mienu	bandea nyo	23.4 g
dwoa, abandwoa, onansua or takimansua	ana or anrae	15.6 g
asia, esiabo or suru ne domma	tea or bandea	11.7 g
dwoasuru, abandwoasuru, nansuru or bremanansuru	simbari or samare	7.8 g
nsano or nsoanu	bandeasue	5.8 g
agyiratwe or borofo	simbarifa or samalfa	3.9 g
metaba, agyiratwefa, borofo, dadaako or ackie	meteba, meteva or nsie nyo	1.9 g

For gold in Kumasi during the mid-nineteenth century

					Metric
periguin					50.990 g
1%	benda				45.891 g
2½	2¼	acheh			20.396 g
40	36	16	acquet or achih		1.274 75 g
320	288	128	8	tokoo	155.94 mg

Table for gold weights as reported in 1874, based on [BRAC2]

	ounce	US dollar	dakoo
intaansu	6	12	
intaanu	4	8	
tesuanu	3	6	
pereguin	2	4	
esuaasa	1	11	
esuanu	1	2	
sua			72
nansua			64
namfi			60
gdua			56
esia			48
takumansua			44
peresua			40
suru			36
abumasuru			32
ananfisuru			30
gduasuru			28
nsanu			26
namanu			24
bodomu			22
sawansa			20
agarakwi			18
borowu			16
duma			14
jiaso			13
sowa			12
bodomufa			11
sowansafa			10

(continued)

For gold, based on [NIAN2]

									Metric
n'da-nad or ta-nan									210.24 g
2	nda-nyon or ta-niua								112.12 g
4	2	ta							52.56 g
4⅓	2%	1½	anan-nsan						45.05 g
6½	3¼	1½	1½	anan-nyon					30.03 g
13	6½	2⅔	3	2	anan				15.02 g
26	13	5⅓	6	4	2	simbari			7.51 g
52	26	11⅓	12	8	4	2	simbari-fan		3.754 g
960	480	240	205⅔	137⅔	68⅔	34⅔	17⅔	takou	219 mg

	ounce	US dollar	dakoo
agarakwifa			9
borowufa			8
dumafa			7
tiasofa			6½
sowafa			6

Various measures reported during the late nineteenth century:

1 **sack** (for milled rice) = 240 lbs = 108.862 kg.

1 **load** (new; for cocoa) = 30 kg;

1 **load** (for cocoa) = 27.2 kg.

1 **cru** (for palm oil) = 20.865 262 kg;

1 **ntanu-asoanu** = 177.2 g;

1 **asuasa** = 53.4 g;

1 **suru** = 8.80 g.

28 Ascension Island

This island was discovered by the Portuguese navigator Joao da Nova on Ascension Day in 1501. The island was occupied by Britain in 1815, and was under Admiralty rule until 1922, when it was annexed as a dependency of St. Helena.

29 Ashmore and Cartier Islands (Territory of Ashmore and Cartier Islands)

The Ashmore and Cartier Islands represent some uninhabited tropical islands in the Indian Ocean.

30 Idrisid Emirate of Asir

See also *Mutawakkilite Kingdom of Yemen* and *Saudi Arabia*.

The Emirate was established in 1906 and formally annexed to Saudi Arabia in 1934.

31 Kingdom of Asturias (718–924)

See also *Kingdom of León*.

The Kingdom was established in 718 by Visigothic nobles. In 722, it defeated the Umayyad Caliphate. In 924, it became part of the Kingdom of León.

32 Australia (Commonwealth of Australia)

See also *Coral Sea Islands* and *Heard Island* and *McDonald Islands*.

Captain James Cook explored this nation's east coast, and in 1701, he annexed it for Britain. New South Wales was founded as a colony in 1823, Tasmania in 1825, Western Australia in 1838, South Australia in 1842, Victoria in 1851, and Queensland in 1859. In 1901, the colonies of New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia were federated as states in the Commonwealth of Australia. Australia got sovereignty in 1931.

The metric system has been official since 1961, and compulsory since 1971.

Main sources: [BAUE] and [REGI]

32.1 Currency

1966–: 1 Australian dollar = 100 cents

1909–1966: 1 Australian pound = 20 shillings = 240 pence

–1909: 1 pound sterling = 20 shillings = 240 pence = 960 farthings

32.2 Units of Count

1 **mob** (grouping of several animals being moved to market or another location) = roughly thousands of cattle³ or tens of thousands of sheep.

32.3 Units of Length

1 **perch** (in Quebec) = 5.425 m.

32.4 Units of Area

For land area in Sydney

		Metric
section		323,742.701 7 m ²
80	acre	4046.783 8 m ²

32.5 Units of Volume

Some reported measures:

- 1 **Imperial cord** (an imaginary rick of bolts of dimensions 4 ft × 4 f. × 8 f. = 128 ft³ = 3.624 6 m³;
- 1 **cunit** (for timber) = 100 ft³ = 2.831 7 m³;
- 1 **metric stere** (an imaginary rick of bolts of dimensions 1 m × 1 m × 1 m = 1 m³;
- 1 **super foot, superfoot, or superficial foot** (for timber or lumber) = 1 f. × 1 f. × 1 f. = 1 ft³;
- 1 **packet** (as a unit of retail size) = a small pack less than a pack or carton.

32.6 Units of Dry Capacity

Some reported measures:

- 1 **ton** (for wheat flour, timber and coal) = 907.185 305 kg;
- 1 **butt** = a quantity of greasy wool with the mass of about 89.376 kg;
- 1 **bushel** (for wheat in Melbourne) = 60 lbs = 27.215 559 kg;
- 1 **bushel** (for barley in Melbourne) = 50 lbs = 22.679 633 kg;
- 1 **bushel** (for oat and malt in Melbourne) = 40 lbs = 18.143 706 kg.

Kerosene tins, generally equal to 1073.25 cu in = about 17.6 L, were also used for measuring various commodities.

A full tin was said to hold:⁴

20 lbs (for oats), 25 lbs (for barley), 28 lbs (for potatoes and maize) and 30 lbs (for wheat and bran).

³ 1,200 cattle was called a mob in the Northern Territory. See *Northern Territory Report*, Australia. Dept. of Territories, 1965, p. 23.

⁴ *Advocate*, Sunday, January 15, 1921, p. 1.

32.7 Units of Liquid Capacity

Obsolete names of beer glasses

	4 Imp fl oz	5 Imp fl oz	6 Imp fl oz	7 Imp fl oz	8 Imp fl oz
Canberra (Australian Capitol Territory)	–	pony	–	seven	–
Brisbane (Queensland)	pony	small beer or pony	–	beer	glass or eight
Sydney (New South Wales)	–	pony	–	seven or glass	–
Melbourne (Victoria)	small glass	pony or horse	small glass	glass	–
Adelaide (South Australia)	butcher	pony	–	butcher	–
Perth (Western Australia)	shetland	pony or glass	bobbie or six	glass or middy	–
Hobart (Tasmania)	small beer	–	beer or six	seven	eight
Darwin (Northern Territory)	–	–	–	seven	–

Obsolete names of beer glasses

	9 Imp fl oz	10 Imp fl oz	12 Imp fl oz	15 Imp fl oz	20 Imp fl oz	40 Imp fl oz
Canberra (Australian Capitol Territory)	–	middy or half pint	schmiddy	schooner	pint	–
Brisbane (Queensland)	–	pot	–	schooner	pint	jug
Sydney (New South Wales)	–	middy	schmiddy	schooner	pint	–
Melbourne (Victoria)	–	pot	–	schooner	pint	–
Adelaide (South Australia)	schooner	schooner	–	pint	imperial pint	–
Perth (Western Australia)	–	middy or half pint	–	schooner	pint or pot	–
Hobart (Tasmania)	–	pot or ten	–	schooner or fifteen	pint	–
Darwin (Northern Territory)	–	handle	–	schooner	pint	–

Other measures reported during the twentieth century:

1 **schooner** (for beer after metrification) = 400 mL;

1 **stubbie** = a beer bottle holding 375 mL;

1 **teaspoonful** (after metrification) = 5 mL.

32.8 Units of Weight

Some reported measures:

1 **bale** = ~227 kg (for cotton), ~136.08 kg (greasy wool), ~99.80 kg (scoured wool) and = ~149.685 kg (other commodities);

- 1 **Short ton** (for bran and flour) = 2000 lbs = 907.185 kg;
 1 **hundredweight** = 100 lbs = 45.359 kg;
 1 **bushel** (for rough rice) = 42 lbs = 19.051 kg;
 1 **punnett** (for berries) = 250 g;
 1 **pearl grain** (used in the pearl trade) = $\frac{1}{4}$ carat = 51.4 mg.

33 Austria

See also *Austrian Littoral*, *Austrian-Silesia*, *Germany*, *Hungary*, *Lombardy-Venetia* and *Tyrol*.

This area was a province of the Holy Roman Empire from 976, ruled by Babenberg Margraves, who became Dukes from 1156 until 1376. Then, the Habsburgs became Dukes, and later Archdukes, of the area, and it remained in their possession until 1918. The area was known as Cisleithania during the Dual Monarchy of Austria-Hungary between 1867 and 1918. The Hungarian part was known as Transleithania. Cisleithania consisted of 15 crown lands: Lower Austria, Upper Austria, Bohemia, Bukovina, Carinthia, Carniola, Dalmatia, Galicia and Lodomeria, Littoral, Moravia, Salzburg, Silesia, Tyrol and Vorarlberg. Some of these provinces are presented under their main headings, namely: Bohemia, Bukovina, Dalmatia, Galicia and Lodomeria, Austrian Littoral, Moravia, Silesia and Tyrol. The Austrian Military Frontier and Burgenland are also mentioned below. The Republic of Austria was inaugurated in 1921, but annexed to Germany in 1938. The state regained sovereignty in 1955.

The metric system, except for units of weight, was adopted by the law of July 23, 1871, and the metric system for weights was adopted by the law of January 1, 1873. The metric system has been compulsory since January 1, 1876. This law was replaced by a new law of July 5, 1950.

Main sources: [CHEL], [HIMK], [KAHN], [MART3], [ROTT2], and [WAGN2]

33.1 Currency

- 1999–: 1 Euro = 100 Euro-cents
 1945–2002: 1 Schilling = 100 Groschen
 1938–1945: 1 Reichmark = 100 Pfennig
 1924–1938: 1 Schilling = 100 Groschen
 1923–1924: 1 Schilling = 10 000 Kronen
 1892–1924: 1 Krone = 100 Heller
 1858–1892: 1 Gulden or Florin = 100 Kreuzer
 1753–1858: 1 Conventions-Species-Thaler = 2 Gulden = 16 Schilling = 80 Polturak = 120 Kreuzer = 160 Gröschel = 480 Pfennig = 960 Heller

33.2 Units of Quantity

For paper in 1560

Saum				
2	Ballen			
24	12	Riess		
576	288	24	Buch	
14,400	7200	600	25	Bogen

For paper during the seventeenth century

Ballen				
10	Riess			
200	20	Buch		
4800	480	24		Bogen

For paper before January 1, 1877

Ballen				
10	Riess			
100	10	Buch		
1000	100	10	Lage	
10,000	1000	100	10	Bogen

For writing and printing paper after January 1, 1877

Pack							150,000
15	Ball						10,000
150	10	Ries or Neuries					1000
1500	100	10	Buch				100
15,000	1000	100	10	Heft			10
30,000	2000	200	20	2	Lage		5
150,000	10,000	1000	100	10	5	Bogen	1

33.3 Units of Length

Other reported measures during the early nineteenth century:

Traditional system in Innsbruck

				Metric
Klafter				2.004 582 m
6	Fuß			334.097 mm
72	12	Zoll		27.841 mm
864	144	12	Linie	2.320 mm

1 **Seemeile** = 1852.010 370 m;

1 **Ell** (in Lintz) = 890.63 mm;

1 **Ell** (Austro-Hungarian scale) = 779.2 mm;

1 **Ell** (in Vienna) = 29½ Zoll = 779.07 mm;

1 **Ell** (in Košice) = 603.4 mm;

1 **Ell** (in Buda) = 573.8 mm.

Scale used in salt mining

			Metric
Bergstabel			568.95 m
300	Wiener Klafter		1.896 5 m
1200	4	Salzburger Fuss	474.125 mm

For yarn

							Metric
Schock							697,176 m
12	Bündel						56,098 m
60	5	Stück					11,619.6 m
240	20	4	Strähn				2904.9 m
4800	400	80	20	Wiedel			145.245 m
288,000	24,000	4800	120	60	Faden		2.420 75 m
864,000	72,000	14,400	360	180	3	Wiener Elle	806.917 mm

Scale used in horse trading

			Metric
Faust			105.4 mm
4	Zoll		26.35 mm
16	4	Strich	6.59 mm

After 1876

							Metric
Myriameter							10,000 m
10	Kilometer						1000 m
1000	100	Dekameter					10 m
10,000	1000	10	Meter				1 m
100,000	10,000	100	10	Decimeter			100 mm
1,000,000	100,000	1000	100	10	Centimeter		10 mm
10,000,000	1,000,000	10,000	1000	100	10	Millimeter	1 mm

33.4 Units of Area

Before 1876

				Metric
Joch^a				5754.618 224 64 m ²
3	Metze-Aussaat			1918.206 074 88 m ²
1600	533⅓	Quadratklafter		3.596 636 390 4 m ²
57,600	19,200	36	Quadratfuß	9.990 656 64 dm ²

^aDuring the incorporation into the German Reich (1938–1945), also reported as 1 **Jochacker**

After 1876

								Metric
Quadrat Myriameter								10,000 ha
100	Quadrat Kilometer							100 ha
10,000	100	Hektar						10,000 m ²
1,000,000	10,000	100	Ar					100 m ²
100,000,000	1,000,000	10,000	100	Quadrat Meter				1 m ²
10 ¹⁰	100,000,000	1,000,000	10,000	100	Quadrat Decimeter			1 dm ²
10 ¹²	10 ¹⁰	100,000,000	1,000,000	10,000	100	Quadrat Centimeter		100 mm ²
10 ¹⁴	10 ¹²	10,000,000,000	100,000,000	1,000,000	10,000	100	Quadrat Millimeter	1 mm ²

33.5 Units of Volume

After 1876

						Metric
Dekastere						10 m ³
10	Stere					1 m ³
100	10	Decistere				1,000,000,000 mm ³
10,000	1000	100	Kubik Decimeter			1,000,000 mm ³
10,000,000	1,000,000	100,000	1000	Kubik Centimeter		1000 mm ³
10,000,000,000	1,000,000,000	100,000,000	1,000,000	1000	Kubik Millimeter	1 mm ³

Other measures reported during the nineteenth century:

1 **Ertragsfestmeter** (for solid wood) = 1 m³;

1 **Raummeter** (for piled wood) = 1 m³;

1 **Klafter**³ = 6.821 m³.

33.6 Units of Dry Capacity

Upper scale

							Metric
Muth							1844.605 500 L
15	Kübel						122.973 700 L
30	2	Metze					61.486 850 L
60	4	2	Halbe				30.743 425 L
120	8	4	2	Viertel			15.371 712 L
240	16	8	4	2	Achtel		7.685 856 L
480	32	16	8	4	2	Mühlmaassel or Müllermaassel	3.842 928 L

Lower scale

							Metric
Mühlmaassel or Müllermaassel							3.842 928 L
2	Futtermaassel or Grosses Maassel						1.921 464 L
4	2	Kleines Maassel					960.732 mL
8	4	2	Becher				480.366 mL
32	16	8	4	Viertelbecher			120.009 mL
64	32	16	8	2	Probmetze or Achtelbecher		60.046 mL

For charcoal, legal between 1858 and 1876

			Metric
Sahm			245.947 400 L
2	Kol-Stübich or Zweimetzen		122.973 700 L
4	2	Wiener Metzen	61.486 850 L

For lime, legal between 1858 and 1876

		Metric
Kalkmittel or Kalkmüthel		153.717 125 L
2½	Wiener Metzen	61.486 850 L

After 1876

					Metric
Hektoliter					100 L
100	Liter				1 L
1000	10	Deciliter			100 mL
10,000	100	10	Centiliter		10 mL
100,000	1000	100	10	Milliliter	1 mL

33.7 Units of Liquid Capacity

										Metric
Fuder										1810.848 L
1½	Dreiling^a									1697.670 L
3½	3	Wein Faß								565.890 L
16	15	5	Bier Faß							113.178 L
32	30	10	2	Eimer^b						56.589 L
128	120	40	8	4	Viertel					14.147 250 L
1280	1200	400	80	40	10	Reichs- Maaß				1.414 725 L
2560	2400	800	160	80	20	2	Halbe or Kanne			707.362 mL
3413½	3200	1066⅔	213⅓	106⅔	26⅔	2⅔	1⅓	Grosses Seidel^c		530.521 mL
5120	4800	1600	320	160	40	4	2	1½	Seidel^c	353.681 mL
10,240	9600	3200	640	320	80	8	4	3	2	Pfiff 176.840 mL

^aAlso reported as 24 Eimer = 1 358.136 L

^bAlso reported as 56.604 L

^cFor beer

Ordinary Maass-scale

						Metric
Eimer						58.019 L
40	Maaß					1.450 477 L
41	41/40	Reichsmaaß or Achtring (= 214/3 cubic pouces de Paris)				1.415 100 L
82	41/20	2	Kanne			707.550 mL
164	41/10	4	2	Seidel		353.760 mm
328	41/5	8	4	2	Pfiff	176.890 mm

Pressburger scale (after 1807)

		Metric
Faß		54.444 L
60	Halbe	907.4 mL

Other measures reported during the nineteenth century:

1 **Zimentiereimer** (used until 1855) = 41 Mass
= 58.004 L;

1 **Kopfen** (in Vienna) = 832 mL.

33.8 Units of Weight

Traditional upper scale before 1876, based on [MART3] and [WAGN2]

									Metric	Metric
Frachtlast									2240.240 000 kg	2240.252 kg
10	Karch								224.024 000 kg	224.025 2 kg
7½	1⅓	Pfund^a							168.018 000 kg	–
14⅔ ₁₁	1⅕ ₁₁	1⅕ ₁₁	Saum						154.016 500 kg	154.017 3 kg
16	1⅓	1⅓	1⅓ ₁₀	Saum^b					140.015 000 kg	–
32	3⅓	2⅓	2⅓	2	Lägel				70.007 500 kg	–
40	4	3	2¾	2½	1¼	Centner			56.006 000 kg	56.006 3 kg
200	20	15	13¾	12½	6¼	5	Stein		11.201 200 kg	11.201 26 kg
4000	400	300	275	250	125	100	20	Pfund	560.060 g	560.063 g

^aFor shipping

^bFor steel from Styria

Traditional lower scale before 1876, based on [MART3] and [WAGN2]

									Metric	Metric
Pfund									560.060 g	560.063 g
1½	Pfund^a								490.052 g	–
2	1¾	Mark							–	280.031 g
4	3½	2	Vierding						–	140.002 g
16	14	8	4	Unze					–	35.004 g
32	28	16	8	2	Loth				17.502 g	17.502 g
128	112	64	32	8	4	Quentchen			4.375 g	4.375 g
512	448	256	128	32	16	4	Pfennig, Denat, or Ortchen		1.094 g	1.094 g
7168	6272	3584	1792	448	224	56	14	Gran	–	781.3 mg

^aFor chocolates

Metric-linked zoll scale (by law in 1871)

			Metric
Zollpfund			500 kg
5	Meterzentner		100 kg
10	2	Zentner	50 kg

For medical use until 1555, based on [RUDO2]^a

						Metric	Metric
Apothekenpfund^a						332.507 g	333.212 g
12	Unze					27.709 g	27.768 g
96	8	Drachme				3.464 g	3.471 g
288	24	3	Skrupel			1.154 g	1.157 g
576	48	6	2	Obolus		577.3 mg	578.5 mg
5760	480	60	20	10	Gran	57.7 mg	57.8 mg

^a[RUDO2] used barley grain for specifying the commercial Pfund as 12,800 barley grains = 560.012 g (according to [PRIB]) or 561.2 g (according to [HERK2]). The Apothekenpfund was set at 7600 barley grains, which gives us the *libra medicinalis* as 332.507 125 g or 333.212 5 g

For medical use (the Nuremberg scale) after 1555, based on [ZINS] and [MADE]

							Metric
Apothekenpfund							357.660 g
12	Unze						29.805 g
24	2	Lot					14.902 g
96	8	4	Drachme				3.726 g
288	24	12	3	Skrupel			1.242 g
576	48	24	6	2	Obolus		620.9 mg
5760	480	240	60	20	10	Gran^a	62.1 mg

^aThe weight of a white pepper grain

For medical use (the Vienna scale, *pondus medicinalis*; formally after 1761), based on [ZINS]

							Metric
Pfund							560.012 000 g
1⅓	Apotheker-Pfund^a						420.009 000 g
2	1½	Mark					280.006 000 g
16	12	8	Unze				35.000 750 g
128	96	64	8	Drachme			4.375 094 g
384	288	192	24	3	Skrupel		1.458 364 g
7680	5760	3840	480	60	20	Gran	72.918 mg

^aThis was called the *libra medicinalis major*, as it was almost 17% heavier than the former Nuremberg standard (now called the *libra medicinalis minor*) that had previously been in effect in the north of the empire. See also [HILL5]. In 1774, the *Pharmacopoea Austriaco-provincialis*, [STÖR], used the new standard

For medical use, based on [MART3]

						Metric
Apotheker-Pfund or Medicinal Pfund^a						420.045 000 g
12	Unze					35.003 750 g
96	8	Drachme				4.375 469 g
288	24	3	Skrupel			1.458 490 g
5760	480	60	20	Gran		72.924 mg

^aIn Gesetz of July 23, 1871, R.G.B. 1872, No. 16, the Apotheker-Pfund was reported as 420.045 g. [THAA]

For gold in Vienna before 1857

		Metric
Dukaten		3.490 897 g
60	Dukaten-Gran	58.182 mg

For silver in Vienna before 1857

								Metric
Pfund								561.336 000 g
2	Mark							280.668 000 g
32	16	Loth						17.541 750 g
128	64	4	Quentchen					4.385 437 g
512	256	16	4	Pfennig				1.096 359 g
1024	512	32	8	2	Heller			548.180 mg
2048	1024	64	16	4	2	Viertelpfennig		274.090 mg
131,072	65,536	4096	1024	256	128	64	Richtpfennig	4.282 mg

For gold and silver after 1857

			Metric
Deutsche Munzpfund			500 g
1000	Tausendtheil		500 mg
10,000	10	As	50 mg

For jewels

			Metric
Juwelen Karat			206.103 mg
4	Gran		51.526 mg

Moneys' weight

						Metric
Wiener kölnische Mark						233.890 000 g
16	Loth					14.618 125 g
64	4	Quentchen				3.654 531 g
256	16	4	Pfennig			913.633 mg
65,536	4 096	1 024	256	Richtpfennig		3.569 mg

Other measures reported during the nineteenth century:

- 1 **Lägel** (for hemp) = 1 **Pack** of 1 kg, which makes 150 Klafter of spun yarn;
- 1 **Pfund** (in Kitzbühel) = 565.665 g;
- 1 **Pfund** (in Landeck) = 564.615 g;
- 1 **Pfund** (in Silz) = 563.914 g;
- 1 **Pfund** (in Achau) = 562.923 g;
- 1 **Pfund** (in Rottemburg) = 562.281 g;
- 1 **Pfund** (in Imst) = 562.223 g;
- 1 **Pfund** (in Freundsberg and Schwaz) = 562.106 g;
- 1 **Pfund** (in Thaur and Rettenberg) = 562.048 g;
- 1 **Pfund** (in Stams) = 561.756 g;
- 1 **Pfund** (in Zell am Ziller) = 561.260 g;
- 1 **Pfund** (in Kufstein) = 560.881 g;

- 1 **Pfund** (in Hopfgarten im Brixental) = 559.626 g;
- 1 **Pfund** (in Hirtenberg) = 556.914 g;
- 1 **Pfund** (in Zillertal) = 534.519 g;
- 1 **Pfund** (in Reutte) = 503.474 g.

33.9 Austrian Military Frontier

This area was a borderland of Austria-Hungary during the eighteenth and nineteenth centuries.

33.9.1 Units of Length

1 **Elle** = 584.35 mm.

33.9.2 Units of Area

1 **motika** = 719.33 m².

33.9.3 Units of Dry Capacity

				Metric
Metzen				53.348 8 L
1½	Kuplenik			35.566 L
64	42⅔	Halben		833.57 mL

		Metric
kila		191.351 L
120	okka	1.594 6 L

			Metric
Kübel			108.857 L
4	Viertel		27.214 L
16	4	Achtel	6.803 6 L

33.9.4 Units of Weight

1 **okka** = 1.260 027 kg;

1 **Pfund** = 560.012 2 g.

33.10 Burgenland

33.10.1 Units of Dry Capacity

1 **Mass Hafer gehäuft** (in Neuhaus am Klausenbach) = 25.842 6 L;

1 **Mass-Getreide** (in Neuhaus am Klausenbach) = 19.689 6 L;

33.11 Carinthia [G. Kärnten]

33.11.1 Units of Length

1 **Elle** (before 1857) = 863.988 mm;

1 **Elle** (after 1857) = 863.911 mm.

33.11.2 Units of Dry Capacity

1 **Viertel** (in Roitsch) = 63.092 L.

33.11.3 Units of Liquid Capacity

1 **Eimer** (in the valley of Lavanttal) = 141.472 5 L.

33.11.4 Units of Weight

1 **Pfund** (during the thirteenth century) = 497.788 g;

1 **Pfund** (1704–1756) = 561.635 g;

1 **Pfund** (after 1763) = 560.063 g;

33.12 Carniola

33.12.1 Units of Liquid Capacity

1 **Landeimer** (after 1857 in Carniola) = 21.220 875 L.

33.12.2 Units of Weight

1 **libriczen** (in Carniola, reported in 1518) = 301.239 g.

In Klagenfurt during the fourteenth century and after 1561

						Metric	Metric
Startim						549.360 L	554.480 L
7	Yhre					78.480 L	79.211 L
48	6%	Melter				11.445 L	–
192	27%	4	Messer or Mösser			2.861 25 L	–
336	48	7	1¾	Mass		1.635 L	–
1344	192	28	7	4	Mässl	408.75 mL	–

33.13 Lower Austria
[G. Niederösterreich]

33.13.1 Units of Length

Niederösterreichische masse

						Metric
(Post-) Meile						7585.936 m
4000	Klafter					1.896 484 m
24,000	6	Fuss				316.081 mm
72,000	18	3	Faust			105.360 mm
288,000	72	12	4	Zoll		26.340 mm
3,456,000	864	144	48	12	Linie	2.195 mm

Old scale for coarse linen yarn

			Vienna Ellen	Metric
Strehn			3000	2332.674 m
5	Grosses Wiedel		600	466.534 8 m
1200	240	Grosser Faden	2½	1.943 895 m

English scale for cotton yarn

			English yards	Metric
Scheneller			840	768.096 m
7	Unterband		120	109.728 m
560	80	Faden	1½	1.371 6 m

Old scale for fine linen yarn

			Vienna Ellen	Metric
Strehn			3000	2332.674 m
10	Kleines Wiedel		300	233.267 4 m
2400	240	Kleiner Faden	1¼	971.947 5 mm

Vienna scale for cotton yarn

			Vienna Ellen	Metric
Scheneller			87½	1 156.617 5 m
7	Gebinde		12½	165.231 07 m
700	100	Faden	2⅞	1.652 310 7 m

New scale for linen yarn

						Vienna Ellen	Metric
Schock						864,000	671,810.110 m
12	Bündel					72,000	55,984.176 m
60	5	Stück				14,400	11,196.835 m
240	20	4	Strähn			3600	3134.228 m
4800	400	80	20	Wiedel		180	139.604 m
288,000	24,000	4800	1200	60	Faden	3	2.332 674 m

New scale for cotton yarn

			Vienna Ellen	Metric
Strähn			1487½	1156.617 5 m
7	Gebinde		212½	165.231 07 m
700	100	Faden	2⅞	1.652 310 7 m

New scale for sheep wool yarn

			Vienna Ellen	Metric
Strähn			787½	612.327 m
7	Gebinde		112½	87.475 m
350	50	Faden	2¼	1.749 00 m

New scale for coarse linen yarn until 1876

				Vienna Ellen	Metric
Gespinst				12,000	9330.696 m
4	Schneller or Strähn			3000	2332.674 m
20	5	Wiedel or Gebinde		600	466.534 8 m
4800	1200	240	Faden	2½	1.943 895 m

New scale for fine linen yarn until 1876

				Vienna Ellen	Metric
Gespinst				9000	6998.022 m
6	Schneller or Strähn			1500	1166.337 m
30	5	Wiedel or Gebinde		300	233.267 4 m
7200	1200	240	Faden	1¼	971.947 5 mm

New scale for sheep wool yarn until 1876

			Vienna Ellen	Metric
Schneller or Strähn			1487½	1156.617 5 m
7	Wiedel or Gebinde		212½	165.231 07 m
700	100	Faden	2⅞	1.652 310 7 m

New scale for canvas, used until 1876 by the textile industry

			Vienna Ellen	Metric
Ballen			300	233.267 40 m
5½	Webe		54	41.988 132 m
10	1⅔	Stück	30	23.326 74 m

New scale for cloth, used until 1876 by the textile industry

			Vienna Ellen	Metric
Ballen			384	298.582 270 m
12	Stück		32	24.881 856 m

New scale for muslin, used until 1876 by the textile industry

			Vienna Ellen	Metric
Stück			20	15.551 160 m

New scale for calico, used until 1876 by the textile industry

			Vienna Ellen	Metric
Stück			16	12.440 928 m

New scale for batiste, used until 1876 by the textile industry

			Vienna Ellen	Metric
Stück			15	11.663 370 m

33.13.2 Units of Area

Before 1650:

1 **Öhl** or **Ehl** = 1 bayerischen Siedler.

Before 1760:

- 1 **Tagmahd** = 3 426.43 m²;
 1 **Lüst** or **Lüsse** (for wood) = 1095.12 m².

For fields before 1760

			Metric
Joch			5434.16 m ²
2	Landmetzenfläche		2717.08 m ²

For vineyards before 1760

				Metric
Viertel				2717.08 m ²
1 ¹ / ₃	grosses Achtel			2037.81 m ²
2	1 ¹ / ₂	kleines Achtel		1358.54 m ²
12	9	6	Pfund	226.423 3 m ²

For fields after 1760

						Metric
Stallung Wald						115,092.840 m ²
20	Joch					5754.642 m ²
40	2	Strich				2877.321 m ²
60	3	1 ¹ / ₂	Metzenfläche or Metzen Aussaat			1918.214 m ²
32,000	1600	800	533 ¹ / ₃	Quadratklafter		3.596 652 m ²

For vineyards after 1760

				Metric
Viertel				2877.32 m ²
1 ¹ / ₃	grosses Achtel			2157.99 m ²
2	1 ¹ / ₂	kleines Achtel		1438.66 m ²

33.13.3 Units of Dry Capacity

- 1 **Schaff** (for oats in Wiener Neustadt after 1670) = 707.098 L;
 1 **Schaff** (for grain in Wiener Neustadt after 1670) = 689.045 L;
 1 “gueppfte” **Metzen** (for oats and fruit in Krems an der Donau, as reported in 1590) = 73.783 32 L;
 1 **Land-Metzen** (for barley, rye, wheat and fruit in Krems an der Donau, as reported in 1593) = 61.486 L;

- 1 **Metzen** (in Unter-Enns, before 1670) = 61.482 166 L;
 1 **Metzen** (in Bruck an der Leitha, before 1670) = 58.135 L;
 1 **Metzen** (in Wiener Neustadt) = 56.373 33 L;
 1 **Stangl-Metzen** (in Stockerau, as reported in 1588) = 48.2 L;
 1 **Metreta communis** (in Sankt Pölten, during the thirteenth century) = 42.28 L;
 1 **Chast-Metzen** (in Knering, during the fourteenth century) = 14.093 33 L;
 1 **Müller-Mass** (in Krems an der Donau, as reported in 1691) = 3.842 875 L;
 1 **Futter-Massl** (in Krems an der Donau, after 1772) = 960.718 7 mL;
 1 **Müller-Becher** (in Krems an der Donau, after 1772) = 480.359 3 mL;

For lard, as reported in 1723

				Metric
Emer				43.115 427 L
8	Achtel			5.389 428 L
32	4	Ächtring		1.347 357 L
80	10	2 ¹ / ₂	Pfund	538.943 mL

In Zwettl

			Metric
Metzen			82.160 L
30	Massl		2.738 7 L

33.14 Salzburg

33.14.1 Units of Length

- 1 **Land-Elle** = 5 Spannen = 1.008 361 mm;
 1 **Leinenelle** (for linen) = 1.005 65 m;
 1 **Krämer-Elle** = 4 Spannen = 806.689 mm;
 1 **Seidenelle** (for silk) = 802.85 mm;

Traditional system

				Metric
Feldmaß-Rute				2.974 88 m
10	Rutenfuß			297.488 mm
100	10	Rutenzoll		29.749 mm
1000	100	10	Rutenlinie	2.975 mm

33.14.2 Units of Area

1 **Lutherisches Jaunch** = 8.851 5 dm²;
1 **Tagbau** (at Pinzgau and Pongau) = 5 310 m².

				Metric
Kuh-Fütterung				5 901 m ²
1⅓	Tagbau			3 540.6 m ²
3⅓	2	Autzing		1 770.3 m ²
5	3	1½	Aeche	1 180.2 m ²

33.14.3 Units of Dry Capacity

				Metric
Schaff				362.64 L
6	Metze			60.44 L
72	12	Viertel		5.037 L
288	48	4	Mass	1.259 L

33.14.4 Units of Liquid Capacity

1 **Viertel** (after 1420) = 1.602 L.

					Metric
Eimer					56.589 L
36	Viertel				1.571 9 L
72	2	Kandel			785.958 3 mL
144	4	2	Mass		392.979 2 mL
288	8	4	2	Pfiff	196.489 6 mL

For beer

				Metric
Sud-Bier or Gebräu-Bier				1 527.903 L
1⅛		Dreiling		1 358.136 L
27		24	Eimer	56.589 L

For milk

			Metric
Käsekessel			407.440 8 L
8	Sachter		50.930 1 L
96	12	Napf	4.244 175 L

33.14.5 Units of Dry Capacity

1 **Schaff** (for grain and wheat) = 289.345 88 L.

As reported in 1774

							Metric
grosses Schaff							581.078 4 L
2	kleines Schaff or grosse Büchse						290.539 2 L
4	2	kleine Büchse					145.269 6 L
16	8	4	Metzen				36.317 4 L
60	30	15	3¾	Menns			9.684 64 L
256	128	64	16	4⅞ ₁₅	Massl		2.269 837 5 L
1024	512	256	64	17⅞ ₁₅	4	Viertelchen	567.459 3 mL

As reported during the nineteenth century

			Metric
Metzen			36.168 235 L
16	Massl		2.260 515 L
64	4	Viertelchen	565.129 mL

For oats and barley

			Metric
Schaff			578.691 76 L
60		Hofmass	9.644 86 L

33.14.6 Units of Weight

For general use

				Metric
Centner				56.070 8 kg
100	Pfund			560.708 g
3200	32	Loth		17.522 g
12,800	128	4	Quentchen	4.38 g

For milk

			Metric
Napf			2.242 832 kg
4		Salzburger Pfund	560.708 g

33.15 Styria [G. Steiermark]

33.15.1 Units of Length

In Graz, as reported in 1763

			Metric
Klafter			1.782 696 m
6		Fuss	297.116 mm

Other reported measures:

- 1 **Elle** (in salt chambers) = 1.558 427 m, also reported as 1.555 166 m;
- 1 **Weberelle** (in Graz between 1858 and 1876) = 865.748 mm;
- 1 **Elle** (in Graz before 1857) = 863.988 mm;
- 1 **Elle** (in Graz after 1857) = 863.911 mm;

1 **Elle** = 859 mm;

1 **Wattinger-Elle** = 4 Spannen = 813.165 mm.

33.15.2 Units of Area

1 **Joch** = 5755.745 m²;

1 **Tagwerk** (after 1748) = 5394.978 m².

During the seventeenth century, field sizes were evaluated by the earnings as follows:

1 **Feld-Schober** = 66 sheaves;

1 **Tenn-Schoben** = 6 Mandeln = 20 Schab = 60 sheaves;

1 **Zahl-Schoben** = 60 sheaves;

1 **Kreuz-Schoben** = 22 sheaves;

1 **Steck-Schoben** = 20 sheaves.

33.15.3 Units of Volume

1 **Startim-Kalk** (for lime) = 565.89 dm³.

For firewood

			Metric
Pfanne			409.377 17 m ³
6	Stang		68.229 53 m ³
24	4	Achtel	17.057 38 m ³

For coal after 1575

			Metric
innerberger Fass			307.43 dm ³
1¼	vordenberger Fass		245.944 dm ³
5	4	wiener Metze	61.486 dm ³

33.15.4 Units of Dry Capacity

1 **ennsthaler Metzen** = 153.761 245 L;

1 **Viertel** (in Graz, for oats) = 100.397 880 L;

1 **Viertel** (in Graz, for barley) = 98.929 370 L;

1 **Viertel** (in Graz, for grain) = 97.277 653 L;

1 **Viertel** (in Graz, for beans) = 96.910 567 L;

1 **Viertel** (in Graz, for peas) = 96.727 026 L;

1 **Viertel** (in Stainz) = 82.023 417 L;

- 1 **Viertel** (in Gschnaidt) = 75.553 8 L;
 1 **Viertel** (in Silberberg) = 71.636 266 L;
 1 **Schaffl** (striken measure for oats in Drachenburg, as reported in 1528) = 45.948 L;
 1 **Schaffl** (for wheat in Drachenburg, as reported in 1588) = 42.256 L;
 1 **Halbschaff-Gerste** (in Murau, as reported in 1486) = 40.295 4 L;
 1 **Schaffl** (heaped measure for oats in Drachenburg, as reported in 1528) = 36.922 L.

In Bruck an der Mur District, as reported in 1857

		Metric
Achtel		40.295 387 L
8	Massl	5.036 923 L

In Eibiswald, as reported in 1857

			Metric
Metzen			101.771 13 L
4	Gierz		25.442 78 L
8	2	Massl	12.721 39 L

In Ennstal (in the valley of Enns), as reported in 1857

					Metric
Metzen					153.717 05 L
4	Viertel				38.429 26 L
8	2	Scheffel or Achtel			19.214 63 L
16	4	2	Massl		9.607 32 L
32	8	4	2	Müllermass	4.803 66 L

In Graz before 1444

				Metric
Viertel				78.748 40 L
30	Müllermasse or Octale			2.624 946 6 L
60	2	halbe Müllermasse or Masshefen		1.312 473 3 L
120	4	2	halbe Masshefen	656.236 7 mL

In Graz from 1444 until 1872

							Metric
Viertel							80.590 800 L
2	Viertelhalbe or grosser Gierz						40.295 400 L
4	2	Viertelviertel or kleine Gierz					20.147 700 L
8	4	2	Achtviertel or Massl				10.073 850 L
16	8	4	2	Müller-Massl			5.036 925 L
32	16	8	4	2	halbe Müller-Massl or Masshefen		2.518 462 5 L
64	32	16	8	4	2	halbe Masshefen	1.259 231 25 L

In Judenburg

			Metric
Vierling			163.964 84 L
4	Viertel		40.991 21 L
32	8	Massl	5.123 90 L

In Petzlingsdorf

			Metric
Mutt-Weizen			241.772 4 L
6	Görz		40.295 4 L

In Reun

			Metric
Schaff			322.363 2 L
4	Viertel		80.590 8 L

In Voitsberg, as reported in 1857

			Metric
Viertel			64.684 134 L
8	Massle		8.085 517 L
64	8	Mass	1.010 690 L

33.15.5 Units of Liquid Capacity

1 **alte Bergrechtseimer** (in Hauetzberg, Latschinsberg, Neu-Ritties and Pippeberg) = 26.457 9 L.

Upper scale in Graz from 1445 until 1803

						Metric
Startim						525.056 L
2	Halbe Startim					262.528 L
4	2	¼-Startim				131.264 L
5	2½	1¼	grosser Eimer			105.011 2 L
8	4	2	1⅓	1/8-Startim		65.632 L
10	5	2½	2	1¼	kleiner Eimer	52.505 6 L

Lower scale in Graz from 1445 until 1557

				Metric
grosser Eimer				105.011 2 L
64	Tischkandl			1.640 8 L
128	2	Halbe Tischkandl		820.4 mL
256	4	2	¼-Tischkandl	410.2 mL

Lower scale in Graz from 1557 until 1577

				Metric
grosser Eimer				105.011 2 L
70	Tischkandl			1.500 16 L
140	2	Halbe Tischkandl		750.08 mL
280	4	2	¼-Tischkandl	375.04 mL

Lower scale in Graz from 1577 until 1688

				Metric
grosser Eimer				105.011 2 L
76	Tischkandl			1.381 73 L
152	2	Halbe Tischkandl		690.86 mL
304	4	2	$\frac{1}{4}$ -Tischkandl	345.43 mL

Lower scale in Graz from 1688 until 1803

				Metric
grosser Eimer				105.011 2 L
80	Tischkandl			1.312 64 L
160	2	Halbe Tischkandl		656.32 mL
320	4	2	$\frac{1}{4}$ -Tischkandl	328.16 mL

In Graz after 1803

			Metric
Startin			566.052 4 L
10	Eimer		56.605 24 L
400	40	wiener Maass	1.415 131 L

In Graz before 1876, based on [MART3]

		Metric
Startin		565.890 000 L
10	Eimer	56.589 000 L

In Celje

		Metric
Eimer		28.294 5 L
20	Mass	1.414 725 L

In Vordernberg

		Metric
Eimer		27.893 6 L
17	alte Tisch-Kandln	1.604 8 L

In Altenberg, Langenberg, Rapatzberg and Weriachberg

		Metric
alter Bergrechtseimer		24.612 L
15	alte Tisch-Kandl	1.604 8 L

In Klokhochangerburg and Pustilasach

		Metric
alter Bergrechtseimer		31.175 2 L
19	alte Tisch-Kandl	1.604 8 L

33.15.6 Units of Weight

1 **Pfund** (1704–1756) = 561.635 g;

1 **Pfund** (1763–1858) = 560.063 g;

1 **Pfund** (during the thirteenth century) = 497.788 g;

1 **Friesach** = 467.364 g.

In Graz, based on [MART3]

		Metric
Lägel		70.007 500 kg
125	Pfund	560.060 g

For steel in Styria, according to [KAHN]

		Metric
Lägel		70.007 kg
125	Wiener Pfund	560.050 g

33.16 Upper Austria [G. Oberösterreich]

33.16.1 Units of Length

- 1 **Elle** = 785.960 mm (before 1756) and
798.061 mm (after 1756).

Old scale for linen

				Metric
Fass				2011.113 60 m
2	Ballen			1005.556 80 m
84	42	Stück		23.941 83 m
2520	1260	30	Elle	798.061 mm

Old scale for garment

							Metric
Fardal, Ballon, Fardello or Pack							646.429 41 m
$1\frac{47}{88}$	Samgwant						421.376 20 m
$16\frac{1}{5}$	$10\frac{4}{25}$	Stück					39.903 050 m
$33\frac{3}{4}$	22	$2\frac{1}{2}$	Tuch				19.153 464 m
45	$29\frac{2}{3}$	$2\frac{2}{5}$	$1\frac{1}{3}$	Parchant			14.365 098 m
$202\frac{1}{2}$	132	$12\frac{1}{2}$	6	$4\frac{1}{2}$	Gemünd		3.192 244 m
810	528	50	24	18	4	Elle	798.061 mm

33.16.2 Units of Dry Capacity

- 1 **Schaff** (for oats at Braunau am Inn) = 1 114.17 L;
 1 **Schaff** (for grain in general at Braunau am Inn, according to [DOUR]) = 835.65 L;
 1 **Metzen** (in Gmunden, as reported in 1526) = 162.65 L;
 1 **Schaff** (for grain at Braunau am Inn, according to [ROTT2]) = 95.8 L;
 1 **Metzen** (in Mauthausen) = 79.435 151 L;
 1 **Metzen** (in Wels) = 77.98 L;
 1 **Metzen** (in Neukirch) = 70.466 6 L;
 1 **Metzen** (in Peuerbach as reported in 1526) = 65.540 L;
 1 **Metzen** (in Struden) = 61.468 L;
 1 **Metzen** (in Bad Zell) = 59.576 363 L;
 1 **Metzen** (in Steyr, as reported in 1526) = 58.089 285 L;
 1 **Metzen** (in Stahrenberg, as reported in 1526) = 50.828 125 L.

In Linz and Oberenns after 1625, after 1639 and after 1670

			Metric	Metric	Metric
Mut			2305.50 L	2298.039 18 L	2267.265 L
5	Schaff		461.10 L	459.607 836 L	453.453 L
30	6	Metzen	76.850 L	76.601 306 L	75.575 5 L

33.16.3 Units of Liquid Capacity

In Enns during the fourteenth century

		Metric
Eimer		39.480 L
30	Ortsmass	1.316 L

33.17 Vorarlberg

33.17.1 Units of Length

- 1 **Elle** = 680.363 mm;
 1 **Fuß** (at Dornbirn and in Montafon Valley) = 244.749 mm;

At Dornbirn and in Montafon Valley

		Metric
Schätz-Rute		1.198 996 m
8	Quärtli	149.874 5 mm

For fabrics at Dornbirn and in the Montafon Valley

			Metric
Elle			1.298 912 m
2	Stecken		649.456 mm
8	4	Quart	162.364 mm

At Feldkirch

						Metric
großer Klafter						2.098 18 m
1 $\frac{1}{2}$	kleiner Klafter					1.798 44 m
2 $\frac{2}{3}$	2	Schritt				899.22 mm
7	6	3	Fuß			299.74 mm
84	72	36	12	Zoll		24.98 mm
1,008	864	432	144	12	Linie	2.08 mm

In Kleinwalsertal

		Metric
Klafter		1.843 200 m
6	Fuß	307.200 mm

33.17.2 Units of Area

- 1 **Jauchert** (at Hoffrieden and Sulzberg) = 5394.978 m²;
- 1 **Jauchert** (at Albertschwende and Hofsteig) = 4315.982 4 m²;
- 1 **Pfundlohn-Reben** (at Dornbirn and Feldkirch; 1 Pfund = 240 Pfennig) = 431.598 m²;
- 1 **Guldenlohn-Reben** (at Dornbirn and Feldkirch; 1 Gulden = 220 Pfennig) = 395.631 47 m²;
- 1 **Viertel-Land** (at Altach and Altachhausen) = 242.774 m², but sometimes 323.699 m²;
- 1 **Viertel-Land** (at Koblach and Mäder) = 242.774 m²;
- 1 **Viertel-Land** (at Götzis and Koblach) = 233.063 m², but sometimes 251.766 m²;

At Blundenz, Bregenz and Feldkirch

		Metric
Mannsmahd		3236.988 m ²
4	Mittmal-Boden	809.247 m ²

At Bregenzerwald

				Metric
Winterfuss ^a				3034.674 m ²
4	Klauland			758.668 5 m ²
6	1 $\frac{1}{2}$	Fuss-Land		505.779 m ²
24	6	4	Vierling	126.444 75 m ²

^aIn the village of Au, because of the barren soil, there was also another unit, namely 1 **Kuh-Winterung**= 4046.232 m²

At Dornbirn and Feldkirch

		Metric
Jauchert		3884.388 m ²
12	Viertel-Land	323.699 m ²

In Kleinwalsertal

			Metric
Kuh-Winterung			5394.978 m ²
6000	Quadrat Schritt		89.916 3 dm ²
60,000	10	Quadrat Fuss	8.991 63 dm ²

33.17.3 Units of Volume

1 **Holzklaffer** (for firewood, in Bregenzer Valley, = $6 \times 6 \times 2\frac{1}{2}$ Nürnberger Fuss) = 2.526 003 m³;

1 **Stöckle** (for firewood in Dornbirn, = $6 \times 6 \times 2$ nürnberger Fuss) = 2.020 802 4 m³;

1 **Schlitte** (for firewood in Dornbirn) = 867.997 5 dm³;

For salt at Feldkirch

			Metric
Salz-Viertel			2.846 5 dm ²
4	Vierling		71.162 5 cm ²
16	4	Massl	17.790 6 cm ²

For firewood in Metafon Valley

			Metric
Dornbirner Kubik-Schätzrute			1.723 666 3 m ³
2	Burden		86.183 315 dm ³

33.17.4 Units of Dry Capacity

1 **Salzviertel** (for salt in Feldkirch) = 27.465 L;

1 **Emser** (for lard in Feldkirch) = 24.71 L;

1 **Emser** (for lard in Bergenz) = 21.70 L.

In Bregenz

			Metric
altes Viertel			21.696 L
4	Vierling		5.424 L
16	4	Massl	1.356 L

In Bregenzerwald

			Metric
Vierling			20.679 L
16	Massl		1.292 4 L

In Feldkirch

			Metric
Glatt-Viertel			24.712 875 L
4	Vierling		6.178 219 L
16	4	Massl	1.544 555 L

For barley, corn and oats; and for corn and wheat in Feldkirch

				Metric	Metric
Malter				219.385 L	197.703 L
8	Viertel			27.423 1 L	24.712 9 L
32	4	Vierling		6.855 8 L	6.178 2 L
128	16	4	Massl	1.713 9 L	1.544 5 L

In Lingenau

			Metric
grosses Viertel			29.832 L
4	Vierling		7.458 L
16	4	Massl	1.864 5 L

In Kleinwalsertal and Montafon

				Metric	Metric
Viertel				26.901 L	25.131 L
2	Halbviertel			13.450 5 L	12.565 5 L
4	2	Imme		6.725 25 L	6.282 75 L
20	10	5	Massl	1.345 05 L	1.256 55 L

33.17.5 Units of Liquid Capacity

1 **altes Alp-Mass** (in the Montafon valley) = 1.768 L;

1 **Ortsmass** (in the Kleinwalsertal valley) = 1.592 L;

1 **Ortsmass** (for spirits and honey in the Montafon valley) = 1.242 L;

1 **Ortsmass** (for must in Bregenzerwald) = 1.316 L;

In Bregenz

								Metric
Fuder								1298.88 L
10	Saum							129.888 L
30	3	Eimer						43.296 L
480	48	16	Quart					2.706 L
960	96	32	2	Ortsmass				1.353 L
1920	192	64	4	2	Krügel			676.5 mL
3840	384	128	8	4	2	Schoppe		338.25 mL
7680	768	256	16	8	4	2	Pfiff	169.125 mL

In Feldkirch

								Metric
Fuder								721.920 L
20	Eimer							36.096 L
80	4	Viertel						9.024 L
640	32	8	Ortsmass					1.128 L
1280	64	16	2	Krügel				564 mL
2560	128	32	4	2	Vierteli			282 mL
5120	256	64	8	4	2	Pfiff		141 mL
10,240	512	128	16	8	4	2	Budel	70.5 mL

For regional wine in Bregenz and Feldkirch

				Metric
Fuder				803.120 L
20	Eimer			40.156 L
80	4	Viertel		10.039 L
640	32	8	Ortsmass	1.254 875 L

33.17.6 Units of Weight

1 **Viertel** (for butter and lard in Fontanella) =
10.081 134 kg;

In Bregenz (old scale; after 1839; later sometimes used), Feldkirch (two scales), Hofsteig and Kleinwalsertal (dry commodities and liquids)

		Metric	Metric	Metric	Metric	Metric	Metric	Metric	Metric
Pfund		466.138 g	457.188 g	460.649 g	462.178 g	462.162 g	558.662 g	472.317 g	458.014 g
32	Lot	14.567 g	14.287 g	14.395 g	14.443 g	14.442 g	17.458 g	14.760 g	14.313 g

For butter and lard in the area of the Cathedral of Chur

			Metric
Star			7.806 432 kg
12	Krinne		650.536 g
576	48	Lot	13.552 8 g

In Klostersertal

		Metric
Schwerpfund		914.753 g
64	Lot	14.293 g

In Montafon

			Metric
schweres Pfund^a			975.736 g
4	Vierling		243.934 g
32	8	Lot	30.492 g

^aAccording to [ROTT2], 1 **leichtes Pfund** = 504.843 g and 1 **Wein-Pfund** (for wine) = 840.090 g

33.18 Vienna [G. Wien]

33.18.1 Units of Length

Traditional system in 1547

		Metric
Klafter		1.728 m
6	Fuß	288 mm

Traditional system, as reported in 1588, 1659 and 1673

							Metric
Klafter							1.872 m
6	Fuß						312 mm
9	1½	Spanne					208 mm
72	12	8	Zoll				26 mm
90	15	10	1¼	Fingerbreit			20.8 mm
864	144	96	12	9⅝	Linie		2.17 mm
10,368	1728	1152	144	115⅝	12	Punkte	180.55 µm

Traditional system in 1760

		Metric
Klafter		1.896 614 m
6	Fuß	316.102 3 mm

Traditional system 1871–1876

								Metric
Meile								7585.935 84 m
2000	Ruthe							3.792.967 92 m
4000	2	Klafter						1.896 483 96 m
24,000	12	6	Fuß					316.080 66 mm
288,000	144	72	12	Zoll				26.340 055 mm
576,000	576	288	48	4	Strich			8.780 018 mm
3,456,000	1728	864	144	12	3	Linie		2.195 005 mm
41,472,000	20,736	10,368	1728	144	36	12	Punkte	182.92 µm

33.18.2 Units of Area

1871–1876

					Metric
Joch					5754.642 257 m ²
3	Metzen				1918.214 086 m ²
400	133⅓	Quadrat Ruthe			14.386 606 m ²
1600	533⅓	4	Quadrat Klafter		3.596 651 m ²
57,600	19,200	144	36	Quadrat Fuss	9.990 698 dm ²

33.18.3 Units of Volume

For timber

			Metric
Kubik Klafter			6.820 992 m ³
2	Klafter		3.410 496 m ³
216	108	Kubik Fuss	31.578 665 L

33.18.4 Units of Dry Capacity

Before 1670; from 1670 until 1700

						Metric	Metric
Mut						1310.680 L	1394.547 4 L
31	Metze					42.280 L	44.985 4 L
62	2	Halb-Metze				21.140 L	22.492 7 L
124	4	2	Viertel-Metze			10.570 L	11.246 35 L
248	8	4	2	Achtel-Metze		5.285 L	5.623 17 L
496	16	8	4	2	Massl	2.642 5 L	2.811 59 L

From 1700 until 1752

		Metric
Mut		1402.260 L
30	Metze	46.742 L

From 1752 until 1872

									Metric
Mut									1844.604 6 L
30	Metze								61.486 82 L
60	2	Halb-Metze							30.743 41 L
120	4	2	Viertel-Metze						15.371 70 L
240	8	4	2	Achtel-Metze					7.685 85 L
480	16	8	4	2	Mühl-Massl				3.842 93 L
960	32	16	8	4	2	grosse Massl			1.921 46 L
1920	64	32	16	8	4	2	kleine Massl		960.732 L
3840	128	64	32	16	8	4	2	Becher	480.365 8 L

33.18.5 Units of Liquid Capacity

Before 1359

							Metric
Tafernitz							226.356 L
4	Eimer						56.589 L
16	4	Viertel					14.147 25 L
32	8	2	Stauf or Helbling				7.073 625 L
120	30	7½	3¾	Echterin			1.885 6 L
240	60	15	7½	2	Halbe Echterin		943.150 mL
480	120	30	10	4	2	Quartl	471.575 mL

From 1359 until 1466

							Metric
Eimer							56.589 L
4	Viertel						14.147 249 L
8	2	Stauf					7.073 625 L
35	8¾	4¾	Echterin				1.616 828 5 L
70	17½	8¾	2	Halbe Echterin			808.414 2 mL
140	35	17½	4	2	Quart		404.207 1 mL

From 1466 until 1556

							Metric
Eimer							56.589 L
4	Viertel						14.147 25 L
8	2	Stauf					7.073 625 L
37½	—	—	Echterin				1.509 04 L
75	—	—	2	Halbe Echterin			754.52 mL
150	—	—	4	2	Quart		377.26 mL

From 1557 until 1589

							Metric
Eimer							56.589 L
4	Viertel						14.147 25 L
8	2	Stauf					7.073 625 L
41	10¼	5⅞	Echterin				1.380 219 5 L
82	20½	10¼	2	Halbe Echterin			690.109 6 mL
164	41	20½	4	2	Quart		345.054 8 mL

From 1589 until 1774

							Metric
Eimer							56.589 L
4	Viertel						14.147 25 L
8	2	Stauf					7.073 625 L
42	10½	5¼	Aechtring				1.347 357 1 L
84	21	10½	2	Halbe Aechtring			673.678 5 mL
168	42	21	4	2	Quart		336.839 2 mL

From 1774 until 1875

							Metric
Eimer							56.589 L
4	Viertel						14.147 25 L
40	10	Mass or Ortsmass					1.414 725 L
80	20	2	Halbe Mass				707.362 5 mL
106⅔	26⅔	3⅓	1⅓	Krügel or Grossseitel			530.521 9 mL
160	40	5	2	1½	Seitel		353.681 2 mL
320	80	10	4	3	2	Pfiff or Halbseitel	176.840 6 mL

For wine after 1762

		Metric
Fass		580.037 25 L
10	Eimer	58.003 725 L

For beer after 1775

		Metric
Fass		240.503 25 L
4	Eimer	24.050 325 L

33.18.6 Units of Weight

Traditional upper scale used after 1535

				Metric
Meiler				562.746 kg
10	Zentner			56.274 6 kg
40	4	Meder		14.068 65 kg
1000	100	25	Pfund	562.746 g

Traditional lower scale used after 1535

							Metric
Pfund							562.746 g
2	Mark						281.373 g
8	4	Vierding					70.342 g
12	6	1½	Unze				46.895 g
32	16	4	2⅔	Lot			17.586 g
128	62	16	10⅔	4	Quintel		4.396 g
512	256	64	42¾	16	4	Denar	1.099 g

Traditional system 1704–1756 and after 1756

								Metric	Metric
Zentner								56.164 2 kg	56.006 3 kg
5	Stein							11.232 84 kg	11.201 26 kg
100	20	Pfund						561.642 g	560.063 g
200	40	2	Mark					280.821 g	280.031 g
3200	640	32	16	Lot				17.551 g	17.502 g
12,800	2560	128	64	4	Quintel			4.388 g	4.375 g
51,200	10,240	512	256	16	4	Pfennig		1.097 g	1.094 g
716,800	143,360	7168	3584	224	56	14	Gran	783.5 mg	781.3 mg

For medical use (as reported in 1535, after 1761, according to [ROTT2] and during the late nineteenth century)

						Metric	Metric	Metric
Pfund						334.130 43 g	420.047 25 g	421.056 g
12	Unze					27.844 2 g	35.003 94 g	35.088 g
24	2	Loth				–	–	17.544 g
96	8	4	Drachme			3.480 5 g	4.375 49 g	4.386 g
288	24	12	3	Skrupel		1.160 2 g	1.458 50 g	1.462 g
576	48	24	6	2	Obole	–	–	731 mg
5760	480	240	60	20	10	Gran	–	72.9 mg
								73.1 mg

For gold after 1771

		Metric
Dukat		3.490 2 g
60	Dukaten-As or Dukaten-Gran	58.17 mg

For silver

					Metric
Mark					280.668 3 g
16	Lot				17.541 8 g
64	4	Quentchen			4.385 4 g
256	16	4	Pfennig		1.096 3 g
518	32	8	2	Heller	548.18 mg

34 Austria-Hungary

See *Austria*, *Austrian Littoral*, *Austrian-Silecia*, *Bosnia-Herzegovina*, *Bukovina*, *Croatia*, *Galicia* and *Lodomera*, *Hungary*, *Moldavia*, *Transylvania*, *Tyrol*, *Ukraine*, and *Wallachia*.

34.1 Currency

1892–1918: 1 Austro-Hungarian krone = 100 Heller (in the Austrian part of the Empire) and 100 fillér (in the Hungarian part of the Empire)

35 Austrian Littoral

See also *Austria*, *Italy*, *Kingdom of Illyria*, and *Yugoslavia*.

This area was part of the Austrian Empire from 1813. The Kingdom of Illyria was formed in 1816. From 1820, it included the Duchy of Carinthia, the Duchy of Carniola, and the Austrian Littoral. In 1849, the Kingdom of Illyria ceased to exist and the old crown territories of Carinthia, Carniola, and the Austrian Littoral were re-established. In 1861, the Princely County of Gorizia and Gradisca and the Margravate of Istria became administratively separate entities and, in 1867, Trieste also received separate status, as the Imperial Free City of Trieste. The area was part of Austria-Hungary from 1867 until 1918, when it became part of Italy. After World War II, the area became part of Yugoslavia.

35.1 Units of Length

In Trieste

				Metric
toise				1.908 43 m
1½	passo			1.590 36 m
6	5	pied		318.072 mm
72	60	12	once	26.506 mm

Other measures reported during the nineteenth century:

- 1 **Elle** (in Klagenfurt) = 974.017 mm;
 1 **Elle** (at Krain) = 683.396 mm (for linen before 1857) and 77.558 mm (after 1857);
 1 **Elle** (for silk in Gorizia and Gradisca) = 641.485 mm (before 1857) and 638.686 mm (after 1857);
 1 **Elle** (for wool in Gorizia and Gradisca) = 676.475 mm (before 1857) and 685.396 mm (after 1857);
 1 **aune** (for wool in Trieste) = 676.75 mm;
 1 **aune** (for silk in Trieste) = 642.0 mm.

35.2 Units of Area

In Klagenfurt

				Metric
Tagbau				4315.982 4 m ²
2½	Viertel or Vierling			1726.392 9 m ²
3	1½	Drittel Tagbau or Arl		1438.660 8 m ²
1200	480	400	Vienna Quadrat Klafter	3.596 652 m ²

35.3 Units of Dry Capacity

In Trieste after 1810

		Metric
star		82.610 L
3	polonichi, polonick or poloniko	27.537 L

Other measures reported during the nineteenth century:

- 1 **Schaff** (for coal in Klagenfurt) = 246.018 L.
 1 **stajo** (in Trieste after 1830) = 83.317 2 L;
 1 **polonichi, polonick** or **poloniko** (in Trieste before 1810) = 30.367 6 L.

35.4 Units of Liquid Capacity

For oil in Trieste

		Metric
caffiso		11.94 L
5½	baril	2.17 L

Other measures reported during the nineteenth century:

- 1 **salma** (at Pula) = 150.84 L.

35.5 Units of Weight

In Trieste

					Metric
livre					560.0 g
4	quart				140.0 g
16	4	once			35.0 g
32	8	2	loth		17.5 g
128	32	8	4	quenten	4.4 g

For fine use in Trieste

						Metric
marc						238.499 36 g
8	once					29.812 42 g
32	4	quarta				7.453 10 g
192	24	6	denaro			1.242 18 g
1152	144	36	6	karato		207.03 mg
4608	576	144	24	4	grano	51.76 mg

36 Austrian-Silesia

See *Austria, Bohemia, Czeck Republic, Moravia and Silesia*.

In 1742, the Treaty of Breslau made divided Silesia. Parts of former Upper Silesia now became known as Austrian-Silesia. In 1804, the area became part of the Austrian Empire, and in 1867, a crown land of Cisleithanian Austria. In

1919, the major part of Austrian Silesia was ceded to the newly-created state of Czechoslovakia.

36.1 Units of Length

1 **Elle** (at Krnov before 1756) = 567.617 m.

From 1705 until 1750, from 1750 until 1756 and after 1756

						Metric	Metric	Metric
Rate						4.320 87 m	4.331 68 m	4.340 576 7 m
2½	Klafter					1.728 35 m	1.732 67 m	1.736 230 7 m
7½	3	Elle				576.116 m	577.558 m	578.743 56 mm
15	6	2	Fuss			288.058 mm	288.779 mm	289.371 78 mm
180	72	24	12	Zoll		24.005 mm	24.065 mm	24.114 315 mm
2160	864	288	144	12	Linie	2.000 mm	2.005 mm	2.009 526 mm

In Opava

					Metric
Klafter					1.736 4 m
3	Elle				578.8 mm
6	2	Fuss			289.4 mm
72	24	12	Zoll		24.12 mm

For linen yarn

						Metric
Stück						5530.713 6 m
4	Strenne					1382.678 4 m
12	3	Zaspel				460.892 800 m
240	60	20	Gewind			23.044 640 m
2400	600	200	10	Faden		2.304 464 m
9600	2400	800	40	4	Elle	576.116 mm

For tissue

				Metric
Ganzes Stück				34.566 96 m
1 $\frac{1}{5}$	Stück (long)			28.805 80 m
1 $\frac{1}{2}$	1 $\frac{1}{4}$	Stück (ordinary)		23.044 64 m
60	50	40	Elle	576.116 mm

For cloth

				Metric
Saum				405.585 66 m
2 $\frac{1}{5}$	Ballen			184.357 12 m
22	10	Stück		18.435 712 m
704	320	32	Elle	576.116 mm

36.2 Units of Area

1 **Quadrat-Klafter** (after 1756) = 3.014 496 6 m².

At Krnov before 1756

		Metric
Morgen (30 × 10 Ruten)		5600.975 2 m ²
300	Quadrat-Rute	18.669 917 m ²

36.3 Units of Volume

1 **Stoss** (for shock-wood in Opava before 1769,
10 × 5 Breslauer Ellen) = 50 Breslauer
Kubikellen = 9.560 92 m³;

1 **Holzklaffer** (for wood in Opava after 1769,
10 × 5 Breslauer Ellen) = 50 Breslauer
Kubikellen = 9.560 92 m³.

36.4 Units of Dry Capacity

Troppauer scale in Opava before 1820

					Metric
grosser Malter					1844.580 6 L
12	grosser Scheffel				153.715 05 L
48	4	grosses Viertel			38.428 762 L
192	16	4	grosses Matzl		9.607 191 L
768	64	16	4	grosser Massler	2.401 798 L

Breslauer schlesischer scale and Preussischer schlesischer scale in Opava after 1856

					Metric	Metric
Malter					916.325 772 L	659.549 436 L
12	Scheffel				76.360 481 L	54.962 453 L
48	4	Viertel			19.090 120 L	13.740 613 L
192	16	4	Matzl		4.772 530 L	3.435 153 L
768	64	16	4	Massler	1.193 132 L	858.788 33 mL

Other measures reported during the nineteenth
century:

1 **gross-Metzen** (in Opava after 1820) = 138.345
34 L.

36.5 Units of Liquid Capacity

In Krnov from 1756 until 1772

					Metric
Troppauer Kufe					673.635 5 L
1½	Tonne				561.362 88 L
12	10	Eimer			56.136 288 L
240	200	20	Topf		2.806 814 L
960	800	80	4	Quart	701.704 mL

1 **Fass-Bier** (for beer) = 6 Eimer = 336.817 73 L

Alternative scale in Krnov from 1756 until 1772

					Metric
Preussischer Ohm					137.406 L
2	Preussischer Eimer				68.703 L
4	2	Preussischer Anker			34.351 5 L
120	60	30	Preussischer Quart		1.145 05 L

36.6 Units of Weight

Before 1756

					Metric
Zentner					69.949 836 kg
5½	Stein				12.718 152 kg
132	24	Pfund			529.923 g
4224	768	32	Lot		16.560 g
16,896	3072	128	4	Quentchen	4.140 g

After 1756

					Metric
Saum					154.017 3 kg
2¾	Zentner				56.006 3 kg
13¾	5	Stein			11.201 26 kg
275	100	20	Pfund		560.063 g

Other measures reported during the nineteenth century:

- 1 **Hillern** (for ores) = 3 Zentner = 209.850 kg;
- 1 **Zentner** (for nitre) = 146 Pfund = 77.368 758 kg;
- 1 **Zentner** (for ores) = 132 Pfund = 69.949 836 kg;
- 1 **Lot** (for salt) = 148.766 1 g or 100.635 9 g.

37 Ayutthaya

See *Thailand*.

38 Ayyūbid

See also *Egypt, Mamluk Sultanate, Syria, and Yemen*.

The Ayyūbid dynasty was founded by Saladin (Ṣalāḥ ad-Dīn Yūsuf ibn Ayyūb) in 1171. In 1183, the sultanate included Egypt, Hejaz, northern Mesopotamia, Syria, Yemen, and the North African coast. The dynasty lasted until 1341.

Main source: [MORT2]

38.1 Units of Length

		Metric
dhirā ^c al-yad		462 mm
24	işba ^c	19.25 mm

38.2 Units of Weight

Traditional measure:

1 ħiml = a camel-load.

				Metric
mithqāl				4.704 g
1⅓	dirham			3.528 g
24	18	kharrūbah ^a		196 mg
72	54	3	qamah	65.3 mg

^aThe estimated weight of an average carob seed

integrated into the Achaemenid Empire c. 550 BCE. In 252 CE, the area became part of the Sassanid Empire, and later the Islamic Umayyad Caliphate. Over the course of a few hundred years, the area was dominated by numerous local dynasties. It finally became part of the Great Seljuq Empire, which lasted until the late twelfth century. The Timurids then dominated the area until the early sixteenth century, when Azerbaijan became part of Persia. Under the Turkmenchay treaty of 1828, Persia ceded northern Azerbaijan (what is now Azerbaijan) to Russia. In 1922, it became part of the Federative Union of Soviet Socialist Republics of Transcaucasia. It was part of the Transcaucasia SSR until 1936, when the Azerbaijan SSR was established. Azerbaijan declared its independence from the Soviet Union in 1991.

For brazilwood, cinnamon, frankincense, indigo, and pepper

			Metric ^a	Metric ^b	Metric ^c	Metric ^d	Metric ^e
sporta			217 kg	207.95 kg	216.92 kg	211.31 kg	254.5 kg
5	cantara forfori		43.4 kg	41.59 kg	43.38 kg	42.26 kg	50.9 kg
500	100	raṭl forfori	434 g	415.9 g	433.8 g	422.6 g	509.1 g

^aEstimated value based on 1 sporta = 5 cantari forfori

^bEstimated value based on 1 sporta = 612½ Florentine libber

^cEstimated value based on 1 sporta = 720 Ventian libber sottili

^dEstimated value based on 1 sporta = 666⅔ Genoese libre

^eEstimated value based on 1 sporta = 500 raṭl

39 Azad Jammu and Kashmir

See also *Pakistan*.

This was the Pakistani-administered part of the former princely state of Jammu and Kashmir.

40 Azerbaijan [Formerly: Azerbaijan Soviet Socialist Republic]

See also *Russia*.

During the ninth century BCE, the Scythians settled in this area. The Iranian Medes forged an empire between c. 900—c. 700 BCE, which was

40.1 Currency

2005–: 1 new Azerbaijani manat = 100 qəpik
1992–2005: 1 Azerbaijani manat = 100 qəpik
1924–1991: 1 Soviet ruble = 100 kopeks
1923–1924: 1 Transcaucasian ruble
1919–1922: 1 Azerbaijani manat
1918–1919: 1 Transcaucasian ruble
1828–1917: 1 Russian ruble = 100 kopeks
–1828: 1 Iranian toman = 10 kran = 10,000 dinars

In Shamakhi

tuman		
10	sachibkiran	
50	5	abasa or kabasa

40.2 Units of Length

At Talış

		Metric
arschin		1.015 983 7 m
16	girä	63.499 mm

Other reported measures:

1 **arschin** (at Nukha, present-day Shaki) = 888.99 mm;

1 **arschin** (in Shamakhi) = 497.83 mm.

40.3 Units of Area

At Nukha (present-day Shaki)

		Metric
ip		2845.091 6 m ²
3600	arschin ²	79.030 3 dm ²

40.4 Units of Capacity

Both dry and liquid commodities were usually sold by weight.

For dry commodities in Shamakhi

			Metric
meidan-batman			8.190 231 kg
20	funt		409.512 g
24	1½	stil	341.260 g

For liquids in Shamakhi

			Metric
misan-batman			4.095 12 kg
10	funt		409.512 g
12	1½	stil	341.260 g

For wheat at Talış

				Metric
girä ^a				102.377 89 kg
10	gous			10.237 789 kg
25	2½	batman		4.095 116 kg
250	25	10	funt	409.512 g

^aAlso reported as 240 funt = 98.282 88 kg

For barley and oats at Talış

		Metric
girä ^a		85.997 52 kg
210	funt	409.512 g

^aAlso reported as 200 funt = 81.902 4 kg

Other reported measures:

1 **schagar** (for wheat in Shamakhi) = 1000 funt = 409.511 56 kg;

1 **schagar** (for barley and oats in Shamakhi) = 800 funt = 317.609 25 kg;

1 **chalcä** = 1.75 L.

40.5 Units of Weight

In Northern Caucasus

		Metric
chalwar		6 388.4 kg
50	batman	127.768 kg

At Nukha (present-day Shaki)

		Metric
scheki-batman		16.752 745 6 kg
48	meidan-stil	349.015 g

Other reported measures:

1 **dartu** = 3 funt = 1.228 534 68 kg;

1 **stil otar** = 163.253 363 g.

For gold and silver

			Metric
miskal			4.653 54 g
1½	solotnik		4.265 745 g
24	22	nakuht	193.897 mg

41 Azores

See also *Portugal*.

The Azores are a group of nine islands of volcanic origin, including Angra, Horta and Ponta Delgada. The Azores were discovered c. 1427 by the Portuguese navigator Diago de Silves. The

islands were subject to Spain from 1580 until 1640, and to Portugal after 1640. The Azores have been an autonomous region within Portugal since 1976.

The metric system has been compulsory since 1852.

41.1 Currency

2002–: 1 euro = 100 euro-cents

1911–2002: 1 Portuguese escudo = 100 centavos

–1911: 1 Milreis = 1000 Reis

41.2 Units of Dry Capacity

In Ponta Delgada and São Miguel

				Metric	Metric
fanga				47.92 L	48.56 L
4	alqueire			11.98 L	12.14 L
8	2	meio		5.99 L	6.07 L
16	4	2	quarto	2.995 L	3.035 L

At Angra do Heroísmo, Vila de São Sebastião, and Villa da Calheta

								Metric	Metric	Metric
moio								792 L	828 L	878.40 L
15	fanga							52.80 L	55.20 L	58.56 L
60	4	alqueire						13.20 L	13.80 L	14.64 L
240	16	4	quarta					3.30 L	3.45 L	3.66 L
480	32	8	2	oitava				1.65 L	1.725 L	1.83 L
960	64	16	4	2	maquia			825 mL	862.5 mL	915 mL
1920	128	32	8	4	2	selamim		412.5 mL	431.25 mL	457.5 mL
3840	256	64	16	8	4	2	meio selamim	206.25 mL	215.625 mL	228.875 mL

At Villa da Praia na Graciosa, Villa da Praia da Victoria, and Villa de Santa Cruz

								Metric	Metric	Metric
moio								809.46 L	814.50 L	816 L
15	fanga							53.964 L	54.30 L	54.40 L
60	4	alqueire						13.491 L	13.575 L	13.60 L
240	16	4	quarta					3.372 75 L	3.393 75 L	3.40 L
480	32	8	2	oitava				1.686 375 L	1.696 875 L	1.70 L
960	64	16	4	2	maquia			843.187 5 mL	848.437 5 mL	850 mL
1920	128	32	8	4	2	selamim		421.593 75 mL	424.218 75 mL	425 mL
3840	256	64	16	8	4	2	meio selamim	210.796 875 mL	212.109 375 mL	212.50 mL

At Villa do Topo and Villa das Vélas

								Metric	Metric
moio								849 L	855 L
15	fanga							56.60 L	57 L
60	4	alqueire						14.15 L	14.25 L
240	16	4	quarta					3.537 5 L	3.562 5 L
480	32	8	2	oitava				1.768 75 L	1.781 25 L
960	64	16	4	2	maquia			884.375 mL	890.625 mL
1920	128	32	8	4	2	selamim		442.187 5 mL	445.312 5 mL
3840	256	64	16	8	4	2	meio selamim	221.093 75 mL	222.656 25 mL

41.3 Units of Liquid Capacity

At Angra do Heroísmo, Vila de São Sebastião, and Villa da Calheta

								Metric	Metric	Metric
tonel								1100 L	1112.50 L	1220 L
2	pipa							550 L	556.25 L	640 L
50	25	almude						22 L	22.25 L	24.40 L
100	50	2	pote					11 L	11.125 L	12.20 L
500	250	10	5	canada				2.2 L	2.225 L	2.44 L
2000	1000	40	20	4	quartilho			550 mL	556.25 mL	610 mL
4000	2000	80	40	8	2	meio quartilho		275 mL	278.125 mL	305 mL
8000	4000	160	80	16	4	2	quarto de quartilho	137.5 mL	139.062 5 mL	152.5 mL

At Villa da Praia na Graciosa, Villa da Praia da Victoria, and Villa de Santa Cruz

								Metric	Metric	Metric
tonel								1215 L	1127.5 L	1200 L
2	pipa							607.5 L	563.75 L	600 L
50	25	almude						24.30 L	22.55 L	24 L
100	50	2	pote					12.15 L	11.275 L	12 L
500	250	10	5	canada				2.43 L	2.255 L	2.4 L
2000	1000	40	20	4	Quartilho			607.5 mL	563.75 mL	600 mL
4000	2000	80	40	8	2	meio quartilho		303.75 mL	281.875 mL	300 mL
8000	4000	160	80	16	4	2	quarto de quartilho	151.875 mL	140.937 5 mL	150 mL

At Villa do Topo and Villa das Vêlas

								Metric	Metric
tonel								1210 L	1188 L
2	pipa							605 L	594 L
50	25	almude						24.20 L	23.76 L
100	50	2	pote					12.10 L	11.88 L
500	250	10	5	canada				2.42 L	2.376 L
2000	1000	40	20	4	quartilho			605 mL	594 mL
4000	2000	80	40	8	2	meio quartilho		302.5 mL	297 mL
8000	4000	160	80	16	4	2	quarto de quartilho	151.25 mL	148.5 mL

42 Bahamas (Commonwealth of The Bahamas)

See also *United Kingdom*.

These islands were discovered by Columbus in 1492. As Spain made no attempt to settle

the islands, British influence began in 1626. In 1783, the islands became part of the British Commonwealth. Independence was declared in 1973.

The metric system is used, along with the British Imperial system to some degree.

42.1 Currency

1966–:	1 Bahamas dollar = 100 cents
1936–1966:	1 Bahamas pound = 20 shillins = 240 pence
1869–1936:	1 pound sterling = 20 shillings = 240 pence

43.1 Currency

1965– :	1 Bahraini dinar = 1000 fils
1959–1965:	1 Persian Gulf rupee = 100 naye paise
–1959:	1 Indian rupee = 16 anna = 192 pies
	1 Maria Theresa thaler

43 Bahrain [Formerly: Dilmun, Awal, Mishmahig]

See also *Dilmun* (in the Ancient Systems of units section), *Portugal*, and *United Kingdom*.

Bahrain was under Arab control from the 700s until 1507, when Portugal seized it. In 1602, the Persians took control of Bahrain. In 1783, Ahmad ibn Al Khalifah ousted the Persians. In 1820, the representatives of the British government signed a general peace treaty with the Sheik of Bahrain and other sheiks on the Pirate Coast, later renamed the Trucial Coast. A Treaty of Exclusive Relations was signed with Bahrain in 1880. Independence was attained in 1971.

The metric system has been official since 1969, and has been used for conversion from the Imperial system since 1978.

Main sources: [UN55] and [UN66]

43.2 Units of Length

1 **dhara** = 19 in = about 48.26 cm.

43.3 Units of Weight

Traditional upper scale

				Metric
rafa				260.26 kg
10	man			26.026 kg
140	14	roba or rubaa		1.859 kg
560	56	4	ratl or rotl	464.75 g

Imperial upper scale

				Imperial	Metric
rafa				560 lb	254.01 kg
10	maund			56 lb	25.401 kg
140	14	roba or rubaa		4 lb	1.814 kg
560	56	4	ratl or rotl	1 lb	453.59 g

Imperial lower scale

					Imperial	Metric
ratl or rotl					1 lb	453.59 g
$9\frac{7}{18}$	miskal bar					46.656 g
38%	4	tola			180 gr	11.664 g
97%	10	$2\frac{1}{2}$	miskal			4.665 6 g
7000	720	180	72	grain	1 gr	64.799 mg

44 Baker Island

This is one of the United States’ Minor Outlying Islands. The only human population consists of temporarily stationed scientific and military personnel.

At Port Mahon

			Metric
canna			1.604 m
8	palmo		200.500 mm
32	4	cuartillo	50.125 mm

Other reported measures:

1 **legua** (at Palma) = 8,282 varas di Castiglia = 6922.965 210 m;

1 **destre, destre Mallorquin, or dextre** (for agricultural use) = 4.214 000 m.

45 Balearic Islands

See also *Spain*.

The four largest islands in this system are Majorca, Minorca, Ibiza, and Formentera. In the late 1200s, the islands were an independent kingdom, but in the 1300s, they became part of Aragon and Spain. The British ruled Minorca during the 1700s, but in 1802, the island again fell under Spanish rule.

Main sources: [CARD], [DOUR], and [MART3]

45.1 Currency

Majorca:

1 peso = 8 reales = 128 quartos = 272 maravedis
1 libra de Mallorca = 10 reales = 20 sueldos =
128 quartos = 240 dineros

Minorca and Ibiza:

1 libra = 20 sueldos = 240 denari

45.2 Units of Length

Traditional system (Majorca and Minorca)

					Metric	Metric
cana or canna					1.564 m	1.603 9 m
2	media cana or media canna				782.000 mm	801.929 mm
6	3	pie			260.670 mm	267.310 mm
8	4	1⅓	palmo		195.500 mm	200.482 mm
32	16	5⅓	4	cuarto	48.875 mm	50.120 mm

45.3 Units of Area

Traditional system (Majorca and Minorca)

			Metric	Metric
cana cuadrada			2.446 096 m ²	2.572 495 21 m ²
4	media cana cuadrada		61.152 4 dm ²	64.312 380 25 dm ²
36	9	píe cuadrada	6.794 71 dm ²	7.145 82 dm ²

Castilian scale (Majorca)

							Metric
jovada							113,649.894 4 m ²
16	cuarterada						7103.118 4 m ²
64	4	corton					1775.779 6 m ²
256	16	4	huerto				443.944 9 m ²
6400	400	100	25	destre or dextre			17.757 796 m ²
162,560	10,160	2540	635	25 ³ / ₅	vara cuadrada de Burgos		69.912 582 7 dm ²
1,463,040	91,440	22,860	5715	228 ³ / ₅	9	píe cuadrada de Burgos	7.768 064 7 dm ²

45.4 Units of Volume

1 **media cana cúbica** (Balearic Islands) =
47.821 176 8 dm³.

45.5 Units of Dry Capacity

1 **modino** (for salt at Port Mahon) = 932.48 L.

Traditional system (Majorca and Minorca) and at Port Mahon

			Metric	Metric	Metric	Metric
cuartera			71.97 L	75.98 L	75.992 2 L	74.406 000 L
6	barcella		11.995 L	12.66 L	12.665 L	12.401 000 L
36	6	almude	1.999 L	2.110 5 L	2.110 9 L	2.066 833 L

Traditional system (other Balearic Islands)

						Metric
cuartera						70.340 L
2	media cuartera					35.17 L
6	3	barcella				11.723 L
12	6	2	cuartan			5.861 7 L
36	18	6	3	almud		1.953 9 L
144	72	24	12	4	cuarto	488.472 mL

For cereals at Palma

			Metric
cuartera			70.344 000 L
6	barcella		11.724 000 L
36	6	almud	1.954 000 L

For salt at Palma

		Metric
lastre		1 398.381 696 L
1½	modin	932.254 464 L

For wine at Palma (Majorca)

					Metric
carga					81.120 000 L
4	cortin				20.280 000 L
26	6½	cuartera or quartés			3.120 000 L
104	26	4	cuarta		780.000 mL
208	52	8	2	corton or porron	390.000 mL

45.6 Units of Liquid Capacity

Old scale, based on [CARD]

			Metric
quartera			71.97 L
6	barcella		11.995 L
36	6	almude	1.999 2 L

Traditional system (Majorca)

					Metric
pelexo					325.53 L
3	carga				108.51 L
12	4	cuartin			27.13 L
72	24	6	quartés		4.521 L
288	96	24	4	quarta	1.130 L

For brandy (Majorca)

				Metric
cortin				26.240 000 L
2⅔ ₁₃	arroba			10.660 000 L
64	26	libra		410.000 mL
128	52	2	media libra	205.000 mL

For oil (Majorca and other Balearic Islands)

							Metric	Metric
pipa							447.660 000 L	437.967 000 L
4½	carga						99.480 000 L	97.326 000 L
9	2	odre, pellejo, or pelexo					49.740 000 L	48.663 000 L
27	6	3	mesura				16.580 000 L	16.221 000 L
108	24	12	4	cuartan or cortan			4.145 000 L	4.055 250 L
432	96	48	16	4	cuarto		1.036 250 L	1.013 812 L
1728	384	192	64	16	4	cuarta	259.062 mL	253.453 mL

Traditional upper scale (Minorca)

						Metric
botta or bota menor						503.40 L
1⅓	pipa					314.625 L
4	2½	carga				125.85 L
16	10	4	barillo			31.462 L
22	13¾	5½	1⅔	cuartillo		22.882 L
64	40	16	4	2 ¹⁹ / ₁₁	gerrah or gerra	7.866 L

Traditional lower scale (Minorca)

					Metric
gerrah or gerra					7.866 L
2	cuartera				3.933 L
3	1½	quartés			2.622 L
4	2	1⅓	media cuartera		1.966 L
12	6	4	3	quarta	655.47 mL

At Port Mahon

							Metric
bota menor							503.400 000 L
1 ⁷³ / ₁₆₈₇	pipa de vino						482.520 000 L
4	3 ³⁶⁷ / ₄₄₀	carga					125.850 000 L
16	15 ³⁷ / ₁₁₀	4	barillo				31.462 500 L
—	40	—	—	gerra			12.063 000 L
—	80	—	—	2	cuartera		6.031 500 L
88	84 ⁷ / ₂₀	22	5½	—	—	cuartillo	5.720 455 L

45.7 Units of Weight

								Metric
cargo								127.296 kg
2	cantaro							63.648 kg
2 ⁷ / ₂₅	1½	cantaro barbaresco						40.80 kg
8⅔	4⅓	4⅓	misura					14.688 kg
12	6	5 ¹⁰ / ₁₃	1⅓	arroba				10.608 kg
34⅔	17⅓	16⅔	4	2⅘	corta or quartano			3.672 kg
104	34⅔	33⅓	12	8⅘	3	libra major		1.224 kg
312	104	100	36	26	9	3	rotolo	408.000 g

Traditional system (Majorca)

									Metric
tonelada									846.560 kg
6⅔	carga								126.984 kg
20	3	quintal or cántaro mallorquin							42.328 kg
80	12	4	arroba						10.582 kg
693⅓	104	34⅔	8⅔	libra carnicera					1.221 kg
2080	312	104	26	3	rotolo or libra corta				407.000 g
24,960	3744	1248	312	36	12	onza			33.917 g
99,840	14,976	4992	1248	144	48	4	cuarto		8.479 g
399,360	59,904	19,968	4992	576	192	16	4	adarme	2.120 g

At Palma (Majorca)

					Metric
carga					122.100 000 kg
3	quintal or cántaro berberisco				40.700 000 kg
12	4	arroba			10.175 000 kg
300	100	25	rotolo		407.000 g
3600	1200	300	12	onza	33.917 g

Rotoli-scale (Majorca)

				Metric
oder				45.458 kg
$1\frac{3}{25}$	quintal			40.587 kg
$4\frac{13}{25}$	4	arroba		10.147 kg
112	100	25	rotoli barbaresco	405.87 g

Rotoli-scale (Minorca)

			Metric
carga			111.21 kg
3	quintal		37.071 kg
300	100	rotoli barbaresco	370.707 g

Libra-scale (Minorca)

							Metric
cantaro							40.006 85 kg
$33\frac{1}{3}$	libra mayor						1.202 055 kg
100	3	libra					400.685 g
1200	36	12	onza				33.390 g
4800	144	48	4	cuarta			8.348 g
19,200	576	192	16	4	argenso		2.087 g
691,200	20,736	6912	576	144	36	grano	57.97 mg

At Port Mahon, based on [MART3]

									Metric
carga									125.112 000 kg
3	quintal								41.704 000 kg
12	4	arroba							10.426 000 kg
104	$34\frac{2}{3}$	$8\frac{2}{3}$	libra mayor						1.203 000 kg
312	104	26	3	libra					401.000 g
468	156	39	$4\frac{1}{2}$	$1\frac{1}{2}$	marco				267.333 g
3744	1248	312	36	12	8	onza			33.417 g
14,976	4992	1248	144	48	32	4	cuarto		8.354 g
59,904	19,968	4992	576	192	128	16	4	argenso	2.088 g
2,156,544	718,848	179,712	20,736	6912	4608	576	144	36	grano 58 mg

46 **Bamana Empire or Bambara Empire**

See also *Mali*, *Morocco*, and *Toucouleur Empire*.

This empire was established by Bitòn Mamary Coulibaly (c. 1689–1755) in 1712. In 1861, the population was forced to convert to Islam by the Toucouleur conqueror El Hadj Umar Tall (c. 1797–1864), and the area became part of the Toucouleur Empire.

47 **Banda Oriental**

See *Uruguay*.

48 **Bangladesh [Formerly: East Pakistan]**

See also *India*, *Pakistan* and *United Kingdom*.

In 1338, Bengal, a region that includes Bangladesh, was able to separate itself from the Delhi sultanate and remain independent until its conquest by the Mughals in 1576. By 1772, the British had gained control over all of Bengal and the area became part of British India. Pakistan gained its independence from British India in

1947, and East Bengal became East Pakistan. East Pakistan declared its independence as the People’s Republic of Bangladesh and seceded from Pakistan in 1971.

Different districts had their own measuring systems, greatly varying in nomenclature and measuring units, before the British colonization. During the late eighteenth century, the British Imperial system began to influence the systems of weights and measures. Many local measurement scales became linked to the British Imperial system. The Government of Bangladesh introduced the metric system beginning in 1982 through an Ordinance.

Main sources: [BENG], [HUNT6], [ISLA], [NOKI], [SHAS], and [UN66]

48.1 **Currency**

1972–:	1 Bangladesh taka = 100 poisha
1948–1972:	1 Pakistan rupee = 100 paise
c. 1850–1948:	1 Indian rupee = 16 anna = 64 pice = 192 pies

48.2 **Units of Length**

Imperial scale

									Imperial	Metric
yoyan, yoyana, or bhari									7200 yd	6583.68 m
2½ ₂₂	crosh or crush								2 mi	3218.688 m
4¼ ₁₁	2	mile							1 mi	1609.344 m
32¾ ₁₁	16	8	furlong						220 yd	201.168 m
7200	3520	1760	220	gâz or yarda					1 yd	914.4 mm
14,400	7040	3520	440	2	hath				18 in	457.2 mm
21,600	10,560	5280	660	3	1½	foot			12 in	304.8 mm
115,200	56,320	28,160	3520	16	8	5⅓	gira		2¼ in	57.15 mm
259,200	126,720	63,360	7920	36	18	12	2¼	inch	1 in	25.4 mm

48.3 Units of Area

Imperial scale

	बीघा	कट्ठा	Imperial	Metric
acre			1 acre	4047 m ²
3	bigha, biga, or biggah		1/3 acre	1349 m ²
60	20	katha	80⅔ yd ²	67.448 m ²

48.4 Units of Liquid Capacity

British Imperial scale

		Metric
gallon		4.546 L
8	pinta	568.26 mL

48.5 Units of Weight

For general use

								Metric
mon or maund								37.324 kg
8	punshuri							4.666 kg
40	5	seer^a						933.10 g
160	20	4	powa					233.28 g
640	80	16	4	chhatak				58.319 g
2560	320	64	16	4	khanchaa^b or powa chhatak			14.580 g
3200	400	80	20	5	1¼	tola		11.664 g
12,800	1600	320	80	20	5	4	siki	2.916 g

^aUsually used for rice

^bAs 1 “factory” **khanchaa** = 10/11 khanshaa = 13.254 g

British Imperial scale

				तोला		Imperial	Metric
mon or maund						80 lb	36.287 kg
8	punshuri					10 lb	4.536 kg
160	20	powa				½ lb	226.796 g
640	80	4	chhatak				56.699 g
3200	400	20	5	tola			11.340 g
12,800	1600	80	20	4	siki		2.835 g

For precious metals

	तोला	माशा					Metric
seer							933.10 g
80	bhari or tola						11.664 g
960	12	masha					971.98 mg
1280	16	1⅓	anna				728.98 mg
7680	96	8	6	rati			121.50 mg
30,720	384	32	24	4	dhan		30.37 mg
64,000	800	66⅔	50	8⅓	2⅓ ₁₂	nely	14.58 mg

Other measures reported during the twentieth century:

1 **bale** (for jute) = 180 kg;

1 **bale** (for cotton) = 178.81 kg.

48.6 Barisal Division

48.6.1 Units of Quantity

1 **kuri** (for betel nuts at Barisal) = 22.

48.6.2 Units of Area

British Imperial-linked system at Barisal

				चटक	Imperial	Metric
kura					1½ acres	6 475.20 m ²
8	kati				1/5 acre	809.40 m ²
80	10	korha			1/50 acre	80.94 m ²
160	20	2	decimal		1/100 acre	40.47 m ²
320	40	4	2	ganda	1/200 acre	20.23 m ²

48.6.3 Units of Liquid Capacity

For kerosene oil at Barisal

तोला		Metric
tola		1.55 kg
3/5	seer	933 g

48.6.4 Units of Weight

At Barisal

		Metric
kathi		20.53 kg
22	seer	933 g

48.7 Chittagong Division

48.7.1 Units of Quantity

1 **bira** (for betel leaves at Noakhali) = 72;

1 **kuri** (for bananas and fish at Comilla) = 25;

1 **kuri** (for bananas at Lakshmipur) = 24;

1 **ganda** (at Noakhali) = 4.

48.7.2 Units of Area

British Imperial-linked system at Chittagong

				चटक			Imperial	Metric
maund								8741.52 m ²
1½ ₂₀	kani							6475.20 m ²
4	2½ ₂₇	ari						2185.38 m ²
27	20	6¾	ganda					323.76 m ²
72	53⅓	18	2⅔	seer				121.41 m ²
108	80	27	4	1½	korha			80.94 m ²
216	160	54	8	3	2	decimal	1/100 acre	40.47 m ²

British Imperial-linked system at Comilla

चटक				Imperial				Metric
sai kani								7284.60 m ²
1½	kani							4856.40 m ²
4	2⅔	kuni						1821.15 m ²
20	13⅓	5	ganda					364.23 m ²
60	40	15	3	seer				121.41 m ²
80	53⅓	20	4	1⅓	korha			91.06 m ²
180	120	45	9	3	2¼	decimal		1/100 acre
960	640	240	48	16	12	5⅓	chatak	7.59 m ²

British Imperial-linked system at Feni and Lakshmipur

चटक				Imperial				Metric
dron								15,540.48 m ²
3⅓	tirpi kani							1⅓ acres
8	2½	ari						1942.56 m ²
16	5	2	kani					971.28 m ²
64	20	8	4	ganda or kuni				242.82 m ²
128	40	16	8	2	seer			121.41 m ²
256	80	32	16	4	2	korha		60.70 m ²
384	120	48	24	6	3	1½	decimal	1/100 acre

British Imperial-linked system at Noakhali

चटक		Imperial		Metric
kani				1⅓ acres
20	ganda			3/50 acre
80	4	korha		60.70 m ²
120	6	1½	decimal	1/100 acre

48.7.3 Units of Weight

At Noakhali

		Metric
mon		37.2 kg
40	seer	931 g

1 **ganda** (at Faridpur) = 16;1 **hali** (at Gazipur) = 5;1 **hali** (for mangoes at Tangail) = 5;1 **ganda** (at Dhaka) = 4;1 **hali** (at Faridpur) = 4.

48.8.2 Units of Area

British Imperial scale at Dhaka

बीघा	कट्ठा			Imperial	Metric
bigha				39/50 acre	3 156.66 m ²
1½	katha			13/25 acre	2 104.44 m ²
3	2	pakhi		13/50 acre	1 052.22 m ²
78	52	26	decimal	1/100 acre	40.47 m ²

48.8 Dhaka Division

48.8.1 Units of Quantity

1 **hundred** (for mangoes at Dhaka) = 112;1 **pon** (at Faridpur) = 80;1 **bira** (for betel leaves at Dhaka) = 80;1 **bisha** (for fish at Dhaka) = 32;1 **kuri** (for fish at Tangail) = 22;1 **choli** (at Dhaka) = 20;

British Imperial-linked system at Faridpur

বীঘা			Imperial	Metric
bigha			13/25 acre	2 104.44 m ²
17 ¹ / ₃	seer or ghati		3/100 acre	121.41 m ²
52	3	decimal	1/100 acre	40.47 m ²

British Imperial-linked system at Gazipur

বীঘা		Imperial	Metric
bigha or pakhi			1416.45 m ²
35	decimal	1/100 acre	40.47 m ²

British Imperial-linked system at Mymensingh

বীঘা	কড়া			Imperial	Metric
bigha					1335.51 m ²
5	katha				267.10 m ²
11	2 ¹ / ₅	seer			121.41 m ²
30	6	2 ³ / ₁₁	pura		44.52 m ²
33	6 ³ / ₅	3	1 ¹ / ₁₀	decimal	1/100 acre

British Imperial-linked system at Netrakona

			কড়া			Imperial	Metric
pura							103,603.2 m ²
16	ara						6475.2 m ²
51 ¹ / ₅	3 ¹ / ₅	butha					2023.5 m ²
76 ²⁸ / ₆₇	4 ⁵² / ₆₇	1 ³³ / ₆₇	kani				1355.7 m ²
256	16	5	3 ⁷ / ₂₀	katha		1/10 acre	404.7 m ²
1024	64	20	13 ³ / ₅	4	kuchi	1/40 acre	101.17 m ²
2560	160	50	33 ¹ / ₂	10	2 ¹ / ₂	decimal	1/100 acre

British Imperial-linked system at Tangail

	বীঘা		চটক		Imperial	Metric
khada					4 ¹ / ₅ acre	19,425.6 m ²
16	bigha or pakhi				3/10 acre	1214.1 m ²
32	2	korha			3/20 acre	607.05 m ²
64	4	2	ganda		3/40 acre	303.525 m ²
480	30	15	7 ¹ / ₂	decimal	1/100 acre	40.47 m ²

48.8.3 Units of Volume

For fuel wood at Gazipur

maund	
10	pahar

48.8.4 Units of Weight

For milk at Gazipur

	তোলা	Metric
Seer		933 g
105	tola	8.9 g

For rice at Gazipur

		Metric
khata		4.66 kg
5	seer	933 g

At Tangail

	তোলা	Metric
seer^a		933 g
80	tola	11.7 g

^aFor milk = 105 tola

48.9 Khulna Division

48.9.1 Units of Quantity

1 **par** (at Kushtia) = 80.

48.9.2 Units of Area

At Khulna

कठ्ठा	बीघा					Imperial	Metric
katha							3642.30 m ²
1 $\frac{1}{11}$	bigha					66/100 acre	2671.02 m ²
2	1 $\frac{1}{15}$	chunia					1821.15 m ²
6	4 $\frac{1}{5}$	3	dhari				607.05 m ²
30	22	15	5	seer			121.41 m ²
90	66	45	15	3	decimal	1/100 acre	40.47 m ²

At Kushtia

	बीघा		Imperial	Metric
acre			—	4046.97 m ²
1 $\frac{1}{3}$	pakhi		—	2428.2 m ²
3 $\frac{1}{33}$	1 $\frac{1}{11}$	bigha	33/100 acre	1335.5 m ²
100	60	33	decimal	1/100 acre

48.9.3 Units of Weight

At Kushtia

		Metric
dhari		4.65 kg
5	seer	931 g

48.10 Rajshahi Division

48.10.1 Units of Quantity

1 **poa** (for betel leaves at Rajshahi) = 2,048;

1 **pon** (at Rajshahi) = 80;

1 **bira** (at Rajshahi) = 64;

1 **gha** (for betel nuts at Pabna) = 10;

1 **ganda** (for mangoes at Rajshahi) = 4.

48.10.2 Units of Area

British Imperial-linked system at Bogra

बीघा		का		Imperial	Metric
bigha				33/100 acre	1335.4 m ²
11	seer			3/100 acre	121.4 m ²
20	1 $\frac{1}{11}$	katha			66.77 m ²
33	3	1 $\frac{1}{50}$	decimal	1/100 acre	40.47 m ²

British Imperial-linked system at Pabna

बीघा			Imperial	Metric
bigha ^a				1335.51 m ²
1 $\frac{1}{5}$	Pakhi			1092.69 m ²
33	27	decimal	1/100 acre	40.47 m ²
35 $\frac{1}{5}$	29	29/27	kani	37.68 m ²

^aAlso reported as 1/5 acre = 809.39 m²

British Imperial-linked system and traditional system at Rajshahi

बीघा	का		Imperial	Metric
bigha ^a			33/100 acre	1335.51 m ²
20	katha			66.77 m ²
33	1 $\frac{1}{20}$	decimal	1/100 acre	40.47 m ²

^aAlso reported as 1/5 acre = 809.39 m²

48.10.3 Units of Dry Capacity

For rice at Bogra

		Metric
kati		18.66 kg
4	dhara	4.66 kg
20	5	seer

48.10.4 Units of Weight

1 **dhari** (at Rajshahi) = 5 kg.

At Rajshahi

		Metric
maund		37.3 kg
40	seer	933 g

48.11 Rangpur Division

48.11.1 Units of Quantity

1 **hundred** (for betel leaves at Dinajpur) = 64;

1 **gha** (for betel nuts at Dinajpur) = 10;

1 **hali** (for fish at Rangpur) = 7;

1 **ganda** (at Dinajpur) = 4.

48.11.2 Units of Area

British Imperial-linked system at Dinajpur

বীঘা	কড়া		Imperial	Metric
bigha			12/25 acre	1942.55 m ²
20	katha			97.13 m ²
48	2 ² / ₅	decimal	1/100 acre	40.47 m ²

British Imperial-linked system at Gaibandha

বীঘা	কড়া		Imperial	Metric
bigha ^a			33/100 acre	1335.51 m ²
20	katha			66.77 m ²
33	1 ⁷ / ₂₀	decimal	1/100 acre	40.47 m ²

^aAlso reported as 1/5 acre = 809.39 m²

British Imperial-linked system at Rangpur

বীঘা				Imperial	Metric
bigha				3/5 acre	2428.2 m ²
2 ¹ / ₂	doan			6/25 acre	971.28 m ²
10	4	poa		3/50 acre	242.82 m ²
60	24	6	decimal	1/100 acre	40.47 m ²

Other reported measures:

1 **bísí** (in Rangpur) = 16 dhans = 46.2 m².

48.11.3 Units of Weight

At Dinajpur

			Metric
maund			40 kg
8	dhari		5 kg
40	5	seer	1 kg

At Gaibandha

			Metric
maund			37.24 kg
40		seer	931 g

At Rangpur

			Metric
mon			37.24 kg
8	dhara		4.65 kg
40	5	seer	931 g

48.12 Sylhet Division

48.12.1 Units of Length

Government standard

		Metric
nál		6.59 m
12	háth	549.3 mm

48.12.2 Units of Area

Government standard based on a háth = 21 5/8 inches

							चटक			Metric
hál or kulbá										14,597.599 m ²
4	chauk									3649.400 m ²
12	3	kiar or kidár								1216.467 m ²
48	12	4	poyá							304.117 m ²
336	84	28	7	jait ^a						43.455 m ²
1344	336	112	28	4	rek					10.861 m ²
5376	1344	448	112	16	4	pan				2.715 m ²
107,520	26,880	8960	2240	320	80	20	ganda			13.58 dm ²
430,080	107,520	35,840	8960	1280	320	80	4	kauri		3.39 dm ²
1,290,240	322,560	107,520	26,880	3840	960	240	12	3	kránti	1.13 dm ²

^aAs the háth varied in different parts of the district between about 400 and 555 mm, the quantity of land in a jait (= 144 square háths) varied considerably

48.12.3 Units of Weight

For brass, ghee, salt, rice, and oil at bazaars; Government standard, based on 1 man = 82 lbs av.

					तोला			Metric	Metric
man or maund								37.44 kg	37.194 kg
8	pasuri							4.68 kg	4.649 kg
40	5	seer						930.0 g	929.85 g
160	20	4	poyá					234.0 g	232.25 g
640	80	16	4	chhaták				58.5 g	58.12 g
3200	400	80	20	5	káchhá, rupee, or tola			11.7 g	11.62 g
16,000	2000	400	100	25	5	sikki		2.34 g	2.32 g
307,200	38,400	7680	1920	480	96	19 1/5	ruttie	121.875 mg	121.074 mg

1848–1935: 1 pound sterling = 20 shillings =
240 pence = 960 farthings
1 US dollar = 100 cents

49 Barbados

See also *United Kingdom*.

In 1563, this coral island was named by a Portuguese explorer. Barbados became a British colony in 1627. The Windward Islands were established in 1833, and included Barbados, Grenada, St. Vincent, and Tobago. St. Lucia joined the Winward Islands in 1838. Barbados was granted internal self-government in 1961, and became independent in 1966.

The early weights and measures were based on the English system, as it was used in Jamaica. In 1891, the Weights and Measures Act of Barbados stated that the standard of weights, linear and superficial measures was the same as that in the United Kingdom. The standard measure for liquids was the U.S. liquid gallon, equal to 231 cu in. The metric system has been official since 1973.

Main sources: [SANG2] and [UN66]

49.1 Currency

1973–: 1 Barbadian dollar = 100 cents
1965–1973: 1 East Carribbean dollar = 100 cents
1935–1965: 1 British West Indies dollar = 100 cents

49.2 Units of Length

After 1891

				Metric
mile				1609.344 m
1760	yard			914.4 mm
5280	3	foot		304.8 mm
63,360	36	12	inch	25.4 mm

49.3 Units of Area

After 1891

				Metric
acre				4046.856 422 m ²
4840	square yard			83.612 736 dm ²
43,560	9	square foot		9.290 304 dm ²
6,272,640	1296	144	square inch	6.451 6 cm ²

49.4 Units of Dry Capacity

Dry commodities were generally sold by weight.

49.5 Units of Liquid Capacity

Before 1891

					Metric
butt					490.694 L
2	hogshead				245.347 L
3	1½	barrel			163.565 L
108	54	36	gallon		4.543 46 L
432	216	144	4	quart	1.135 86 L

1 wine gallon (after 1891) = 1 U.S. liq gal =
3.785 411 784 L.

49.6 Units of Weight

After 1891

					Metric
ton					1016.047 043 kg
20	hundredweight				50.802 352 kg
160	8	stone			6.350 294 kg
2240	112	14	pound		453.592 430 g
35,840	1792	224	16	ounce	28.349 527 g

50 Bassas da India

This is an uninhabited atoll, located in the south-
ern Mozambique Channel.

51 Basutoland

See *Lesotho*.

52 Bechuanaland

See *Botswana*.

53 Belarus [Formerly:
Byelorussian Soviet Socialist
Republic]

See also *Russia*.

This area was incorporated in Kievan Russia
as a result of its growth after the 860s. After

1054, it became a Polotsk principality. In 1240,
this was dissolved after the Kievan Russian and
Mongol invasion of what is now Belarus, becom-
ing part of the Grand Duchy of Lithuania in the
1300s, and later Poland-Lithuania. In 1795,
Belarus fell under Tsarist rule from Russia.
After the Russian Revolution in 1917, Belarus
was independent for a short period before it
became part of the Soviet Union as the Byelorus-
sian SSR. Belarus finally became truly indepen-
dent in 1991.

53.1 Currency

2000–: 1 Belarus ruble = 100 kapyeykas
1994–2000: 1 new Belarus ruble =
100 kapyeykas
1992–1994: 1 Belarus ruble = 100 kapyeykas
1922–1992: 1 Russian ruble = 100 kopeks

53.2 Units of Length

1 djuim = 1 in = 25.4 mm.

53.3 Units of Weight

1 pound = about 16.380 kg.

54 Belgian Congo

See *Congo*.
The Belgian Congo and Ruanda-Urundi were united administratively from 1925 until 1960, when Ruanda-Urundi became the Republic of Rwanda and Belgian Congo became Congo.

55 Belgium

See also *Duchy of Bouillon* and *the Netherlands*.
Belgium was, in the Middle Ages, along with present-day Netherlands, part of the Holy Roman Empire. Modern Belgium was later divided into several small states: the counties of Flanders, Hainaut, Limburg and Namur, the Duchy of Brabant, and the Prince-Bishopric of Liège. These feudal states were united under the Duchy of Burgundy, from which they passed to the House of Habsburg in 1477. The United Belgian States were established in 1790, but were annexed by France in 1795. According to the Treaty of Campo Formio, in 1797, they were transferred from Austria to France. Placed under Dutch rule in 1815 by the Treaty of Paris, Belgium rose up against the Netherlands in 1830 and became independent in 1831, when Leopold of Saxe-Coburg-Saalfeld was chosen as King of the Belgians.

The older systems of weights and measures were derived from the Dutch and German systems. The metric system has been official since August 21, 1816, and compulsory by law since January 1, 1820, but as it was never vigorously enforced, the change in weights and measures was gradual. As several of the old names for various units were kept, even after given metric-linked values, Belgium needed a restart. On October 1, 1855, a more rigorous law established the exclusive use of the French metric system, with the French names of the units coming into full use after January 1, 1856.
Main sources: [BAUE], [DOUR], [FORI2], [STAR], and [UN55]

55.1 Currency

- 1999–: 1 euro = 100 euro-cents
- 1945–2002: 1 Belgian franc = 100 centimes
1 Luxembourgish franc = 100 centimes
- 1926–1945: 1 Belgian belga = 5 francs = 500 centimes
- 1830–1925: 1 Belgian franc = 100 centimes
- 1815–1830: 1 Dutch guilder = 20 stivers = 320 pennings
- 1789–1814: 1 franc = 100 centimes or cents
- 1612–?: 1 Souverin d’Or = 5/3 Couronne
‘Or = 153 sols
- Sixteenth century: 1 gold real = 60 sols
1 Krolus florin = 40 sols
1 silver Karolus = 20 sols

55.2 Units of Length

Brabanter system

				Metric
mille de Brabant				6277.240 m
9032	aune de Brabant ^a			695.0 mm
21, 676⅕	2⅔	pied de Brabant		289.583 mm
144,512	16	6⅔	taille	43.437 mm

^aAccording to [DOUR], = 695.642 mm, but usually taken in commerce as 700 mm. [KENN, p. 56] reported that, in practice, the aune became 2/3 meter during the nineteenth century

Until the mid-eighteenth century

				Metric
perche				5.736 m
20	pied			286.800 mm
220	11	pouce		26.073 mm
2420	121	11	ligne	2.370 mm

Other reported measures during the eighteenth century:

1 **post-mille** = 7807.165 7 m;

1 **aune à soie** or **Antwerpsche el** (for silk) = 694.1 mm;

1 **aune** (in Mechelen) = 688.54 mm;

1 **aune à laine** or **Antwerpsche el** (for wool) = 684.4 mm;

1 **Antwerpsche voet** = 286.8 mm.

During the late eighteenth century and early nineteenth century

					Metric	Metric
mille					1949 m	2015 m
300	perche or verge				6.497 m	6.717 m
1000	3 $\frac{1}{3}$	toise			1.949 m	2.015 m
6000	20	6	pied		324.85 mm	335.8 mm
60,000	200	60	10	pouce	32.485 mm	33.58 mm

Metric-linked system before 1816

			Metric
aune			1.20 m
4	pied		300 mm
40	10	pouce	30 mm

Metric-linked system after 1816

						Metric
millimétrique or mijl						1000 m
100	perche or roed					10 m
1000	10	aune or el				1 m
10,000	100	10	palme			100 mm
100,000	1000	100	10	pouce or duim		10 mm
1,000,000	10,000	1000	100	10	ligne or streep	1 mm

Before 1855

1 **mille marin** = 1/3 lieue marin = 1 852.2 m.

After 1855

1 **mille marin** = 1 international nautical mile = 1,852 m;

1 **post-mille** = 2000 m.

Metric scale after 1856

								Metric
myriamètre								10,000 m
10	kilomètre							1000 m
100	10	hectomètre						100 m
1000	100	10	décamètre					10 m
10,000	1000	100	10	mètre				1 m
100,000	10,000	1000	100	10	décimètre			100 mm
1,000,000	100,000	10,000	1000	100	10	centomètre		10 mm
10,000,000	1000,000	100,000	10,000	1000	100	10	millimètre	1 mm

55.3 Units of Area

Brabanter system

				Metric
perche carrée				32,875,889 m ²
$8\frac{1}{4} \times 8\frac{1}{4}$	Brabanter elle carrée			48,302 5 dm ²
$392\frac{7}{50}$	$2\frac{2}{5} \times 2\frac{2}{5}$	pied carrée		8,385 850 5 dm ²

During the late eighteenth century and early nineteenth century

		Metric	Metric
arpent		$\sim 13,060 \text{ m}^2$	18,047.236 m ²
400	verge carrée	$\sim 32.65 \text{ m}^2$	45.118 m ²

Until the late eighteenth century

				Metric
bonnier				13,160.678 4 m ²
400	perche carrée			32,901 696 m ²
160,000	400	pied carrée		8,225 424 dm ²
19,360,000	48,400	121	pouce carrée	6,797 87 cm ²

Metric-linked system after 1816

				Metric
bonnier				10,000 m ²
100	perche carrée			100 m ²
10,000	100	aune carrée		1 m ²

Metric scale after 1856

							Metric
hectare							10,000 m ²
100	are						100 m ²
10,000	100	mètre carré or centiare					1 m ²
1,000,000	10,000	100	décimètre				10,000 mm ²
100,000,000	1,000,000	10,000	100	centimètre			100 mm ²
10,000,000,000	100,000,000	1,000,000	10,000	100	millimètre		1 mm ²

55.4 Units of Volume

Some measures reported during the nineteenth century:

1 **tonneau de mer** (before 1820) = 100 cu ft =
about 2.83 m³;

1 **corde** (for timber, after 1820) = 1 m³.

Metric system after 1856

						Metric
décastère						10 m ³
10	stère					1 m ³
100	10	décistère				100 dm ³
10,000	1000	100	décimètre cube			1 dm ³
10,000,000	1,000,000	100,000	1000	centimètre cube		1 cm ³
10,000,000,000	1,000,000,000	100,000,000	1,000,000	1000	millimètre cube	1 mm ³

55.5 Units of Dry Capacity

For cereals, except oats, until the early nineteenth century; theoretical and as used in retail

						Metric	Metric
last						2887.5 L	2,800 L
37½	rasière					77.0 L	74.667 L
150	4	meuken				19.25 L	18.667 L
2100	56	14	pot			1.375 L	1.333 L
4200	112	28	2	pint		687.5 mL	666.7 mL
8400	224	56	4	2	uper	343.75 mL	333.3 mL

For oats and charcoal until the early nineteenth century

						Metric
last						3609.375 L
37½	rasière					96.25 L
150	4	meuken				24.062 5 L
2625	70	17½	pot			1.375 L
5250	140	35	2	pint		687.5 mL
10,500	280	70	4	2	uper	343.75 mL

Metric-linked system after 1816

		Metric
boisseau		15 L
10	pot	1.5 L

Metric-linked system after 1820

						Metric
last						3000 L
30	baril, rassièr, or sac					100 L
300	10	boisseau				10 L
3000	100	10	litron			1 L
30,000	1000	100	10	mesurette or verre		100 mL
300,000	10,000	1000	100	10	de	10 mL

Other reported measures:

1 **dé** (used between 1816 and 1836) = 100 mL.

55.6 Units of Liquid Capacity

For wine, olive oil, and spiritus

					Metric
aam or aïme					137.4 L
50	stoop				2.748 L
100	2	pot			1.374 L
200	4	2	pinte		687.0 mL
400	16	4	2	uper	343.5 mL

For oil, theoretical and sometimes reported as used in retail

				Metric	Metric
aam or aïme				138.009 12 L	–
4	seau			34.502 28 L	–
24	6	schrève		5.750 38 L	5.555 L
96	24	4	pot	1.437 595 L	1.389 L

Metric system after 1856

						Metric
hectolitre						100 L
10	décalitre					10 L
100	10	litre				1 L
1000	100	10	décilitre			100 mL
10,000	1000	100	10	centilitre		10 mL
100,000	10,000	1000	100	10	millilitre	1 mL

For beer

		Metric
vat		160 L
120	pot	1.333 333 L

Metric-linked system, 1816

		Metric
Litron		10 L
10	pot	1 L

Metric-linked system after 1820

				Metric
baril				100 L
100	litron			1 L
1000	10	verre		100 mL
10,000	100	10	dé	10 mL

55.7 Units of Weight

Traditional system

									Metric
quintal									46.770 kg
100	livre								467.70 g
200	2	marc							233.85 g
400	4	2	quarteron						116.92 g
1600	16	8	4	once					29.23 g
3200	32	16	8	2	lot				14.61 g
6400	64	32	16	4	2	satin			7.31 g
12,800	128	64	32	8	4	2	gros		3.65 g
921,600	9216	4608	2304	576	288	144	72	grain	50.75 mg

For salt until the early nineteenth century

		Metric
tonneau		~170 kg
6	rasière	~28.3 kg

Upper scale, as reported during the late eighteenth century, early nineteenth century, and mid-nineteenth century

							Metric	Metric	Metric
charge							188.062 02 kg	188.062 44 kg	195.80 kg
1 $\frac{1}{3}$	schippoud						–	141.046 83 kg	146.85 kg
2	1 $\frac{1}{2}$	balle					94.031 01 kg	94.031 22 kg	97.90 kg
2 $\frac{1}{3}$	1 $\frac{1}{4}$	1 $\frac{1}{33}$	chariot				–	–	80.767 5 kg
4	3	2	1 $\frac{1}{20}$	quintau			47.015 5 kg	47.015 61 kg	48.950 kg
50	37 $\frac{1}{2}$	25	20 $\frac{1}{8}$	12 $\frac{1}{2}$	pierre		–	3.761 249 kg	3.916 kg
400	300	200	165	100	8	livre	470.155 g	470.156 1 g	489.5 g

Lower scale during the early and mid-nineteenth century

							Metric	Metric
livre							470.156 1 g	489.5 g
2	marc						235.078 05 g	244.75 g
16	8	once					29.384 76 g	30.593 75 g
32	16	2	demi-ounce or lood				14.692 38 g	15.296 87 g
256	128	16	8		main		1.836 55 g	1.912 11 g

Metric-linked system after 1816

							Metric
last							1000 kg
2	tonneau						500 kg
10	5	quintal					100 kg
1000	500	100	livre				1 kg
10,000	5000	1000	10	once			100 g
100,000	50,000	10,000	100	10	lood		10 g
1,000,000	500,000	100,000	1000	100	10	wigtje	1 g

Metric-linked system after 1820

								Metric
last		tonneau						1000 kg
2								500 kg
10		quintal						100 kg
1000		500	livre					1 kg
10,000		5000	10	once				100 g
100,000		50,000	100	10				10 g
1,000,000		500,000	1000	100			esterlin	1 g
10,000,000		5,000,000	10,000	1000	100	10	grain	100 mg

Metric system after 1856

								Metric
tonneau								1000 kg
10	quintal							100 kg
1000	100	kilogramme						1 kg
10,000	1000	10	hectogramme					100 g
100,000	10,000	100	10	déca-gramme				10 g
1,000,000	100,000	1000	100	10	gramme			1 g
10,000,000	1,000,000	10,000	1000	100	10	décigramme		100 mg
100,000,000	10,000,000	100,000	10,000	1000	100	10	centigramme	10 mg
1,000,000,000	100,000,000	1,000,000	100,000	10,000	1000	100	milligramme	1 mg

For gold and silver before 1816 and after 1816

								Metric	Metric
pond trooisch								492.167 72 g	492.152 g
2	mark							246.083 86 g	246.076 g
4	2	ons						123.041 93 g	123.038 g
32	16	8	esterling					15.380 24 g	15.379 75 g
640	320	160	20	vierling				769.012 mg	768.987 mg
2560	1280	640	80	4	troisk			192.253 mg	192.247 mg
5120	2560	1280	160	8	2	deusk		96.126 mg	96.123 mg
10,240	5120	2560	320	16	4	2	as	48.063 mg	48.062 mg

For medical use before 1820 and after 1820

					Metric	Metric
livre médicale					275.347 g	375 g
12	once médicale				22.945 58 g	31.25 g
96	8	drachme			2.868 20 g	3.906 g
288	24	3	scrupule		956.1 mg	1.302 g
5760	480	60	20	grain médicale	47.8 mg	65.1 mg

55.8 Antwerp

55.8.1 Units of Length

1 **elle** (for some import textiles at Antwerp) = 695.86 mm;

1 **aune** (at Weelde and Zandvliet) = 695.4 mm.

1 **elle** (for silk at Antwerp) = 693.90 mm;

1 **elle** (for wool at Antwerp) = 684.6 mm;

1 **aune** (at Lier) = 689.0 mm;

1 **aune** (at Mariekerke) = 695.6 mm;

1 **aune** (at Mol) = 16 tailles = 686.4 mm;

1 **aune** (at Poppel) = 695.0 mm;

1 **aune** (at Ravels) = 695.0 mm;

1 **aune** (at Retie) = 695.6 mm;

1 **aune** (at Santhoven) = 695.6 mm;

1 **aune** (at Zandvliet) = 695.0 mm;

1 **aune** (at Turnhout) = 695.0 mm;

1 **aune** (at Weelde) = 695.0 mm;

1 **aune** (at Westerlo) = 16 tailles = 686.4 mm;

1 **aune** (at Wilryck) = 695.0 mm.

At Antwerp, Brecht, Haasdonk, Hingene, Hoogstraaten, Kontich, and Poppel; at Heist-op-den-berg; at Herentals and Westerlo; and at Retie

		Metric	Metric	Metric	Metric
aune		695.7 mm	689.4 mm	686.4 mm	695.6 mm
16	taille	43.481 25 mm	43.087 5 mm	42.900 mm	43.475 mm

At Antwerp, Arendonck, Dessel, Ravels, Retie, Turnhout, and Wilryck; at Duffel and Heist-op-den-berg; at Herentals and Westerlo

					Metric	Metric	Metric
lieue^a					5736 m	5560 m	5748 m
1000	verge				5.736 m	5.560 m	5.748 m
20,000	20	pied			286.8 mm	278 mm	287.4 mm
220,000	220	11	pouce		26.072 7 mm	25.272 7 mm	26.127 3 mm
2,420,000	2,420	121	11	ligne	2.370 2 mm	2.297 5 mm	2.375 2 mm

^a1 **lieue 15 degrés** (at Antwerp) = 7408.0 m

At Bornem and Hingene

		Metric
verge		3.854 2 m
14	pied	275.3 mm

At Santhoven and Zandvliet

		Metric
verge		3.824 m
13 $\frac{1}{3}$	pied	286.8 mm

55.8.2 Units of Area

At Antwerp, Arendonk, Brecht, Dessel, Kontich, Liere, Poppel, Ravels, Retie, Santhoven, Turnhout, Weelde, and Wilryck

					Metric
bonnier					13,160.678 256 m ²
4	journal				3290.169 564 m ²
400	100	verge carrée			32.901 696 m ²
160,000	40,000	400	pied carrée		8.225 424 dm ²
19,360,000	4,840,000	48,400	121	pouce carrée	6.797 871 cm ²

At Braine-le-Comte

					Metric
bonnier					10,909.886 m ²
4	journal				2 727.471 5 m ²
400	100	verge carrée			27.274 715 m ²
126,736	31,684	316 $\frac{2}{25}$	pied carrée		8.608 35 dm ²

At Duffel, Heist-op-den-berg, and Mechelen; at Geel, Herentals, Mol, and Westerlo

					Metric	Metric
bonnier					12,365.44 m ²	13,215.801 6 m ²
4	journal				3091.36 m ²	3303.950 4 m ²
400	100	verge carrée			30.913 6 m ²	33.039 504 m ²
160,000	40,000	400	pied carrée		7.728 4 dm ²	8.259 876 dm ²
16,000,000	4,000,000	40,000	100	pouce carrée	7.728 4 cm ²	8.259 876 cm ²

At Duffel (alternative scale)

					Metric
bonnier					10,580.18 m ²
4	journal				2645.045 m ²
400	100	verge carrée			26.450 45 m ²
136,900	34,225	342 $\frac{1}{4}$	pied carrée		7.728 4 dm ²
13,690,000	3,422,500	34,225	100	pouce carrée	7.728 4 cm ²

Old scale at Bornem and Hingene

				Metric
bonnier				11,883.886 112 m ²
4	journal			2970.971 528 m ²
800	200	verge carrée		14.854 858 m ²
156,800	39,200	196	pied carrée	7.579 009 dm ²

New scale at Bornem

				Metric
bonnier				13,369.371 876 m ²
3	arpent			4456.457 292 m ²
900	300	verge carrée		14.854 857 64 m ²
176,400	58,800	196	pied carrée	7.579 009 dm ²

At Hoogstraten

				Metric
bonnier				8422.83 m ²
4	journal			2105.707 m ²
400	100	verge carrée		21.057 07 m ²
102,400	25,600	256	pied carrée	8.225 42 dm ²

At Turnhout

				Metric
bonnier				13,160.678 m ²
4	journal			3290.169 m ²
400	100	verge carrée		32.901 69 m ²
160,000	40,000	400	pied carrée	8.225 42 dm ²

At Zandvliet

				Metric
bonnier				13,160.678 m ²
3	arpent			4386.893 m ²
900	300	verge carrée		14.622 976 m ²
160,000	53,333⅓	177⅔	pied carrée	8.225 424 dm ²

55.8.3 Units of Volume

At Antwerp

			Metric
pied cube			23.590 516 032 dm ³
1,331	pouce cube		17.723 903 855 748 cm ³
1,771,561	1,331	ligne cube	13.316 231 297 mm ³

For timber:

1 **cord** or **wis** (at Antwerp; 3 pieds × 3 pieds × 3 pieds) = 636.943 9 dm³.

55.8.4 Units of Dry Capacity

1 **last** (for sugar at Antwerp) = 2,000 kg;

1 **raisière** (for crude sea salt at Antwerp) = 170 kg.

1 **panier** (for herrings at Antwerp) = 200 herrings.

For cereals at Antwerp, Dessel, Geel, Herenthals, Hoogstraten, Kontich, Retie, Santhoven, Wilryck and Zandvliet

						Metric
last						2887.5 L
18¾	sac^a					154.0 L
37½	2	viertel or razière				77.0 L
150	8	4	meuk or meuke^b			19.25 L
2100	112	56	14	pot		1.375 L
4200	224	112	28	2	pinte or demi-pot	687.5 mL
8400	448	224	56	4	2	uper 343.75 mL

^aFor wheat, usually said to equal 122.25 kg

^bFor oats and coal, 1 meuke = 17½ pots = 24.062 5 L

For oats and charcoal at Antwerp, Dessel, Geel, Herenthals, Hoogstraten, Kontich, Retie, Santhoven, Wilryck, and Zandvliet

				Metric
meuk or meuke				24.062 5 L
17½	pot			1.375 L
35	2	pinte		687.5 mL
70	4	2	uper	343.75 mL

For hydrated lime at Antwerp

			Metric
sac			136.0 L
4	mesure		34.0 L

For cereals at Sant-Amand, Boom, Bornem, Duffel, Haasdonk, Heist-up-den-berg, Hingene, Liezele, Lippelo, Mariekerke, Mol, Mechelen, Opuers, Puurs, Reet, Weerdt and Westerlo

				Metric
viertel				86.5 L
4	meuke			21.625 L
63	15¾	pot		1.373 L
126	31½	2	pinte	686.5 mL

For oats, lime, charcoal and earth at Sant-Amand, Boom, Bornem, Duffel, Haasdonk, Heist-up-den-berg, Hingene, Liezele, Lippelo, Mariekerke, Mechelen, Mol, Opuers, Puurs, Reet, Weerdt and Westerlo

				Metric
meuke				25.40 L
18½	pot			1.373 L
37	2	pinte		686.5 mL

For various grits and flour at Saint Amand, Bornem, Duffel, Haasdonk, Heist-up-den-berg, Hingene, Liezele, Lippelo, Mariekerke, Mechelen, Oppuers, Puurs, and Weerdt

		Metric
measure		7.04 L
10¼	pinte	686.83 mL

At Lier

				Metric
measure^a				147.68 L
–	measure^b			51.83 L
–	–	measure^c		17.75 L
104	36½	12½	pot	1.42 L

^aFor small embers

^bFor coal

^cFor ashes

Metric linked system at Antwerp

			Metric
last			3 000 L
37½	viertel		80 L

55.8.5 Units of Liquid Capacity

For general use at Antwerp, Herenthals, Hoogstraten, Kontich, Retie, Santhoven, Wilryck, and Zandvliet

									Metric
boot									417.70 L
3 ⁸ / ₁₇₅	tonne								164.88 L
3 ¹ / ₂₅	1½	aime or aam							137.40 L
12 ² / ₃	5	4⅙	seau or emmer						32.976 L
76	30	25	6	schreve					5.496 L
152	60	50	12	2	stoop				2.748 L
304	120	100	24	4	2	pot			1.374 L
608	240	200	48	8	4	2	pinte		687 mL
2432	480	800	192	32	16	4	2	uper	343.5 mL

Other measures reported during the eighteenth–nineteenth centuries:

- 1 **tun** (for beer) = 54 stoops = 148.39 L;
- 1 **velt** (for some wines) = 18.66 L.

For oil from flax, hemp, rape seed, etc., at Antwerp, Herenthals, Hoogstraten, Kontich, Retie, Santhoven, Wilryck, and Zandvliet

				Metric
aime or aam				133.330 L
4	seau or eimer			33.332 5 L
24	6	schrève or schreef		5.555 417 L
96	24	4	pot	1.388 854 L

At Bornem, Duffel, Haasdonk, Heist-up-den-berg, Hingene, Lippelo and Westerlo

			Metric
pot			1.373 L
2	pinte or demi-pot		686.5 mL
4	2	uper	343.25 mL

At Antwerp, based on [MART3]

									Metric
charge									188.062 440 kg
1⅓	schippond								141.046 830 kg
	1⅞ ₁₁	chariot							67.575 757 kg
4	3	1 ¹³ / ₂₀	quintal						47.015 610 kg
50	37½		12½	pierre					3.761 249 kg
400	300	165	100	8	livre				470.156 g
6400	4800	2640	1600	128	16	once			29.385 g
12,800	9600	5280	3200	256	32	2	loth		14.692 g
102,400	76,800	42,240	25,600	2048	256	16	8	main or seizième	1.836 g

For beer at Antwerp

		Metric
tonne		160 L
120	pot de bière	1.333 333 L

55.8.6 Units of Weight

- 1 **mond** or **mont** (for plaster at Antwerp) = 1,250 kg;
- 1 **livre** (at Mariekerke) = 469.25 g.

At Antwerp, Arendonk, Brecht, Dessel, Geel, Hingene, Hoogstrate, Kontich, Lier, Poppel, Ravels, Retie, Santhoven, Turnhout, Weelde, Westerlo, Wilryck, and Zandvliet

				Metric
charge				188.069 kg
400	livre			470.173 g
6400	16	once		29.386 g
102,400	256	16	main or seizième	1.837 g

At Boom, Bornem, Duffel, Heist-op-den-berg, Mechelen, Mariekerke, Puurs, Reet, and Rumst

				Metric
livre				469.25 g
16	once			29.328 g
320	20	engel		1.466 g
10,240	640	32	grain	45.8 mg

At Liezele, Lippelo, and Oppuers

			Metric
livre			467.7 g
16	once		29.231 g

For gold and silver at Antwerp and Mechelen

					Metric
marc					246.10 g
8	once				30.762 5 g
160	20	esterlin			1.538 1 g
640	80	4	félin		384.53 mg
5120	640	32	8	as	48.066 mg

For gold and silver at Turnhout

				Metric
livre				492.2 g
16	once			30.762 g
320	20	esterling		1.538 g
10,240	640	32	as	48.1 mg

For medical use at Antwerp

					Metric
livre					275.347 g
12	once				22.945 6 g
96	8	drachme			2.868 2 g
288	24	3	scrupule		956.1 mg
5760	480	60	20	grain	47.8 mg

55.9 Brussels

55.9.1 Units of Length

Before 1816

				Metric
perche				5.515 005 78 m
20	pied			275.750 289 mm
220	11	pouce		25.068 208 mm
1760	88	8	ligne	3.133 526 mm

For cloth during the eighteenth–nineteenth centuries:

1 **aune de Brabant** = 695.60 mm;

1 **Brusselsch el** (for wool) = 684.89 mm;

1 **Brusselsch el** = 587 mm.

Other measures used before 1816:

1 **lieue de Flandre** = 6278.930 m;

1 **lieue de Brabant** = 5556.000 m.

55.9.2 Units of Area

Old scale

				Metric
gemet				9870.508 8 m ²
300	perche carrée			32.901 696 m ²
120,000	400	pied carrée		8.225 424 dm ²
14,520,000	48,400	121	pouce carrée	6.797 87 cm ²

Before 1816

		Metric
perche carrée		30.415 289 m ²
400	pied carrée	7.603 822 dm ²

Other reported measures during the nineteenth century:

1 **bonnier** = 8114.060 m².

55.9.3 Units of Volume

Some measures reported during the nineteenth century:

1 **corde** (for firewood after 1816) = 1 m³;

1 **pied cube** (before 1816) = 20.967 m³.

55.9.4 Units of Dry Capacity

For cereals, except oats

						Metric
rasière						48.758 4 L
2	holster					24.379 2 L
4	2	quartier				12.189 6 L
16	8	4	picotin			3.047 4 L
20	10	5	1¼	mole-vat or Molstervat		2.437 9 L
72	36	18	4½	3⅔	pot wallon	677.20 mL

For oats

						Metric
boisseau						63.656 8 L
–	rasière					51.467 2 L
–	16	picotin				3.216 7 L
23½	19	1⅔ ₁₆	loot or Gelte			2.708 8 L
–	64	4	3⅔ ₁₉	pot wallon		677.20 mL

For salt

				Metric
boisseau				56.884 8 L
2⅓	rasière			24.379 2 L
21	9	loot or Gelte		2.708 8 L
–	–	3⅔ ₁₉	pot wallon	677.20 mL

For grain at Leuven

					Metric
mud or muid					240 L
8	boisseau or halster				30 L
16	2	mole-vat			15 L
32	4	2	viertel or quartier		7.5 L

55.9.5 Units of Liquid Capacity

For beer

						Metric
aime						130.022 4 L
50	stoop					2.600 448 L
100	2	pot				1.300 224 L
200	4	2	pinte			650.112 mL
1600	32	16	8	glas or verre		81.364 mL

For wine

									Metric
foudre									780.134 4 L
6	aime								130.022 4 L
144	24	schreef or marque							5.417 60 L
288	48	2	gelte or loot						2.708 80 L
576	96	4	2	pot					1.354 40 L
864	144	6	3	1½	gemet				902.93 mL
1152	192	8	4	2	1⅓	pinte or pot wallon			677.20 mL
2304	384	16	8	4	2⅔	2	demi-pinte or uperkens		338.60 mL
36,864	6144	256	128	64	42⅔	32	16	oncia	21.16 mL

For honey, syrup, oil and milk

		Metric
gemet		902.933 mL
3	verre	300.978 mL

Other measures reported in Brussels:

1 **aime** (for linseed oil) = 127 L or 122 kg;1 **aime** (for rapeseed oil) = 131 L or about 120 kg.

55.9.6 Units of Weight

For commercial use

				Metric
livre or Brusselsch pond				467.670 0 g
16	once			29.229 4 g
128	8	gros		3.653 7 g
9216	576	72	grain	50.74 mg

For wholesale trade

						Metric
livre pesante or Brusselsch poids de marc						492.151 8 g
2	marc					246.075 9 g
16	8	once				30.759 5 g
320	160	20	esterlin			1.538 0 g
1280	640	80	4	félin		384.49 mg
10,240	5120	640	32	8	as	48.06 mg

For gold and silver

					Metric
marc					246.10 g
8	once				30.762 5 g
160	20	esterlin			1.538 1 g
640	80	4	félin		384.53 mg
5120	640	32	8	As	48.066 mg

55.10 East Flanders

55.10.1 Units of Length

- 1 **aune** (for raw canvas at Ghent) = 765.00 mm;
1 **aune** (in malls at Dendermonde) = 731.0 mm;
1 **aune** (for white canvas at Ghent) = 728.00 mm;
1 **aune** (for commercial use at Ghent) = 698.00 mm;
1 **aune** (in shops at Dendermonde) = 696.0 mm;
1 **aune** (at Haesdonck) = 695.6 mm;
1 **aune** (for retail at Oudenaarde) = 703.0 mm;
1 **aune** (for wholesale at Oudenaarde) = 734.0 mm;
1 **aune** (for unbleached fabrics at Oudenaarde) = 768.0 mm;
1 **pied de construction** (at Ghent) = 297.770 mm;
1 **pied** (at Ghent) = 275.286 mm.

At Aalst and Geraardsbergen; at Oudenaarde

		Metric	Metric
perche or verge		5.544 m	5.702 m
20	pied	277.2 mm	285.1 mm

At Dendermonde

		Metric
verge		5.796 m
21	pied	276.0 mm

55.10.2 Units of Area

At Aalst and Geraardsbergen; at Oudenaarde

		Metric	Metric
arpent		4098.125 m ²	–
133⅓	perche carrée or verge carrée	30.735 936 m ²	32.512 804 m ²
53, 333⅓	400	pied carrée	7.683 984 dm ²
			8.128 201 dm ²

At Dendermonde

		Metric
verge carrée		35.593 616 m ²
441	pied carrée	8.071 115 dm ²

At Ghent

				Metric
bonnier ^a				11,883.90 m ²
3	arpent			3961.30 m ²
800	266⅔	verge carrée		14.854 88 m ²
156,800	52, 266⅔	196	pied carrée	7.579 02 dm ²

^aAlso reported as 12 138.720 m²

55.10.3 Units of Dry Capacity

1 **halster** (at Ghent) = 52.070 500 L.

55.10.4 Units of Liquid Capacity

1 **pinte** (at Ghent) = 576.00 mL.

55.10.5 Units of Weight

At Haasdonk; at Oudenaarde; and at Ronse

		Metric	Metric	Metric
livre		470.2 g	441.9 g	442.0 g
16	once	29.387 g	27.619 g	27.625 g

At Ghent

				Metric
pierre				2.603 037 kg
6	livre			433.840 g
96	16	once		27.115 g
384	64	4	saisin	6.779 g

55.11 Flemish Brabant

55.11.1 Units of Length

Traditional system in Diest and Tienen

		Metric
verge		5.710 m
20	pied	285.5 mm

1 **aune** (at Teralphene) = 16 *tailles* = 730.0 mm;1 **aune** (at Tienen) = 16 *tailles* = 680.0 mm;

55.11.2 Units of Area

Traditional system in Diest and Tienen

		Metric
verge carrée		32.604 10 m ²
400	pied carrée	8.151 025 dm ²

55.11.3 Units of Dry Capacity

1 **mesure** (for lime at Leuven) = 199.48 L;1 **mesure** (for ashes at Leuven) = 50.89 L;1 **mesure** (for oats at Leuven) = 35 L;1 **mesure** (for horse beans, peas and strawberries) = 3.5 L;1 **mesure** (for salt at Tienen) = 1.91 L.

At Overysseche

		Metric
muid		195.03 L
6	rasière	32.505 L

55.11.4 Units of Liquid Capacity

1 **oncia** (at Leuven) = 28.22 mL.

For milk at Leuven

		Metric
mesure		550 mL
26	once	21.15 mL

55.11.5 Units of Weight

At Diest; at Overysseche; and at Teralphene

		Metric	Metric	Metric
livre		464.0 g	467.7 g	409.2 g
16	once	29.0 g	29.231 g	25.575 g

55.12 Hainaut

55.12.1 Units of Length

At Saint Amand

		Metric
verge		3.854 2 m
14	pied	275.3 mm

At Binche

		Metric
verge		4.547 7 m
15½	pied	293.4 mm

At Châtelet

		Metric
verge		4.595 85 m
15¾	pied	291.8 mm

At Charleroi, Fleurus and Gosselies

		Metric
verge		4.814 7 m
16½	pied	291.8 mm

At Ath

		Metric
verge		5.721 3 m
19½	pied	293.4 mm

At Peruwelz

		Metric
verge		5.868 m
20	pied	293.4 mm

At Chimay

		Metric
verge		6.419 6 m
22	pied	291.8 mm

Some other reported measures:

- 1 **verge** (at Lessines) = 5.603 94 m;
 1 **verge** (at Boussu, Jemappes, Mons and Quiévrain) = 5.413 23 m;
 1 **verge** (at Braine-le-Comte) = 5.222 52 m;
 1 **aune** (at Mons) = 734.240 mm.
 1 **aune** (at Fontaine-l'Évêque) = 743.2 mm;
 1 **grande aune** (at Gosselies) = 698.2 mm;
 1 **pas** (at Warneton) = 2½ pieds = 684.75 mm;

Traditional system in Charleroi, Fleurus and Gosselies

					Metric
bonnier					9272.534 4 m ²
3	journal				3090.844 8 m ²
12	4	quarteron			772.711 20 m ²
400	133⅓	33⅓	verge carrée		23.181 336 m ²
108,900	36,300	9075	272¼	pied carrée	8.514 724 dm ²

- 1 **petite aune** (at Gosselies) = 674.2 mm;
 1 **aune** (at Jumetz) = 16 tailles = 695.6 mm;
 1 **aune** (at Thuin) = 743.2 mm;
 1 **aune** (at Tournai) = 738.2 mm

55.12.2 Units of Area

Traditional system in Saint Amand

		Metric
verge carrée		14.854 858 m ²
196	pied carrée	7.579 009 dm ²

Traditional system in Binche

		Metric
verge carrée		20.681 575 m ²
240¼	pied carrée	8.608 356 dm ²

Traditional system in Châtelet

		Metric
verge carrée		21.121 837 m ²
248⅙	pied carrée	8.514 724 dm ²

Traditional system in Ath

		Metric
verge carrée		32.733 274 m ²
380¼	pied carrée	8.608 356 dm ²

Traditional system in Peruwelz

		Metric
verge carrée		34.433 424 m ²
400	pied carrée	8.608 356 dm ²

Traditional system in Chimay

		Metric
verge carrée		41.211 264 m ²
484	pied carrée	8.514 724 dm ²

Some other reported measures:

- 1 **bonnier** (at Mons) = 7582.00 m²;
1 **verge carrée** (at Lessines) = 31.404 144 m²;
1 **verge carrée** (at Boussu, Jemappes, Mons and Quiévrain) = 29.303 059 m²;
1 **verge carrée** (at Braine-le-Comte) = 27.274 715 m².

55.12.3 Units of Volume

- 1 **corde** (for firewood at Ath) = $4\frac{1}{3} \times 4\frac{1}{3} \times 4$ pieds = $74\frac{2}{3}$ pieds cubes = 1.874 624 m³.

55.12.4 Units of Dry Capacity

- 1 **panier** (for charcoal at Mons) = 94.5 L.

55.12.6 Units of Weight

At Ath, Brain-le-Comte and Péruwelz

			Metric
livre			469.0 g
16	once		29.312 g
10,240	640	grain	45.8 mg

At Binche, Boussu, Jemappes, Mons, and Quiévrain

				Metric
livre				465.542 g
16	once			29.096 g
512	32	trente-deuxième partie		909.26 mg
10,240	640	20	grain	45.46 mg

At Charleroi and Chimay

				Metric	Metric
livre				467.1 g	458.9 g
16	once			29.193 g	28.681 g
128	8	gros		3.649 g	3.585 g
9216	576	72	grain	50.7 mg	49.8 mg

At Enghien; at Lessines; at Fleurus; at Fontaine-l'Évêque; and at Tournai

			Metric	Metric	Metric	Metric	Metric
livre			469.0 g	467.15 g	467.7 g	466.6 g	430.6 g
16	once		29.312 g	29.197 g	29.231 g	29.162 g	26.912 g
10,240	640	grain	45.8 mg	45.6 mg	45.7 mg	45.6 mg	42.0 mg

For gold and silver at Mons

						Metric
livre						491.762 g
2	marc					245.881 g
16	8	once				30.735 g
320	160	20	esterlin			1.537 g
1280	640	80	4	félin		384.2 mg
10,240	5120	640	32	8	as	48.0 mg

55.12.5 Units of Liquid Capacity

- 1 **pinte** (at Ath) = 1.124 5 L (for beer), and 1.058 27 L (for wine).

For medical use at Mons

		Metric
marc		279.466 g
12	once	23.289 g

55.13 Liège

55.13.1 Currency

1 écu = 4 florins = 80 sous or patards = 320 liards

55.13.2 Units of Length

Old scale

			Metric
pouce			29.469 mm
11	ligne		2.679 mm

At Huy

			Metric
verge^a			4.863 267 m
1 1/24	verge		4.668 736 m
16 2/3	16	pied	291.796 mm

^aFor timber

For carpententers and masons at Saint Lambert

					Metric
verge					18.779 335 m
20	pied de Saint Hubert				938.966 755 mm
200	10	pouce			93.896 675 mm
2000	100	10	ligne		9.389 667 mm
20,000	1000	100	10	point	938.967 µm

For surveying at Saint Lambert

					Metric
verge					4.668 736 m
16	pied de Saint Lambert				291.796 00 mm
160	10	pouce			29.179 60 mm
1600	100	10	ligne		2.917 96 mm
16,000	1000	100	10	point	291.796 µm

At Saint-Hubert

				Metric
pîd				294.698 mm
10	pouce			29.470 mm
100	10	ligne		2.947 mm
1000	100	10	pwint	0.295 mm

Other measures reported during the nineteenth century:

1 **lieue** = 16,000 pied de Saint Hubert = 15,023.468 m;
1 **twaze** (at Liège) = 1.768 2 m;
1 **aune** (at Ruremonde) = 686.0 mm;
1 **ône** (at Liège) = 665 mm;
1 **aune** (at Liège) = 656.246 m.

55.13.3 Units of Area

At Huy

					Metric
Bonnier					8719.077 m ²
4	journal				2179.769 m ²
20	5	verge grande			435.953 86 m ²
400	100	20	verge petite		21.797 693 m ²
102,400	25,600	5120	256	pied carrée	8.514 724 dm ²

^aFor woods

At Saint Lambert

				Metric
bounî				1429.480 m ²
4	djouî			357.370 m ²
20	5	grande vèdje		71.474 m ²
400	100	20	ptite vèdje	3.573 7 m ²

Some other reported measures:

1 **bonî** (at Liège) = 8,718 m²;
1 **grande vèdje** (at Saint Lambert) = 435.89 m²;
1 **vèdje** (at Namur) = 13 m².

55.13.4 Units of Volume

1 **solive** (for timber) = 6 pieds x 1 pied x $\frac{1}{2}$ pied
 = 3 pieds cubes = 7.453 5 dm³.

55.13.5 Units of Dry Capacity

For grain, based on [DOUR], and at Liège, based on [MART3]

						Metric	Metric
muid						245.699 712 L	245.708 274 L
8	siti or setier					30.712 464 L	30.713 534 L
32	4	cwâte or quarte				7.678 116 L	7.678 384 L
192	24	6	pot			1.279 683 L	1.279 731 L
768	96	24	4	pognou		319.921 mL	319.933 mL
3072	384	96	16	4	muzurete or mesurette	79.980 mL	79.983 mL

55.13.6 Units of Liquid Capacity

						Metric
ayme						149.069 657 L
$1\frac{1}{2}$	tonne					99.379 771 L
120	80	pot ^a				1.242 247 L
240	160	2	pint			621.123 mL
480	320	4	2	chopin		310.562 mL
1920	1280	16	8	4	mesurette	77.640 mL

^a50 pouces cubes de Saint Lambert

At Liège, based on [MART3]

						Metric
ayme ^a						172.763 630 L
$1\frac{1}{2}$	tonne					115.175 754 L
135	90	pot				1.279 731 L
270	180	2	pint			639.865 mL
540	360	4	2	chopin		319.933 mL
2160	1 440	16	8	4	mesurette	79.983 mL

^aEqual to 6750 pollici cubi di Saint Hubert = 6,750 × 25.594 611 9 mL = 172.763 630 325 L

55.13.7 Units of Weight

Commercial scale

							Metric
millier							4670.933 kg
100	quintal						46.709 33 kg
10,000	100	livre					467.093 3 g
20,000	200	2	marc				233.546 6 g
160,000	1600	16	8	once			29.193 3 g
1,280,000	12,800	128	64	8	gros		3.649 2 g
3,840,000	38,400	384	192	24	3	denier	1.216 4 g
92,160,000	921,600	9216	4608	576	72	24	grain 50.68 mg

At Liège, based on [MART3]

				Metric
livre				467.093 g
16	once			29.193 g
128	8	gros		3.649 g
9216	576	72	grain	50.7 mg

For medical use

					Metric
livre médical					291.933 3 g
12	once médical				24.327 8 g
96	8	drachme			3.041 0 g
288	24	3	scrupule		1.013 6 g
5760	480	60	20	grain	50.68 mg

For gold and silver

						Metric
livre						492.050 g
2	marc					246.025 g
16	8	once				30.753 125 g
320	160	20	esterlin			1.537 656 g
1280	640	80	4	felin		384.414 mg
10,240	5120	640	32	8	as	48.052 mg

55.14 Limburg**55.14.1 Units of Length**

At Hasselt and Saint Trudo

		Metric
verge		4.668 8 m
16	pied	291.8 mm

At Tongeren

		Metric
verge		4.595 85 m
15¾	pied	291.8 mm

55.14.2 Units of Area

At Hasselt and Saint Trudo

		Metric
verge carrée		21.797 693 m ²
256	pied carrée	8.514 724 dm ²

At Tongeren

		Metric
verge carrée		21.121 837 m ²
248⅙	pied carrée	8.514 724 dm ²

55.14.3 Units of Dry Capacity1 **mudde** (for grain at Tongeren) = 194.38 L.**55.15 Luxembourg****55.15.1 Units of Weight**

At Durbuy, Saint-Hubert; and at Marche-en-Famenne

		Metric	Metric
livre		469.55 g	461.8 g
16	once	29.347 g	28.862 g

55.16 Namur**55.16.1 Units of Length**1 **aune** = 665.108 mm;1 **piede** = 294.763 mm.**55.16.2 Units of Area**1 **piede carré** = 8.688 85 dm².**55.16.3 Units of Volume**1 **pied cube** = 25.611 dm³.**55.16.4 Units of Weight**

At Cincy; at Dinant; at Havelange; and at Orchimont

		Metric	Metric	Metric	Metric
livre		466.65 g	450.1 g	466.573 g	488.5 g
16	once	28.166 g	26.131 g	28.161 g	30.531 g

55.17 Wallon Brabant**55.17.1 Units of Length**

Traditional system at Wavre

		Metric
verge		5.710 m
20	pied	285.5 mm

At Charleroi

		Metric
aune		680.2 mm
16	taille	42.512 mm

1 **aune** (at Nivelles) = 695.6 mm;1 **aune** (at Wavre) = 16 **tailles** = 689.0 mm;

55.17.2 Units of Area

Traditional system at Wavre

		Metric
verge carrée		32.604 10 m ²
400	pied carrée	8.151 025 dm ²

55.17.3 Units of Dry Capacity

For corn, meslin, rye, horse beans, peas, barley, charcoal, oats, and rapeseed at Nivelles

			Metric	Metric
muid			243.84 L	347.53 L
6	rasière		40.64 L	57.92 L
12	2	vasseau or vat	20.32 L	28.96 L

55.17.4 Units of Weight

At Braine-l'Alleud and Nivelles; at Wavres

		Metric	Metric
livre		467.7 g	470.0 g
16	once	29.231 g	29.375 g

At Brugge and at Westkapelle; at Veurne; and at Ypres

				Metric	Metric	Metric
mesure or gemet				4427.367 17 m ²	4547.569 07 m ²	4411.247 15 m ²
3	ligne			1475.789 06 m ²	1515.856 36 m ²	1470.415 72 m ²
300	100	verge carrée		14.757 891 m ²	15.158 564 m ²	14.704 157 m ²
58,800	19,600	196	pied carrée^a	7.529 536 dm ²	7.733 961 dm ²	7.502 121 dm ²

^a[MART3] reported 1 **pied carrée** (at Ypres) as 7.406 6 dm²

55.18 West Flanders

55.18.1 Units of Length

At Brugge and Westkapelle; at Veurne; and at Ypres

		Metric	Metric	Metric
verge		3.841 6 m	3.893 4 m	3.834 6 m
14	pied	274.4 mm	278.1 mm	273.9 mm

At Kortrijk

		Metric
verge		2.977 m
10	pied	297.7 mm

1 **aune** (for fabric and laces at Menen) = 713.10 mm;

1 **aune** (at Furnes, Roeselare and Tielt) = 700.00 mm;

1 **aune** (at Ypres) = 697.00 mm;

1 **aune** (for linen at Menen) = 693.2 mm;

1 **pas** (at Ypres) = 2½ pieds = 684.75 mm.

55.18.2 Units of Area

At Kortrijk

		Metric
verge carrée		8.862 529 m ²
100	pied carrée	8.862 529 dm ²

55.18.3 Units of Volume

1 **pied cube** (at Ypres) = 20.526 m³.

55.18.4 Units of Dry Capacity

1 **mesure** (for oats at Kortrijk) = 22 L.

55.18.5 Units of Liquid Capacity

55.18.6 Units of Weight

At Bruges; at Diksmuide; at Poperinge; at Tielt; and at Ypres

		Metric	Metric	Metric	Metric	Metric
livre ^a		463.9 g	430.0 g	456.2 g	427.4 g	430.6 g
16	once	28.994 g	26.875 g	28.512 g	26.712 g	26.912 g

^a[MART3] reported 1 livre (at Ypres) = 430.827 g

56 Belize [Formerly: British Honduras]

See also *United Kingdom*.

Mayan culture was spread over this area between *c.* 1500 BCE and *c.* 300 CE. The area was settled by shipwrecked English seamen in 1638. In 1862, it became a British Crown Colony, subordinate to Jamaica, and was established as the separate Crown Colony of British Honduras in 1884. British Honduras became Belize in 1973 and attained full independence in 1981.

Most measures were influenced by English and Spanish weights and measures.

56.1 Currency

1974–:	1 Belizean dollar = 100 cents
1894–1973:	1 British Honduran dollar = 100 cents
1864–1894:	1 pound sterling = 20 shillings = 240 pence = 960 farthings

1855–1864:	1 dollar = 4 sterling shillings = 8 rials
<i>c.</i> 1765–1855:	6 Jamaican shillings 8 pence = 8 reales

56.2 Units of Length

British Imperial scale

		Imperial	Metric
manzana		25 yd	22.86 m
4	mecate	75 ft	5.715 m

56.3 Units of Area

British Imperial scale

		Imperial	Metric
manzana		10,000 yd ²	8361.27 m ²
16	mecate or task	625 yd ²	522.58 m ²

56.4 Units of Dry Capacity

British Imperial scale

							Imperial	Metric
carga							30 gal	136.38 L
1 ¹ / ₁₁	barrel						27 ¹ / ₂ gal	125.02 L
2	1%	cargo or fanega					15 gal	68.191 L
6	5 ¹ / ₂	3	shushack				20 qt	22.730 L
8	7 ¹ / ₃	4	1 ¹ / ₃	benequen			15 qt	17.047 L
24	22	12	4	3	almud ^a		5 qt	5.682 45 L
96	88	48	16	12	4	quartia ^b	2 ¹ / ₂ pt	1.421 L

^aUsually used for cereals

^bAlso reported as 2¹/₂ qt = about 2.841 L

56.5 Units of Liquid Capacity

1 gallon = 1 U.S. gal = 3.785 42 L.

56.6 Units of Weight

British Imperial scale

				Imperial	Metric
cargo or standard mule load				200 lbs	90.718 4 kg
2	quintal			100 lbs	45.359 2 kg
8	4	arroba or block of chicle		25 lbs	11.339 8 kg
200	100	25	libra	1 lb	453.592 g

Metric-linked system at Ouémé during the twentieth century

			Metric
adjandjan			100 kg
5	bassines		20 kg
50	10	tohounglo	2 kg

57.1 Currency

1945–: 1 CFA franc = 100 centimes
1901–1945: 1 West African CFA franc = 100 centimes

c. 1855–1901: 1 French franc = 100 centimes
fourteenth–nineteenth centuries: cypraea shells, but also cowries (here often called simbipuri)

57 Benin [Formerly: Dahomey]

See also *France*.

For a long time, this area was divided into several small kingdoms. During the 1400s, the southern third of present Benin was a prominent West African kingdom called Dahomey. In 1851, the King of Dahomey signed a trade agreement with the French. In 1892, the area, together with Atakora (the northwestern part of present Benin) and the kingdom of Borgu (the northeastern part of present Benin), was taken over by France, becoming a French colony in 1899 and a part of French West Africa, as the Territory of Dahomey, in 1904. Dahomey became independent in 1960 and was renamed as Benin in 1975.

The metric system has been official since 1884, and compulsory since 1891.

Main sources: [BAKA], [DIFF], [GOU], [MART3], [ONAS], [TECH], and [UN66]

57.2 Units of Length

Before colonization, very short distances, such as that of a piece of wood to be carved, were measured by using the distance between the thumb and the first finger as a unit. Short distances, up to about one hundred feet, were measured by counting the number of times they could place one foot in front of the other foot. Very long distances were measured by stating it in days' journeys or by the time between breakfast and lunch or dinner. It was also common to compare distances and heights to tall palm trees, snakes, etc.

Some reported measures:

1 **condu** or **côvado** (at Abomey) = 577.5 mm.

57.3 Units of Area

Some reported measures:

- 1 **kanti** (for agricultural land) = 0.4 ha or 1/30 ha.

57.4 Units of Dry Capacity

During the sixteenth century, the Portuguese brought kegs of gunpowder and many other containers to present-day Benin.

- 1 **epipa** = the capacity of an empty gun powder keg;
1 **ekuye** = the capacity of a spoon.

Below are some units reported during the twentieth century. Sometimes sellers gave an extra amount, called a *brassée*. For some units below, values are given for both one *brassée* and two *brassées*.

For corn:

- 1 **sogolo** = 7.3 L; 7.42 L (with one *brassée*) and 8 L (with two *brassées*);
1 **yebessi** = 7 L; 7.37 L (with one *brassée*) and 7.9 L (with two *brassées*);
1 **lebere** = 5.9 L; 6.52 L (with one *brassée*) and 7.25 L (with two *brassées*);
1 **ike** = 5.43 L; 5.87 L (with one *brassée*) and 6.25 L (with two *brassées*);
1 **adjandjan** = 5.12 L; 5.85 L (with one *brassée*) and 6.1 L (with two *brassées*), also reported by [TECH, p. 143] as 4.29 to 4.83 L.
1 **djogledo** = 5.12 L; 5.5 L (with one *brassée*) and 6 L (with two *brassées*);
1 **abotoca** = 4 L; 4.28 L (with one *brassée*) and 5.06 L (with two *brassées*);
1 **paï** = 3.93 L; 4.15 L (with one *brassée*) and 4.56 L (with two *brassées*);
1 **ke** = 3.9 L; 4.4 L (with one *brassée*) and 5 L (with two *brassées*);
1 **pome** = 3.37 L; 3.58 L (with one *brassée*) and 4 L (with two *brassées*);

- 1 **yorougou** = 3.25 L; 3.75 L (with one *brassée*) and 4 L (with two *brassées*);
1 **ayewa** = 3.2 L; 3.85 L (with one *brassée*) and 4.25 L (with two *brassées*);
1 **otoka** or **agoue** = 3 L; 3.2 L (with one *brassée*) and 3.88 L (with two *brassées*);
1 **yoroukou** = 2.43 L; 2.81 L (with one *brassée*) and 3.12 L (with two *brassées*);
1 (small) **otoka** = 2 L; 2.5 L (with one *brassée*) and 2.62 L (with two *brassées*);
1 **awochobe** = 1.87 L; 2.12 L (with one *brassée*) and 2.62 L (with two *brassées*);
1 **petit sogo** = 1.55 L; 1.9 L (with one *brassée*) and 2.17 L (with two *brassées*);
1 **bol jaune** = 1.4 L; 1.8 L (with one *brassée*) and 2.45 L (with two *brassées*);
1 **tongolo** = 1.4 L; 1.9 L (with one *brassée*) and 2.25 L (with two *brassées*);

For groundnuts and certain other commodities:

- 1 **winninré** (also for pepper and rice) = 14.2 L (stricken measure), 16.1 L (on average), and 18.2 L (brimming-over).⁵
1 (large) **yébessi** (also for grain and shelled groundnuts) = 7 L; 7.37 L (with one *brassée*) and 7.9 L (with two *brassées*);
1 **adjandjan** (also for grains, gari and peanuts in the shell) = 5.12 L or 5.3 L⁶; 5.85 L (with one *brassée*) and 6.10 L (with two *brassées*);
1 **yébessi** (also for grain and shelled groundnuts) = 3.2 L (stricken), 3.9 L (average), and 4.4 L (brimming-over);
1 **yorugou, yorougou, or yorokou** = 3.5 L (average), but also reported as 3.25 L; 3.75 L (with one *brassée*) and 4 L (with two *brassées*).

The *yorugou* measure is said to have been introduced in the 1960s by Yoruba traders in Nikki.

- 1 (larger) **tongolo** (also for gari, maize, rice, and spices) = 1.4 L; 1.9 L (with one *brassée*) and 2.25 L (with two *brassées*);

⁵ [BAKA].

⁶ [ONAS].

- 1 **tongolo** or **onando** (also for gari, maize, rice, and spices) = 1.322 L; also reported as 1.12 L; 1.8 L (with one brassée) and 2.45 L (with two brassées);
- 1 (small) **tongolo** = 1.12 L; 1.8 L (with one brassée) and 2.45 L (with two brassées).

For various types of dry commodity:

- 1 **sogolo** = 7.3 L; 7.42 L (with one brassée) and 8 L (with two brassées);
- 1 **ebere** = 5.9 L; 6.52 L (with one brassée) and 7.25 L (with two brassées);
- 1 **erèbè** = 5.368 L. Also reported as 5.9 L stricken, 6.52 L (with one brassée) and 7.25 L (with two brassées);
- 1 **ike** = 5.43 L; 5.87 L (with one brassée) and 6.25 L (with two brassées);
- 1 **djogledo** = 5.12 L; 5.5 L (with one brassée) and 6 L (with two brassées); according to [ONAS] = 6.35 L;
- 1 **paï** = 4.530 L; also reported as 3.93 L; 4.15 L (with one brassée) and 4.56 L (with two brassées);
- 1 **etikuku** = 2.360 L;
- 1 **ke** = 3.9 L; 4.4 L (with one brassée) and 5 L (with two brassées);
- 1 **agoue** = 3.693 L (on average); also reported as 3.2 L (with one brassée) and 3.88 L (with two brassées);
- 1 **ayewa** = 3.2 L; 3.85 L (with one brassée) and 4.25 L (with two brassées);
- 1 **sogo** = 3.146 L;
- 1 **otoka paysan** = 2.333 L; 3.2 L (with one brassée) and 3.88 L (with two brassées);
- 1 **otoka** = 2.115 L; 2.5 L (with one brassée) and 2.62 L (with two brassées);
- 1 **awochobe** = 1.87 L; 2.12 L (with one brassée) and 2.62 L (with two brassées);
- 1 **petit sogo** = 1.55 L; 1.9 L (with one brassée) and 2.17 L (with two brassées);
- 1 **bol jaune** = 1.4 L; 1.8 L (with one brassée) and 2.45 L (with two brassées).

57.5 Units of Liquid Capacity

Before colonization, liquids were usually measured by weight. When the Portuguese came to the area in the sixteenth century, they brought trade gin to present-day Benin, thereby introducing bottles for measuring liquids.

1 **yewada** = ~4 L;

1 **tobola** = 3.786 L;

1 **igbadja** = 2.951 L;

1 **aboumantan** (for peanut and coconut oil) = 750 mL.

57.6 Units of Weight

Before colonization, the Binis had not developed any standard measures for weights. The weight of loads was calculated in man's head-loads. Certain foodstuffs were measured in baskets and carved calabashes. Most usually, people fixed their own measures and others were obliged to use them.

				Metric
benda				64.12 g
2	benda-off			32.06 g
4	2	engebba		16.03 g
8	4	2	ensanno	8.015 g

For maize

		Metric
gbangbé		22.5 kg or 29.7 kg
30	tohoungodo	750 g or 990 g

Other reported measures:

- 1 **adjandjan** = about 4 kg (according to [DUMK]).

58 Bermuda [Former: Somers Islands]

See also *United Kingdom*.

Bermuda was discovered in 1503 by the Spanish explorer Juan Bermúdez. The islands remained uninhabited until 1609, when a fleet of British colonists was shipwrecked on the reef. The islands were later colonized by the Virginia Company, which claimed the islands beginning in 1612 when 60 British settlers moved there. The country became a crown colony in 1684. A British military base was built in 1797.

The metric system has been official since 1971.

58.1 Currency

- 1970–: 1 Bermudian dollar = 100 cents
 1 US dollar = 100 cents
- 1841–1970 1 Bermuda pound = 20 shillings
 = 240 pence
- 1914: 1 pound sterling = 20 shillings =
 240 pence
- 1793–1841: 1 Bermuda Ship’s Money
- 1616–1793: 1 Hoggen Money

59 Betsimisaraka Tribe

See *Madagascar*.

60 Bhutan

See also *India, Tibet* and *United Kingdom*.

This area was conquered by Tibet in the ninth century. In 1865, the British invaded the southern parts of the area and annexed it to British India. In 1907, a hereditary monarchy was established, and in 1910, the British formally established a protectorate over the country. Bhutan gained its independence from Britain in

1947. In 1949, Bhutan agreed to Indian control of its external affairs.

The traditional system of measurement was a vigesimal system. It was mainly influenced by Arabian systems, Hindu systems and Chinese systems. During the late nineteenth century, some British measures, such as the yard, mile, acre, and pound, came into common use. The Metric system has been compulsory since 1959.

Main sources: [MCCO] and [SCOT7]

60.1 Currency

- 1980–: 1 Bhutanese ngultrum =
 100 chhertums
- 1974–1979: 1 Bhutanese ngultrum =
 100 chetrum
- 1964–1974: 1 Indian rupee = 100 chetrum
- 1957–1964: 1 Indian rupee = 100 naye paise
- 1928–1957: 1 Bhutanese rupee = 2 tickchung
- 1907–1957: 1 Indian rupee = 16 annas =
 64 paise

60.2 Units of Length

Some reported measures:

- 1 yard = 914.39 mm;
- 1 angul = ~10 mm.

60.3 Units of Area

For valley land in the Terai area

बिघा	कट्ठा		Metric
bigha, beega, beegah, biga, or biggah^a			6771.41 m ²
20	kattha or katha		338.57 m ²
400	20	dhur	16.93 m ²

^aIn some areas, during the nineteenth century, reported as about 1.48 ha

Some other reported measures:

- 1 **acre** = about 4048 m²;
- 1 **langdo** (for agricultural land in the Wangdiprdan area) = the area that a pair of oxen can plow in a day, usually said to equal ~1/7 ha if the land is dry and ~1/10 ha for a wet paddy field;⁷
- 1 **soendre** (for agricultural land) = ~200 m²;
- 1 **khe** (for agricultural land) = a piece of cultivated land upon which 14 kg of barley or wheat may be sown; the area varies because of land quality.

60.4 Units of Weight

Some measures reported during the early twentieth century:

- 1 **khe** (for cereals) = ~14 kg;
- 1 **pound** = 453.592 g.

Metric-linked system

				Metric
ton				1000 kg
10	quintal			100 kg
23⅓	2⅔	maund		37.5 kg
1000	100	37½	kilo	1 kg

61 Biafra

See also *Nigeria*.

In May 1967, the Eastern Nigerian Region’s military governor announced the founding of the Republic of Biafra. Biafra was unrecognized as an independent state and became reabsorbed, after the Nigerian Civil War, into Nigeria in early 1970.

61.1 Currency

1968–1970: 1 Biafran pound = 20 shillings = 240 pence

62 Bismarck Archipelago

See *Papua New Guinea*.

63 Bohemia

See also *Austrian-Silesia*, *Czech Republic*, *Moravia* and *Silesia*.

The Kingdom of Bohemia was part of the Holy Roman Empire. King Ottokar II of Bohemia (1253–78) acquired Austria, Carinthia and Styria, thus spreading the territory to the Adriatic Sea. After the fall of the Holy Roman Empire, the area became part of the Austrian Empire, and later of the Austro-Hungarian Empire until the country gained its independence in 1918. In 1938, the northern and southern parts of Moravia were joined with Silesia. In 1939, Slovakia unilaterally declared independence, and Bohemia and the central parts of Moravia were occupied by the Germans, who referred to the occupied area as the “Protectorate of Bohemia and Moravia.” The Czechoslovak Republic was reconstituted in 1945, only to be separated into the Czech and Slovak Republics in 1993.

In 1258, during the reign of Ottokar II (1253–78), Bohemia got a uniform measurement system. The metric system has been official since 1871 and compulsory since 1876.

Main sources: [MART3] and [ROTT2]

63.1 Currency

1 Gulden = 1⅓ Groschen = 16 Heller

⁷ See also [MCCO, p. 40].

63.2 Units of Length

In Prague before 1268:

1 **provazec zemský** (during the reign of Ottokar II (1253–78)) = 25.26 m.

In Prague in 1268

								Metric
prut								4.733 711 5 m
2	latro							2.366 855 7 m
$2\frac{2}{3}$	$1\frac{1}{3}$	sáh						1.775 141 8 m
8	4	3	loket					591.714 mm
24	12	9	3	píd'				197.238 mm
60	30	$22\frac{1}{2}$	$7\frac{1}{2}$	$2\frac{1}{2}$	dlaň			78.895 mm
240	120	90	30	10	4	prst		19.724 mm
960	480	360	120	40	16	4	barley grain	4.931 mm

In Prague in 1268:

1 **Land-Seil** or **Wald-Seil** = 25.012 m;

1 **Teich-Seil** = 13.198 m;

1 **Elle** (at Prague) = 592.710 53 mm;

Upper scale after 1258

								Metric
míle česká^a								7529.76 m
60	hon^b							125.496 m
$196\frac{7}{8}$	$3\frac{3}{32}$	provazec vinicný^c						38.246 4 m
$572\frac{8}{11}$	$9\frac{9}{11}$	$2\frac{10}{11}$	provazec rybářský^d					13.147 2 m
1575	$26\frac{1}{4}$	8	$2\frac{3}{4}$	prut				4.780 8 m
3150	$52\frac{1}{2}$	16	$5\frac{1}{2}$	2	látro			2.390 4 m
4200	70	$21\frac{1}{3}$	$7\frac{1}{3}$	$2\frac{2}{3}$	$1\frac{1}{3}$	sáh staročeský^e		1.792 8 m
12,600	210	64	22	8	4	3	loket pražský	597.6 mm

^aIts value was different at different times and in different places

^bIn concept, the distance a man could walk without a rest

^cA rod used in vineyards

^dA fishing rod

^eThe old Czech fathom

Lower scale after 1258

							Metric
loket pražský							597.6 mm
3	píd'						199.2 mm
4	$1\frac{1}{3}$	čtvrť					149.4 mm
$7\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{7}{8}$	dlaň				79.68 mm
30	10	$7\frac{1}{5}$	4	prst			19.92 mm
120	40	30	16	4		zrno ječné	4.98 mm

In Prague during the reign of Charles IV
(1346–78):

1 **Land-Seil** = 37.356 m;

1 **provazec zemský** = 30.88 m;

1 **Weingarten-Seil** = 7.113 m.

During the fourteenth century

			Metric
prut			2.92 m
2	látro		1.46 m
8	4	loket	365 mm

In Prague before 1628

										Metric
Rute										4.773 711 5 m
2	Lachter									2.366 855 7 m
2 $\frac{2}{3}$	1 $\frac{1}{3}$	Klafter								1.775 141 8 m
8	4	3	Elle							596.714 mm
16	8	6	2	Fuss						295.857 mm
24	12	9	3	1 $\frac{1}{2}$	Spanne					197.238 mm
60	30	22 $\frac{1}{2}$	7 $\frac{1}{2}$	3 $\frac{3}{4}$	2 $\frac{1}{2}$	Querhand				78.895 mm
180	90	72	24	12	6	3	Zoll			26.298 mm
240	120	90	30	15	10	4	1 $\frac{1}{4}$	Querfinger		21.039 mm
960	480	300	120	60	40	16	5	4	Gerstenkorn (barley grain)	5.260 mm
2304	1152	864	288	144	96	38 $\frac{2}{5}$	12	9 $\frac{3}{5}$	2 $\frac{2}{5}$	Linie 2.191 mm

In Prague after 1628:

										Metric
Landseil										30.820 920 m
4 $\frac{2}{3}$	Weingarten-Seil									7.112 52 m
6 $\frac{1}{2}$	1 $\frac{1}{2}$	Ruthe^a								4.741 68 m
13	3	2	(Bergwerks-) Lachter^a							2.370 84 m
17 $\frac{1}{3}$	4	2 $\frac{2}{3}$	1 $\frac{1}{3}$	Klafter						1.778 13 m
52	12	8	4	3	Elle					592.710 mm
104	24	16	8	6	2	Schuh				296.355 mm
1248	288	192	96	72	24	12	Zoll			24.696 mm
14,976	3456	2304	1152	864	288	144	12	Linie		2.058 mm

^aUsed until 1760

In Prague after 1764

										Metric
lân										7471.80 m
4	čtvrť									1867.95 m
12	3	prut								622.650 m
60	15	5	jitro							124.530 m
300	45	25	5	zemský provazec						24.906 m
12,600	1890	1050	210	42	loket^a					593 mm
37,800	5670	3150	630	126	3	píd'				197.67 mm
94,500	14,175	7875	1575	315	7½	2½	dlaň			79.07 mm
378,000	56,700	31,500	6300	1260	30	10	4	prst		19.77 mm
1,512,000	226,800	126,000	25,200	5040	120	40	16	4	zrno	4.94 mm

^aA model was placed in the New Town Hall Tower in Prague

Lower Austrian scale in Prague before 1855

							Metric
Post-Meile							7585.935 36 m
4000	Klafter or Vídeňský sáh						1.896 483 84 m
24,000	6	Fuss					316.080 6 mm
72,000	18	3	Faust				105.360 mm
288,000	72	12	4	Zoll or palec			26.340 mm
3,456,000	864	144	48	12	Linie		2.195 mm

1 **Wiener Elle** = 777.558 mm

Lower Austrian scale in Prague after 1855

					Metric
Meile					7484 m
3150	Dumplachter				2.376 m
12,600	4	Elle^a			593.97 mm
25,200	8	2	Fuss		296.379 67 mm

^aAlso reported as 593.914 35 mm

Bohemian upper system

					Metric
Meile					7498.512 000 m
–	Landseil^a				30.946 240 m
1575	6½	Ruthe			4.760 960 m
3150	13	2	Lachter		2.380 480 m
12,600	52	8	4	Elle	595.120 mm

^aAccording to [KAHN] = 52 Bohemian Ellen = 30.95 m. It has also been reported as 30.820 92 m

Bohemian lower system

			Metric
Klafter			1.778 280 m
6	Fuss		296.380 mm
72	12	Zoll	24.698 mm

Other reported measures:

- 1 **uhorská míľ'a** (Hungarian mile) = 8533.6 m.
 1 **Elle** (at Karlovy Vary) = 676.475 mm
 (as grosse Elle) and 610.559 mm
 (as kleine Elle).

For coarse linen yarn, according to Italian patent 3.8.1750

						Metric
Stück						11,380.042 m
6	Strähn					1896.673 6 m
12	2	Zaspel				948.336 840 m
240	40	20	Gebinde			47.416 842 m
4800	800	400	20	Faden		2.370 842 1 m
19,200	3200	1600	80	4	Elle	592.710 53 mm

For coarse linen yarn, according to Italian patent 1.3.1753

						Metric
Stück						11,380.042 m
4	Strähn					2845.010 5 m
12	3	Zaspel				948.336 840 m
240	60	20	Gebinde			47.416 842 m
4800	1200	400	20	Faden		2.370 842 1 m
19,200	4800	1600	80	4	Elle	592.710 53 mm

For fine linen yarn in 1750

						Metric
Stück						8535.031 6 m
6	Strähn					1422.505 2 m
12	2	Zaspel				711.252 63 m
240	40	20	Gebinde			35.562 631 m
4800	800	400	20	Faden		1.778 131 5 m
14,400	2400	1200	60	3	Elle	592.710 53 mm

For fine linen yarn in 1753

						Metric
Stück						8535.031 6 m
4	Strähn					2133.757 9 m
12	3	Zaspel				511.252 63 m
240	60	20	Gebinde			35.562 631 m
4800	1200	400	20	Faden		1.778 131 5 m
14,400	3600	1200	60	3	Elle	592.710 53 mm

For linen yarn

			Metric
Schock			35.562 631 m
3	Steige		11.854 210 m
60	20	Elle	592.710 53 mm

For tissue

			Metric
Fass Golschen			1280.254 700 m
30	Stück Golschen		42.675 158 m
2160	72	Elle	592.710 53 mm

For cloth

			Metric
Bartel			586.783 420 m
45	Barchant		13.039 631 m
990	22	Elle	592.710 53 mm

For sheep wool

					Metric
Strähn or Strang					1642.202 40 m
4	Viertel				410.550 62 m
24	6	Klapp or Gebinde			68.425 104 m
1056	264	44	Faden		1.555 116 m
2112	528	88	2	Vienna Elle	777.558 mm

Alternative scale for sheep wool (1 Faden = 3 Vienna Ellen)

					Metric
Strähn or Strang					2463.303 70 m
4	Viertel				615.825 93 m
24	6	Klapp or Gebinde			102.637 50 m
1056	264	44	Faden		2.332 674 m
3168	792	132	3	Vienna Elle	777.558 mm

Alternative scale for sheep wool (1 Strähn = 20 Klapp)

					Metric
Strähn or Strang					1368.502 00 m
4	Viertel				342.125 52 m
20	5	Klapp or Gebinde			68.425 104 m
880	220	44	Faden		1.555 116 m
1760	440	88	2	Vienna Elle	777.558 mm

Alternative scale for sheep wool (1 Strähn = 22 Klapp)

					Metric
Strähn or Strang					1505.352 20 m
4	Viertel				376.338 07 m
22	5½	Klapp or Gebinde			68.425 104 m
968	242	44	Faden		1.555 116 m
1936	484	88	2	Vienna Elle	777.558 mm

63.3 Units of Area

Austrian scale at Prague after 1250

					Metric
Hube					187,680 m ²
4	Viertel Lan				46,920 m ²
12	3	Quadrat-Rute			15,640 m ²
60	15	5	Strich Saatland		3128 m ²
300	75	25	5	Quadrat-Landseil	625.6 m ²

Other reported measures:

- 1 **Gewende-Acker** = 2877.321 6 m²;
 1 **Quadrat-Teichseil** = 170.031 97 m²;
 1 **Quadrat-Weingartenseil** = 50.588 026 m².

During the reign of Ottokar II (1253–78):

- 1 **lán selský** = 18.62 m²;
 1 **jitro staročeské** = 31.5 dm².

Austrian scale in Prague in 1300

			Metric
Strich Saatland			2849.792 1 m ²
3	Quadrat-Landseil		949.930 7 m ²
8112	2704	Quadrat-Elle	35.130 57 dm ²

During the reign of Charles IV (1346–78)

			Metric
lán			184,148.16 m ²
256	věrtel		719.33 m ²
5120	20	lán rabínský	35.946 m ²

Upper scale from 1764 until 1876

						Metric
lán						172,639.2 m ²
30	jitro					5754.64 m ²
60	2	korec				2877.315 m ²
90	3	1½	mira or merice			1918.21 m ²
48,000	1600	800	533⅓	čtverečný (řemenový) sáh		3.596 652 m ²
288,000	9600	4800	3200	6	řemenová stopa	59.944 2 dm ²

Lower scale from 1764 until 1876

						Metric
řemenová stopa						59.944 2 dm ²
6	čtverečná stopa					9.990 694 4 dm ²
12	2	řemenový palec				4.995 35 dm ²
144	24	12	řemenová čárka			41.627 9 cm ²
1728	288	144	12	řemenová tečka		3.452 33 cm ²

Austrian scale for fields at Prague in 1350

			Metric
Strich Saatland			2877.896 4 m ²
2	Quadrat-Landseil		1438.948 2 m ²
8192	4096	Quadrat-Elle	35.130 57 m ²

Austrian scale for vineyards at Prague in 1350

			Metric
Weingarten			2 877.896 4 m ²
128	Weingarten-Quadratrute		22.483 566 m ²
8 192	64	Quadrat-Elle	35.130 57 m ²

During the fifteenth–seventeenth centuries:

- 1 **Rain**⁸ (for land area used for growing hops) = unknown magnitude.

During the seventeenth century:

- 1 **role** = 61 dm².

⁸ See www.genealogienetz.de/reg/SUD/bmasse.html.

Lower Austrian scale at Prague in 1765

					Metric
Stallung or Wald					115,092.864 m ²
20	Joch^a				5754.643 2 m ²
40	2	Strich-Saatland			2877.321 6 m ²
60	3	1½	Metzen Aussaat		1918.214 4 m ²
32,000	1600	800	533⅓	Quadratklafter	3.596 652 m ²

^a1 Joch was still mentioned as the amount of field that could be ploughed by a pair of harnessesd oxen in one day

Bohemian system at Prague

			Metric
Strich Aussaat			2873.009 3 m ²
3	Quadrat-Landseil		957.669 8 m ²
8112	2704	Quadrat Elle	35.416 8 dm ²

At Chodenwald in Oberfaltz (now a part of Bavaria in Germany) before 1780, according to [BLAU2]

					Metric
Joch					~5800 m ²
1¾	Strich				~3300 m ²
2⅔	1⅓	Schnur			~2500 m ²
3	1½	1⅘	Metzen		~1900 m ²
1600	800	600	533⅓	Quadratklafter	~3.6 m ²

Other local measures during the eighteenth century:

- 1 **lán královský** (royal acre) = 27.95 m²;
- 1 **lán kněžský** (priestly acre) = 25.61 m²;
- 1 **lán panský** (at Panský in present-day Czech Republic) = 23.28 m²;
- 1 **lán pasovský** (at Passau in present-day Germany) = 17.737 2 m².
- 1 **jítro rabínské** = 59.11 dm²;
- 1 **jítro pasovské** = 34.11 dm².

At Passau in present-day Germany

		Metric
lán pasovský		17.737 2 m ²
520	jítro pasovské	34.11 dm ²

At Vitějovice in present-day Czech Republic

		Metric
lán vitějovický		10.937 6 m ² or 9.624 m ²
60	jítro vitějovický	17.09 dm ² or 16.04 dm ²

Two reported Austrian scales

			Metric	Metric
Joch			5755.74 m ²	5060.330 m ²
2	Strich aussaat		2877.87 m ²	2530.165 m ²
1600	800	Quadratklafter	3.597 34 m ²	3.162 707 m ²

Traditional system in Bohemia during the early nineteenth century

					Metric
Stochiacah					8931.39 m ²
2	Tagmat				4465.695 m ²
2 $\frac{2}{9}$	1 $\frac{1}{9}$	Jauchert			4019.125 m ²
4	2	1 $\frac{1}{5}$	Starland		2232.847 m ²
5	2 $\frac{1}{2}$	2 $\frac{1}{4}$	1 $\frac{1}{4}$	Graber	1786.278 m ²

63.4 Units of Volume

Some reported measures:

- 1 **Holzklafter** (for firewood at Prague before 1770) = 6 Bohemian Fuss \times 6 Bohemian Fuss \times 1 Prague Elle) = 1.867 706 8 m³.
 1 **Holzklafter** (for firewood at Prague after 1770, = 1 Viennan Klafter \times 1 Viennan Klafter \times 1 Moravian Elle) = 2.796 988 5 m³;
 1 **Bergkübel** (for brown coal) = 46.631 125 L.

63.5 Units of Dry Capacity

Some older reported measures:

- 1 böhmischer **Strich** (in Prague, as reported in 1639) = 99.292 L;
 1 **Strich** (in Prague, as reported in 1670) = 98.650 L.

Czech scale used from 1764 until 1876

						Metric
krychlový sáh						6820.992 L
120	vědro					56.841 6 L
216	1 $\frac{1}{5}$	krychlová stopa				31.578 67 L
4800	40	22 $\frac{2}{9}$	máz			1.421 04 L
9600	80	44 $\frac{4}{9}$	2	holba		710.5 mL
18,960	158	87 $\frac{7}{9}$	3 $\frac{19}{20}$	1 $\frac{39}{40}$	žejdlík	359.8 mL

In Prague before 1764, after 1764 and after 1855

					Metric	Metric	Metric
Strich					99.262 L	93.587 2 L	93.362 202 L
4	Viertel				24.815 5 L	23.396 8 L	23.340 550 5 L
16	4	Metzen			6.203 875 L	5.849 2 L	5.835 137 6 L
32	8	2	Maassl		3.101 937 5 L	2.924 6 L	2.917 568 8 L
64	16	4	2	Käüfl	1.550 968 75 L	1.462 3 L	1.458 784 4 L

Bohemian scale used before 1876, based on [ROTT2], and [MART3]

					Metric	Metric
Strich^a or Scheffel					93.582 9 L	93.362 250 L
4	Viertel or Sturz				23.395 7 L	23.340 562 L
16	4	Metzen			5.848 9 L	5.835 141 L
48	12	3	Pinte		1.949 6 L	1.945 047 L
192	48	12	4	Seidel	487.4 mL	486.262 mL

^aStricken measure. 1 **Strich** (gehäuften Masses) = 107.6 L

Lower Austrian scale used until the mid-nineteenth century

				Metric
Wiener Metzen				61.486 8 L
4	Viertel Metzen			15.371 7 L
8	2	Achtel Metzen		7.685 8 L
16	4	2	Massel	3.842 9 L

Alternative scale reported during the late nineteenth century

				Metric
Strich				93.609 8 L
4	Viertel			23.402 4 L
16	4	Maassl		5.850 6 L
192	48	12	Seidel	487.551 mL

For mining

		Metric
Seidel		480 mL
4	Kübel	120 mL

At Cheb during the thirteenth century, level measure and heaped measure

		Metric	Metric
Kahr		301.894 4 L	309.355 L
8	Massl	37.736 8 L	38.669 4 L
32	4	Napf	9.434 2 L
			9.667 3 L

For general use and for oats at Cheb during the nineteenth century

		Metric	Metric
Kahr		298.759 L	308.0 L
32	Napf	9.336 L	9.625 L

63.6 Units of Liquid Capacity

Old Bohemian system, based on [ROTT2], and Bohemian system in Prague, based on [MART3]

				Metric	Metric
Fass				244.454 4 L	244.480 000 L
4	Eimer			61.113 6 L	61.120 000 L
128	32	Pint		1.909 8 L	1.910 000 L
512	128	4	Seidel	477.45 mL	477.500 mL
2048	512	16	4	Viertling	119.36 mL
					119.375 mL

Austrian system

					Metric
Wiener Fass					226.355 8 L
4	Wiener Eimer				56.588 9 L
160	40	Wiener Mass			1.414 72 L
320	80	2	Wiener Halbe		707.362 mL
640	160	4	2	Wiener Seidel	353.681 mL

For wine

					Metric
Weinfass					244.535 L
4	Eimer				61.133 7 L
$5\frac{7}{5}$	$1\frac{7}{20}$	Maass			46.578 L
$124\frac{4}{9}$	32	$23\frac{19}{27}$	Pinte		1.965 L
$497\frac{7}{9}$	128	$98\frac{86}{27}$	4	Seidel	491.253 mL

For beer

			Metric
Eimer			61.453 L
32	Pint		1.920 L
128	4	Seidel	480.1 mL

For general use in Prague after 1268

							Metric
vedro or Eimer							43.835 L
2	Achtel						21.917 5 L
4	2	soudsky or Massfässlein					10.958 7 L
8	4	2	lahvice or Masslage				5.479 4 L
24	12	6	3	Pint			1.826 5 L
96	48	24	12	4	Seitel		456.61 mL
192	96	48	24	8	2	Halbseitel	228.31 mL
384	192	96	48	16	4	2	Quarte 114.15 mL

For beer in Prague after 1268

					Metric
Kufe					687.524 97 L
3	Fass				229.174 99 L
12	4	Eimer			57.293 748 L
360	120	30	Pint		1.909 79 2 L
1440	480	120	4	Seitel	477.45 mL

For beer in Prague after 1855

					Metric
Kufe					733.393 44 L
3	Fass				244.464 48 L
12	4	Eimer			61.116 12 L
384	128	32	Pint		1.909 88 L
1536	512	128	4	Seitel	477.47 mL

For mercantile use

					Metric
Centner					61.722 kg
6	Stein				10.287 kg
120	20	Pfund			514.354 2 g
3840	640	32	Loth		16.073 6 g
15,360	2560	128	4	Quentchen	4.018 4 g

Other reported measures:

- 1 **Metzen** (in Turnov as reported in 1670) = 30.477 7 L;
- 1 **Ortsmass** (in Dačice) = 2.560 652 2 L;
- 1 **Ortsmass** (at Slavonice) = 1.881 584 2 L.

63.7 Units of Weight

Vienna system used from 1764 until 1876

			Metric
vídeňský cent			56.006 kg
100	vídeňská libra		560.060 g
3200	32	vídeňský lot	17.501 875 g

In Prague during the late fifteenth century and old Bohemian scale as reported in 1855

							Metric	Metric
Zentner							61.670 76 kg	61.727 796 kg
6	Stein						10.278 46 kg	10.287 966 kg
120	20	Pfund					513.923 g	514.398 3 g
480	80	4	Vierling				128.481 g	128.599 6 g
3840	640	32	8	Loth			16.060 g	16.074 9 g
7680	1280	64	16	2	Setten		8.030 g	8.037 5 g
15,360	2560	128	32	4	2	Quentchen or Quentel	4.015 g	4.018 7 g

Lower Austrian scale during the mid-nineteenth century

											Metric
Zentner											56.006 0 kg
5	Stein										11.201 2 kg
100	20	Pfund									560.060 0 g
200	40	2	Mark								280.030 0 g
1600	320	16	8	Unze							35.003 7 g
3200	640	32	16	2	Loth						17.501 9 g
4800	960	48	24	3	1½	Karat					11.667 9 g
12,800	2560	128	64	7	4	2⅔	Quintel				4.375 5 g
51,200	10,240	512	256	28	16	10⅔	4	Pfenniggewicht			1.093 9 g
768,000	153,600	7680	3840	420	240	160	60	15	Gran		72.9 mg
2,304,000	460,800	23,040	11,520	1260	720	480	180	45	3	Grän	24.3 mg

For cereals (wheat, rye, and oats) during the fourteenth–sixteenth centuries

			Metric	Metric	Metric
Kar			~243 kg	~225 kg	~190 kg
8	Metzen		~30.4 kg	~28.1 kg	~23.7 kg
32	4	Napf	~7.6 kg	~7.0 kg	~5.9 kg

For coal, stones, mining, and commercial use, based on [MART3]

								Metric
Bergcentner								74.073 355 kg
1½	Centner							61.727 796 kg
7½	6	Stein						10.287 966 kg
144	120	20	Pfund					514.398 g
4608	3840	640	32	Loth				16.075 g
18,432	15,360	2560	128	4	Quentchen			4.019 g
73,728	61,440	10,240	512	16	4	Sechzehntel		1.005 g

Metric-linked system

		Metric
celní cent		50 kg
100	celní libra	500 g

Monetary weights used from 1764 until 1876

		Metric
kvintlík		4.375 468 75 g
4	šestnáctina	1.093 867 187 5 g

For gold and silver, based on [ROTT2], and in Prague, based on [MART3]

			Metric	Metric
Pfund			511.476 4 g	511.520 400 g
2	Mark		255.738 2 g	255.760 200 g
16	8	Unze	31.967 3 g	31.970 025 g

Some other reported measures:

- 1 **lékárenská libra** (for medical use from 1764 until 1876) = 420.045 g;
- 1 **vídeňská marková stříbrná váha** (for silver from 1764 until 1876) = 280.668 g;
- 1 **vídeňský karát** (for fine use from 1764 until 1876) = 205.969 mg.

64 Bohemia and Moravia

See *Bohemia, Czech Republic, Moravia* and *Silesia*.

64.1 Currency

1939–1945: 1 Bohemian and Moravian koruna = 100 haléřů

65 Bolivia [Formerly: Upper Peru, Charcas]

See also *Acre, Peru* and *Spain*.

Much of present-day Bolivia was first dominated by the Tiahuaneco Culture c. 400 BCE. The Bolivian territory had become incorporated into the Incan Empire by 1440

CE. The Spanish Empire conquered the region in 1535. The area was called Upper Peru or Charcas and was under the administration of the Vice-Royalty of Peru. Independence was declared in 1825. From 1836–39, the country was joined in a federation with Peru. Bolivia was once again declared independent in 1842.

The Spanish system of weights and measures were used until the early twentieth century. The Metric system has been official since 1868, legally optional since 1871 and compulsory since 1893.

Main sources: [DIRE3], [ECON], [MINI], [MINI2], [MART3], [UN55], and [UN66]

65.1 Currency

1987–: 1 Bolivian boliviano = 100 centavos
 1963–1987: 1 Bolivian peso boliviano = 100 centavos
 1870–1963: 1 Bolivian boliviano = 100 centavos
 1863–1869: 1 Bolivian boliviano = 8 soles = 100 centécimos
 1825–1863: 1 Bolivian scudo = 16 soles or sueldos
 c. 1790–1827: 1 Spanish escudo = 2 pesos = 16 reales

65.2 Units of Length

After 1801 and after 1825

					Metric	Metric
legua					5199.298 m	5390 m
40	ladre				129.982 m	134.66 m
6220	155½	vara^a			835.90 mm	866 mm
18,660	466½	3	pie		278.63 mm	289 mm
223,920	5598	36	12	pulgada	23.22 mm	24.06 mm

^a[MART3] reported it as 847.500 mm

Other reported measures:

1 **yard** (used in international trading) = 914.392 mm.

65.3 Units of Area

		Metric
manzana de azúcar ^a		7056 m ²
9408	vara cuadrada	75 dm ²

^a[MART3] reported it as only 84 m²

Scale based on [MART3]

		Metric
topo		3591.281 2 m ²
5000	vara cuadrada	71.825 6 dm ²

65.4 Units of Dry Capacity

		Metric
arroba ^a		30.285 L
15	azumbre	2.019 L

^aAlso reported as 30.46 L

65.5 Units of Liquid Capacity

			Metric
barrica			241.418 496 L
6⅘	botija		35.502 720 L
14 ²⁴ / ₂₅	2⅘	odre or arroba	16.137 600 L

Other reported measures:

1 galón (for international trading) = 3.785 310 L.

65.6 Units of Weight

										Metric
cajón										2300.464 500 kg
2½	tonelada									920.185 800 kg
25	10	fanega								92.018 580 kg
33⅓	13⅓	1⅓	carga							69.013 935 kg
50	20	2	1½	quintal						46.009 290 kg
66⅔	26⅔	2⅔	2	1⅓	bulto					34.506 966 kg
200	80	8	6	4	3	arroba				11.502 322 kg
5000	2000	200	150	100	75	25	libra or arratel			460.093 g
10,000	4000	400	300	200	150	50	2	marco		230.046 g
81,750	32,700	3270	2452½	1635	1226¼	408¾	16⅔ ₂₀	8⅞ ₄₀	onza	28.14 g

Other weights reported during the nineteenth century:

- 1 carga (for rice) = 15 arrobas = 172.534 830 kg;
- 1 fanega (for wheat) = 137½ libbras di Castiglia = 63.262 427 kg;
- 1 sexto = 2⅓ arrobas = 26.838 751 kg;
- 1 cesto (for coca) = 25 libbras di Castiglia = 11.502 322 kg.

65.7 Beni

65.7.1 Units of Area

- 1 almud (at Loreto) = 7056 m²;
- 1 tarea (at Riberalta, Santa Ana, Vaca Diez and Villa Bella) = 1000 m²;
- 1 almud (at Santa Ana) = 640 m².

At Reyes, San Borja and San Ignacio

		Metric
almud		8400 m ²
10	tarea	840 m ²

65.7.2 Units of Liquid Capacity

- 1 galón (at Villa Bella) = 5 L;
- 1 botella (at Reyes) = 750 mL;
- 1 botella (at Cercado and Santa Ana) = 660 mL;
- 1 botella (at San Ignacio) = 650 mL;
- 1 botella (for alcoholic beverage at Vaca Diez) = 590 mL.

At Baures

		Metric
arroba		16 L
22%	botella	700 mL

For alcoholic beverage at Loreto

		Metric
galón		4 L
6¼	botella	640 mL

65.7.3 Units of Weight

- 1 **carretada** (for fruit at Loreto) = 287.5 kg;
 1 **caja** (for chestnuts at Vaca Diez) = 23 kg;
 1 **mazo** (for tobacco at Rayes and Villa Bella) = 1 kg;
 1 **mazo** (for tobacco at Loreto, San Borja and San Joaquin) = 920 g;
 1 **mazo** (for tobacco at Trinidad) = 900 g.

For chestnuts at Villa Bella

		Metric
barrica		66 kg
3	caja	22 kg

65.8 Chuquisaca**65.8.1 Units of Length**

- 1 **cabalgada** (at Monteagudo) = 3 m;
 1 **brazada** (at Hernando Siles) = 1.70 m;
 1 **brazada** (at Monteagudo and Sud Cinti) = 1.68 m;
 1 **brazada** (at Zudañez) = 1.67 m.

At Tarabuco

		Metric
lazo		8.40 m
5¼	brazada	1.60 m

65.8.2 Units of Area

- 1 **carga** (at Zuadañez) = 7000 m²;
 1 **olla** (at Villa Busch) = 5873 m²;
 1 **olla** (at Yotala) = 100 m²;
 1 **arroba** (at Padilla) = 50 m².

At Azurduy

			Metric
fanega			360 m ²
6	olla		60 m ²
24	4	almund	15 m ²

At Camargo

		Metric
fanega		28 976 m ²
8	olla	3 622 m ²

At Tarabuco

				Metric
fanega				350 m ²
1½	carga			300 m ²
5%	5	olla		60 m ²
7	6	1½	arroba	50 m ²

65.8.3 Units of Liquid Capacity

- 1 **arroba** (at Zudañez) = 15 L;
 1 **tinaja** (for chicha at Hernando Siles) = 15 L;
 1 **arroba** (at Hernando Siles, Monteagudo and Padilla) = 13.5 L;
 1 **cuartilla** (at Azurduy, Hernando Siles and Yotala) = 3.37 L;
 1 **frasco** (at Yotala) = 3.25 L;
 1 **botella** (for milk and honey at Zudañez) = 670 mL;
 1 **jarra** (for milk at Yotala) = 500 mL;
 1 **vaso** (for chicha at Yotala) = 500 mL;
 1 **botella** (at Monteagudo) = 460 mL.

At Azurduy

			Metric
quintal			60 L
4%	arroba		13.5 L
17%	4	cuartilla	3.37 L

At Camargo

				Metric
quintal				54 L
1⅓ ₃₁	botija			46.5 L
4	3%	arroba		13.5 L
14%	12%	3%	cuartilla	3.75 L

At Sud Cinti

			Metric
botija			25.85 L
3 ⁴¹ / ₂₂₅	cuartilla		8.12 L
39%	12½	botella	650 mL

At Tarabuco

				Metric
quintal				34 L
$4\frac{8}{15}$	jarra			7.5 L
$9\frac{9}{15}$	2	cuartilla		3.75 L
$51\frac{17}{33}$	$11\frac{12}{33}$	$5\frac{45}{66}$	botella	660 mL

For chicha at Tarabuco

		Metric
hera puyñu		75 L
$2\frac{1}{2}$	phisu puyñu	30 L

At Villa Busch

		Metric
arroba		12 L
$3\frac{1}{5}$	cuartilla	3.75 L

65.8.4 Units of Weight

- 1 **peará** (for fertilizer at Sud Cinti) = 1380 kg;
 1 **carretada** (for firewood and maize at Monteagua) = 598 kg;
 1 **fanega** (for grain at Azurduy) = 93.40 kg;
 1 **fanega** (for barley and wheat at Villa Serano) = 92 kg;
 1 **fanega** (for wheat at Sud Cinti) = 90.72 kg;
 1 **fanega** (for grain at Camargo) = 85.10 kg;
 1 **fanega** (for grain at Padilla) = 80.5 kg;
 1 **fanega** (for barley and wheat at Villa Busch) = 80.5 kg;
 1 **fanega** (for wheat at Tarabuco) = 80.5 L;
 1 **fanega** (for flour at Tarabuco) = 78.2 kg;
 1 **fanega** (for grain at Sucre) = 76 kg;
 1 **tercio** (for grain at Azurduy) = 75 kg;
 1 **fanega** (for flour at Hernando Siles) = 69 kg;
 1 **fanega** (for flour and wheat at Yotala) = 69 kg;
 1 **carga** (at Azurduy) = 103.5 kg (for potatoes and ocas) and 64.4 kg (for barley);
 1 **carga** (at Camargo) = 81 kg (for grain), 73.6 kg (for potatoes) and 62.1 kg (for maize);
 1 **carga** (at Zudañez) = 80.9 kg (for ocas and potatoes), 62.5 kg (for barley) and 46 kg (for chuño);
 1 **carga** (for potatoes and wheat at Padilla) = 80.5 kg;

- 1 **carga** (at Villa Serrano) = 80.5 kg (for potatoes) and 69 kg (for barley);
 1 **carga** (at Tarabuco) = 78.2 kg (for potatoes) and 62.1 kg (for barley);
 1 **carga** (for potatoes and maize at Villa Busch) = 73.6 kg;
 1 **tercio** (for maize at Padilla) = 71.3 kg;
 1 **tercio** (for muko (a salivated flour used to make a type of chichi) at Padilla) = 69 kg;
 1 **tercio** (for maize at Villa Serrano) = 69 kg;
 1 **tercio** (for maize at Tarabuco) = 62.1 kg;
 1 **carga** (for potatoes at Hernando Siles) = 59.8 kg;
 1 **carga** (for grain at Monteagudo) = 59.8 kg;
 1 **tercio** (for grain at Sucre) = 58 kg;
 1 **carga** (for maize at Luis Calvo) = 57.5 kg;
 1 **carga** (for potatoes at Sucre) = 57.5 kg;
 1 **tercio** (for muko at Hernando Siles) = 57.5 kg;
 1 **tercio** (for muko and harina at Monteagudo) = 57.5 kg;
 1 **carga** (at Yotala) = 57.5 kg (for potatoes) and 46 kg (for grain);
 1 **tercio** (for maize at Yotala) = 57 kg;
 1 **chipa** (for chile peppers at Tarabuco) = 23 kg;
 1 **olla** (for maize at Sud Cinti) = 18.14 kg;
 1 **piquera** (for fruit at Sud Cinti) = 13 kg;
 1 **cesto** (for chile peppers at Luis Calvo, Monteagudi, Tarabuco and Zudañez) = 11.5 kg;
 1 **chipa** (for chile peppers at Camargo) = 11.5 kg.

For grain at Zudanez

			Metric
fanega			92 kg
$1\frac{59}{125}$	tercio		62.5 kg
$3\frac{11}{27}$	$2\frac{17}{54}$	cuartilla	27 kg

65.9 Cochabamba

65.9.1 Units of Length

- 1 **lazo** (at Arani) = 6.10 m;
 1 **brazada** (at Arani and Totora) = 1.69 m.

At Arque

		Metric
carma		6.4 m
$3\frac{13}{17}$	brazada	1.7 m

At Quillacollo

			Metric
lazo			15 m
9 $\frac{3}{8}$	brazada		1.60 m

65.9.2 Units of Area

At Aiquile and Capinota

			Metric
fanegada			28,978 m ²
8	arroba		3622.25 m ²
36	4 $\frac{1}{2}$	almud	804.94 m ²

At Arani

			Metric
fanegada			28,978 m ²
3409 $\frac{3}{17}$	chalamanaca		8.5 m ²

At Arque

							Metric
fanegada							20,976 m ²
—	arroba						3622 m ²
—	—	almud					905.50 m ²
—	—	—	fanegada				320 m ²
—	—	—	3 $\frac{1}{5}$	olla			100 m ²
—	—	—	—	1 $\frac{1}{4}$	wuichila		80 m ²
582 $\frac{2}{3}$	—	—	—	2 $\frac{1}{2}$	2 $\frac{1}{2}$	chaca	36 m ²

At Cliza, Cochabamba, Punta, and Villa Viscarra

				Metric
fanegada				28 976 m ²
8	arroba			3 622 m ²
32	4	almud		905.50 m ²
411	51 $\frac{3}{8}$	12 $\frac{27}{32}$	tarea	70.05 m ²

At Quillacollo

				Metric
fanegada				28 978.2 m ²
2	carga			14 489.1 m ²
8	4	arroba		3 622.27 m ²
36	18	4 $\frac{1}{2}$	almud	804.95 m ²

At Sacaba

				Metric
fanegada				28,976.64 m ²
8	arroba			3622.08 m ²
25 $\frac{3}{5}$		cato		1128.96 m ²
410 $\frac{2}{3}$	51 $\frac{1}{3}$	16	tarea	70.56 m ²

At Tarata

			Metric
fanegada			28 976 m ²
32	almud		905.5 m ²

65.9.3 Units of Dry Capacity1 **viche** (for wheat at Arque) = 20 L;1 **viche** (for grain at Arani) = 16.56 L;1 **viche** (for maize at Arque) = 16 L.**65.9.4 Units of Liquid Capacity**1 **tupo** (at Aiquile) = 26.25 L;1 **arroba** (for wine at Quillacollo) = 26 L;1 **arroba** (for singanis, the Bolivian pisco, at Totora) = 12 L;1 **damajuana** (for wine at Arque) = 10 L;1 **cucha** (for chicha at Villa Viscarra) = 9 L;1 **jarra** (at Independencia) = 4.5 L;1 **cuartilla** (for chicha at Arani) = 4 L;1 **cuartilla** (for chicha at Quillacollo) = 3.37 L;1 **malcriado** (for chicha at Capinota) = 1.5 L;1 **media cuarta** (at Capinota) = 1.5 L;1 **botella** (for chicha at Ayopaya and Taranta) = 660 mL;1 **botella** (for beer at Totora) = 660 mL;1 **botella** (for chicha at Chapare) = 500 mL;1 **cuarta** (for alcoholic beverages at Totora) = 500 mL;1 **el doble** (for chicha at El Doble) = 250 mL.

At Arani

			Metric
cuchu			5 L
3 $\frac{1}{3}$	jarra		1.5 L

For chicha at Arque

					Metric
birque					166 L
2	cantaro				83 L
–	–	lata or tinejo			24 L
–	–	3%	cuartilla		6.75 L
27%	–	4	–	cuchera	6 L

At Cliza

				Metric
tupo				18.75 L
5	cuartilla			3.75 L
10	2	sextilla		1.87 L

At Punata

				Metric
lata				24 L
4		cuartilla		6 L

At Quillacollo

				Metric
lata				24 L
4		jarra		6 L

At Sacaba

				Metric
tupo				12 L
8		cuartilla or jarra		1.5 L

At Tarata

				Metric
tupo				24 L
4		cuartilla		6 L

65.9.5 Units of Weight

1 **fanega** (for wheat at Independencia) = 276 kg;
 1 **fanega** (for maize at Independencia and Sacaba) = 230 kg;
 1 **fanega** (for grain at Totora) = 230 kg;
 1 **fanega** (for barley at Independencia) = 184 kg;
 1 **fanega** (for wheat at Arque and Mizque) = 184 kg;

1 **fanega** (for maize and wheat at Villa Viscarra) = 184 kg;

1 **fanega** (for wheat at Capinota) = 167 kg;

1 **fanega** (for wheat at Punata) = 165.50 kg;

1 **fanega** (for maize at Arque and Punata) = 161 kg;

1 **fanega** (for wheat at Cliza) = 161 kg;

1 **fanega** (for wheat and barley at Tarata) = 161 kg;

1 **carga** (for wheat at Arque) = 160 kg;

1 **fanega** (for maize at Capinota) = 147.20 kg;

1 **fanega** (for barley at Arque) = 138 kg;

1 **fanega** (for maize at Cliza and Tarata) = 138 kg;

1 **fanega** (for maize and flour at Mizque) = 138 kg;

1 **fanega** (for barley at Cliza) = 130 kg;

1 **fanega** (for barley at Capinota) = 126.50 kg;

1 **carga** (for potatoes at Totora) = 115 kg;

1 **fanega** (for wheat at Sacaba) = 110.40 kg;

1 **pesada** (for muko at Aiquile) = 104 kg;

1 **carga** (for grain at Sacaba) = 101.5 kg;

1 **tupo** (for potatoes at Tarata) = 100.64 kg;

1 **carga** (for potatoes at Arque, Cliza, Cochabamba and Mizque) = 100.28 kg;

1 **fanega** (for potatoes at Punata) = 100.28 kg;

1 **pesada** (for ocas and potatoes at Capinota) = 100.28 kg;

1 **pesada** (for potatoes at Tarata) = 100.28 kg;

1 **carga** (for ocas at Mizque) = 100.28 kg;

1 **carga** (for papas at Punata) = 100.28 kg;

1 **tupo** (for grain at Mizque) = 100.28 kg;

1 **carga** (for ocas at Cliza and Quillacollo) = 100 kg;

1 **carga** (for potatoes at Quillacollo and Sacaba) = 100 kg;

1 **fanega** (for grain at Quillacollo) = 100 kg;

1 **tupo** (for grain at Arani and Punata) = 100 kg;

1 **tupo** (for potatoes at Aiquile) = 92 kg;

- 1 **fanega** (for wheat at Cochabamba) = 96 kg;
 1 **carga** (at Tarata) = 82.93 kg (for wheat),
 71.4 kg (for maize) and 66.32 kg (for grain);
 1 **carga** (for maize at Arque) = 64 kg;
 1 **carga** (at Aiquile) = 92 kg (for ocas and
 potatoes) and 57.5 kg (for grain);
 1 **pesada** (for grain at Mizque) = 59.8 kg;
 1 **arroba** (for grain at Totora) = 57.5 kg;
 1 **carga** (for coca at Sacaba) = 57.5 kg;
 1 **pesada** (for maize at Aiquile) = 57.5 kg;
 1 **carga** (for grain at Arani) = 55.2 kg;
 1 **tupo** (for legumes at Quillacollo) = 50 kg;
 1 **pesada** (for flour at Aiquile) = 46 kg;
 1 **verza** (for barley at Aiquile) = 46 kg;
 1 **carga** (for ocas at Cochabamba) = 30 kg;
 1 **viche** (for peanuts and barley at Capinota) =
 27 kg;
 1 **chico** (for legumes at Quillacollo) = 25 kg;
 1 **viche** (for sweet potatoes at Capinota) = 24.84 kg;
 1 **arroba** (for chuño at Cliza, Punata and Sacaba)
 = 23 kg;
 1 **arroba** (for grain at Quillacollo) = 23 kg;
 1 **viche** (for tunta at Cliza) = 23 kg;
 1 **viche** (for chuño at Sacaba) = 23 kg;
 1 **viche** (for potatoes at Sacaba) = 20.24 kg;
 1 **wuichila** (for peas at Arque) = 20 kg;
 1 **arroba** (for corn flour at Sacaba) = 19.32 kg;
 1 **arroba** (for green peas at Cliza) = 18.5 kg;
 1 **arroba** (for grain at Tarata) = 18.4 kg;
 1 **viche** (for habas at Cliza) = 18.4 kg;
 1 **viche** (for quinoa at Sacaba) = 18.4 kg;
 1 **chaca** (for barley at Arque) = 18 kg;
 1 **viche** (for maize at Tarata) = 17.02 kg;
 1 **arroba** (for muko at Sacaba) = 16.56 kg;
 1 **viche** (for flour and maize at Cliza) = 16.56 kg;
 1 **viche** (for barley at Sacaba) = 16.56 kg;
 1 **arroba** (for flour at Cliza) = 16.5 kg;
 1 **viche** (for grain at Cochabamba) = 16 kg;
 1 **arroba** (for grain at Punata) = 14.72 kg;
 1 **arroba** (for peas at Cliza) = 14 kg;
 1 **arroba** (for chuño at Arque) = 13.8 kg;
 1 **almud** (for grain at Tarata) = 7.36 kg;
 1 **rumis** (for flour at Arani) = 500 g.

For grain at Villa Viscarra

			Metric
olla			92 kg
1%	carga		82.8 kg
4%	4/50	viche	20 kg

65.10 La Paz

65.10.1 Units of Length

- 1 **lazo** (at Sicasica) = 11 m;
 1 **pfala** (at Achacachi) = 5.04 m;
 1 **loka** (at Coroico) = 3.36 m;
 1 **loka** (at Coripata) = 3 m;
 1 **brazada** (at Chulumani) = 2.0 m;
 1 **loka** (at Pucarani) = 1.85 m;
 1 **brazada** (at Omasuyos) = 1.69 m;
 1 **brazada** (at Apolo, Inquisivi and Viacha) =
 1.50 m.

65.10.2 Units of Area

- 1 **sayaña** (at Sorata) = 30,000 m²;
 1 **tarea** (at Coripata and Viacha) = 4354.56 m²;
 1 **fanegada** (at Inquisivi and Viacha) = 3500 m²;
 1 **arroba** or **carga** (at Inquisivi) = 3500 m²;
 1 **cato** (for coffee plantations at Coroico) = 2100
 m²;
 1 **cato** (for coca farms at Coroico) = 1935.36 m²;
 1 **tablón** (at Pacajes) = 1800 m²;
 1 **cato** (for coca farms at Irupana) = 1626 m²;
 1 **cato** (at Coripata) = 1 088.64 m²;
 1 **tablón** (for coca plantations at Apolo) = 100 m²;
 1 **eka** (at La Paz) = 15 m²;
 1 **loka** (at Achacachi) = 2 media loka = 3.36 m²;
 1 **brazada** (at Viacha) = 1.75 m²;
 1 **media loka** (at Achacachi) = 1.68 m²;
 1 **paya chellke** (at Pucarani) = 1.2 m².

65.10.3 Units of Liquid Capacity

- 1 **quintal** (at Quime) = 48 L;
 1 **lata** (for alcohol at Caupolicán) = 21.78 L;
 1 **cantaro** (for warapo at Chulumani) = 16 L;
 1 **arroba** (at Palca) = 13.5 L;
 1 **arroba** (at Coroico, Pucarani, Quime and
 Sorata) = 12 L;
 1 **arroba** (at Inquisivi) = 11.5 L;
 1 **jarra** (for chicha at Viacha) = 6 L;
 1 **chacuro** (at Omasuyos) = 4 L;
 1 **cuchu** (at Inquisivi) = 3.5 L;
 1 **cuartilla** (at Pelechuco) = 3.30 L;

- 1 **botella** (for milk and kerosene at Viacha) = 750 mL;
 1 **botella** (for milk at Chulumani) = 700 mL;
 1 **botella** (for milk at Manco Kapac and Omasuyos) = 660 mL.

At Apolo

			Metric
quintal			60 L
4	arroba		15 L
16	4	cuartilla	3.75 L

At Coripata

			Metric
cucha			5.28 L
8		botella	660 mL

At Luribay

			Metric
quintal			48 L
4	arroba		12 L
16	4	cucha	3 L

65.10.4 Units of Weight

- 1 **fanega** (for grain at Quime) = 164.22 kg;
 1 **aym** or **cajón** (for potatoes and similar commodities) = 138 kg;
 1 **fanega** (for flour at Luribay) = 119.60 kg;
 1 **carga** (at Sorata) = 95.68 kg (for wheat), 61.8 kg (for grain) and 46 kg (for chuño);
 1 **carga** (at Inquisivi) = 94.3 kg (for ocas and potatoes) and 87.4 kg (for maize);
 1 **fanega** (for grain at Corocoro) = 92 kg;
 1 **carga** (for firewood at Coroico) = 73.6 kg;
 1 **carga** (at Pucarani) = 72.6 kg (for potatoes), 55.5 kg (for grain) and 35.88 kg (for tunta);
 1 **carga** (for potatoes at Achicachi, Coroico, Corocoro, Luribay, Palca, Puerto Acosta, Quime, Sicasica, Sorata and Viacha) = 71.76 kg;
 1 **carga** (for ocas at Quime) = 71.76 kg;
 1 **carga** (at Pacajes) = 70.75 kg (for potatoes) and 58.97 kg (for chuño);
 1 **carga** (for grain at Apolo and Quime) = 69 kg;
 1 **carga** (for maize at Pelechuco) = 69 kg;
 1 **carga** (for grain at Achicachi) = 59.8 kg;
 1 **carga** (for chuño at Corocoro, Puerto Acosta and Viacha) = 59.8 kg;
 1 **carga** (for chuño and grain at Luribay) = 59.8 kg;
 1 **tupo** (for grain at Achacachi) = 59.8 kg;
 1 **carga** (for grain at Sicasica) = 57.5 kg;
 1 **quintal** (for coca at Coroico) = 55.22 kg;
 1 **carga** (for chuño at Quime) = 55.2 kg;
 1 **tercio** (for grain at Apolo) = 54.75 kg;
 1 **carga** (for ocas at Omasuyos) = 50 kg;
 1 **pituca** (for beans at Quillacollo) = 50 kg;
 1 **carga** (for ocas at Viacha) = 46 kg;
 1 **brazada** (for cebada berza at Luribay) = 46 kg;
 1 **tiro de lazo** (for cebada berza at Quime and Sicasica) = 46 kg;
 1 **costal** (for fertilizer at Omasuyos) = 34 kg;
 1 **tambor** (for coca at Chulumani) = 27.6 kg;
 1 **tambor** (for coca at Coripata and Coroico) = 23 kg;
 1 **cuartilla** (for grain at Quime) = 17.90 kg;
 1 **cesto** (for coca at Coripata) = 14.75 kg;
 1 **arroba** (for coffee and cassava at Coripata) = 14.72 kg;
 1 **cesto** (for coca at Chulmani) = 14.72 kg;
 1 **cesto** (for coca at Chulmani and Coroico) = 13.8 kg;
 1 **arroba** (for coffee at Chulumani) = 13.8 kg;
 1 **arroba** (for tubers and grains at Viacha) = 11.6 kg;
 1 **arroba** (for potatoes and chuño at Pacajes) = 11.34 kg;
 1 **arroba** (for walusa and cassava at Chulimani) = 11.5 kg;
 1 **chipa** (for onions at Achacachi) = 10.7 kg;
 1 **cesto** (for coca at Caupicán) = 10.12 kg;
 1 **costal** (for charcoal at Coroico) = 10.12 kg;
 1 **collo** (for beans at Pelechuco) = 5.75 kg;
 1 **collo** (for peanuts at Apolo) = 5.53 kg;
 1 **kcupmo** (for coca at Caupolicán) = 2.76 kg;
 1 **tanca** (for maize and rice at Caupolicán) = 2.76 kg;
 1 **huarco** (for coca at Chulumani, Coripata and Coroico) = 1.84 kg;
 1 **sillko** (for coca at Caupolicán, present Franz Tamayo) = 1.15 kg.

65.11 Oruro

65.11.1 Units of Length

1 **tupo** (at Corque) = 5 000 m;

1 **brazada** (at Huanané and Salinas de Garci Mendoza) = 1.68 m.

At Ancacatu

			Metric
soga			8.4 m
5	brazada		1.68 m

At Huanuni

			Metric
tupo			7000 m
77%	manzano		90 m
233⅓	3	pasaje	30 m

65.11.2 Units of Area

1 **arroba** (at Challapata) = 50 m²;

1 **sayaña** (at Corque) = 50 m².

At Huanuni

					Metric
sayaña					1200 m ²
4 ^{11/16}	fanegada				256 m ²
7½	1⅔	carga			160 m ²
12	2 ^{4/25}	1⅔	Manzano		100 m ²
37½	8	5	3⅔	arroba	32 m ²

At Salinas de Garci Mendoza

					Metric
cuartilla					2000 m ²
4	cajón				500 m ²
25 ^{15/47}	6 ^{1/94}	tarea			78.96 m ²
1190	297½	47	brazada		1.68 m ²
2380	595	94	2	cordelada	84 dm ²

65.11.3 Units of Liquid Capacity

1 **odre** (at Betanzos) = 50 L;

1 **botella** (at Salinas de Garci Mendoza) = 750 mL.

At Challapata

			Metric
quintal			48 L
4	arroba		12 L
64	16	botella	750 mL

At Huanuni

					Metric
quintal ^a					30 L
—	odre ^b				17.25 L
2	—	odre ^c			15 L
2½	—	1¼	arroba or huanta		12 L
10	5¾	5	4	cuartilla	3 L

^aFor pisco

^bFor honey

^cFor wine

For chicha at Huanuni

				Metric
puño				72 L
1⅓	cuarta			45 L
2½	1 ^{27/48}	huanta		28.8 L
36	22½	14⅔	chico	2 L

At Oruro

			Metric
quintal			48 L
2⅔	lata ^a		18 L
4	1½	arroba	12 L

^aUsually used for alcoholic beverages

For chicha at Oruro

				Metric
lata				18 L
2¼	medio burro			8 L
6	2⅔	cuartilla		3 L
9	4	1½	chico	2 L

At Poopó

			Metric
quintal			48 L
4	arroba		12 L
16	4	cuartilla	3 L

65.11.4 Units of Weight

- 1 **carga** (at Huanuni) = 184 kg (for barley) and 73.6 kg (for potatoes);
 1 **carga** (for potatoes at Oruro) = 100.28 kg;
 1 **pesada** (for potatoes and papalizas (naturally-dehydrated potatoes) at Huanuni) = 96.6 kg;
 1 **carga** (at Valle Grande) = 92 kg (for potatoes), 77.28 kg (for maize) and 69 kg (for fruit);
 1 **pesada** (for chuño at Challapata) = 64.4 kg;
 1 **carga** (for grain at Quirusillas) = 57.5 kg;
 1 **quintal** (for ocas at Huanuni) = 57.5 kg;
 1 **carga** (for potatoes at Poopo and Salinas de Garci Mendoza) = 52.9 kg;
 1 **pesada** (for potatoes at Challapata) = 52.9 kg;
 1 **carga** (at Salinas de Garci Mendoza) = 50.6 kg (for chuño), 48.3 kg (for flour) and 46 kg (for quinoa);
 1 **pesada** (for maize at Challapata) = 48.3 kg;
 1 **quintal** (for chuño (freeze.dried potatoes) at Huanuni) = 48.3 kg;
 1 **tupo** (for potatoes at Huanuni) = 46 kg;
 1 **arroba** (for wheat at Huanuni) = 25.3 kg;
 1 **fardo** (for firewood at Huanuni) = 25.30 kg;
 1 **chipa** (for charcoal at Huanuni and Sajama) = 11.5 kg;
 1 **cesto** (for chile peppers at Huanuni) = 14.72 kg;
 1 **arroba** (for chuño at Sajama) = 11.6 kg.

For potatoes at Corque

		Metric
carga		46 kg
2	carguilla	23 kg

65.12 Pando

65.12.1 Units of Area

At Las Pedras

		Metric
almud		10,000 m ²
10	tarea	1000 m ²

65.12.2 Units of Weight

- 1 **chipa** (for dried meat at Las Piedras) = 57.5 kg;
 1 **chipata** (for cheese at Las Piedras) = 46 kg;
 1 **panero** (for flour at Las Piedras) = 46 kg;
 1 **pasaye** (for rice at Las Piedras) = 34.5 kg;
 1 **caja** (for chestnuts at Las Piedras) = 23 kg;
 1 **panacu** (for yuca at Las Piedras) = 13.8 kg;
 1 **mazo** (for tobacco at Las Piedras and Porvenir) = 1 kg.

65.13 Potosi

65.13.1 Units of Length

- 1 **cordelada** (at Llica) = 10.5 m;
 1 **lazo** (at Uyuni) = 10.08 m;
 1 **lazo** (at Sacaca) = 9.40 m;
 1 **lazo** (at Betanzos) = 5 m;
 1 **brazada** (at Tomave) = 1.70 m;
 1 **brazada** (at Surumi) = 1.65 m;
 1 **brazada** (at Sacaca) = 1.62 m;
 1 **brazada** (at Puna) = 1.60 m;
 1 **brazada** (at Tinguipaya) = 1.50 m;
 1 **paso** (at Sacaca) = 1 m;

65.13.2 Units of Area

- 1 **fanegada** (in Tupiza) = 28,976 m²;
 1 **olla** (at Tupiza) = 4.898 m² or 4 115 m²;
 1 **olla** (at San Pedro B.) = 3.500 m²;
 1 **almud** (at Puna) = 1000 m².

At Arampampa

			Metric
fanegada			28,976 m ²
8	viche		3622 m ²
32	4	almud	905.5 m ²

At Colquechaca

			Metric
castilla			33,725 m ²
2	huayta		16,862.5 m ²
9½	4¾	olla	3550 m ²

At Cotagaita

			Metric
carga			16,000 m ²
4	olla		4000 m ²
16	4	almud	1000 m ²

At Potosí, Uncía and Uyuni

				Metric
fanegada				28,976 m ²
8	viche ^a			3622 m ²
32	4	almud		905.5 m ²
414	51¾	12 ^{30/32}	tarea	69.99 m ²

^aAt Uncía and Uyuni also reported as 3625 m²

At Sacaca

			Metric
viche			3625 m ²
72½		arroba	50 m ²

65.13.3 Units of Liquid Capacity

- 1 **quintal** (at Tarapaya) = 48.84 L;
 1 **quintal** (at Pulaxi) = 47.52 L;
 1 **botija** (for wine at Cotagaita) = 30.66 L;
 1 **phisu puñu** (for chicha at Potosi) = 30 L;
 1 **santico** (at San Pedro) = 26 L;
 1 **garrafon** (at Las Piedras) = 23 L;
 1 **lata** (for chicha at Uncía) = 20 L;
 1 **barril** (for chicha at Sacaca) = 16 L;
 1 **arroba** (at San Pedro) = 15.3 L;
 1 **garrafon** (at Totora) = 15.18 L (for chicha) and 1.80 L (for other liquids);
 1 **arroba** (at Colquechaca, and Uyuni) = 13.5 L;
 1 **arroba** (at Arampampa) = 12 L;
 1 **cuartilla** (at Otuyo) = 12 L;
 1 **cuartilla** (at Millares) = 4 L;
 1 **cuartilla** (at Ocurí) = 3.8 L;
 1 **cuartilla** (at Colquechaca, and Potosi) = 3.37 L;
 1 **cuartilla** (at Tumusla) = 3.2 L;

- 1 **cuartilla** (at Vitichi) = 3 L;
 1 **botella** (at Colquechaca) = 750 mL;
 1 **botella** (at Uncía) = 660 mL.

For chichi at Arampampa

		Metric
tinaja		11.25 L
5	jarra	2.25 L

At Betanzos, Colagaita, and Uncia

			Metric
quintal			54 L
4	arroba		13.5 L
16	4	Cuartilla	3.37 L

At Potosi

		Metric
chivo		61.33 L
4	arroba	15.3 L

At Puna

					Metric
quintal					49 L
4 ^{1/12}	arroba				12 L
8 ^{1/6}	2	cuartilla			6 L
17½	4 ^{3/7}	2 ^{2/7}	yuro		2.8 L
49	12	6	2 ^{4/5}	botella	1 L

At Sacaca

			Metric
lata			16 L
1 ^{3/13}	arroba		13 L
5 ^{1/3}	4 ^{1/3}	Cuartilla	3 L

For chichi at Uyuni

		Metric
huanta		150 L
150	jarra	1 L

At Vilacaya

			Metric
quintal			46 L
4	arroba		11.5 L
8	2	Cuartilla	5.75 L

65.13.4 Units of Weight

- 1 **castilla** (for grain at Colquechaca) = 110.4 kg;
 1 **carga** (at Arampampa) = 102.1 kg (for maize), 100 kg (for potatoes), 85.1 kg (for wheat) and 60.95 kg (for barley);
 1 **pesada** (for potatoes at Arampampa) = 100.2 kg;
 1 **carga** (for ocas and potatoes at Sacaca) = 100 kg;
 1 **pesada** (for potatoes at Sacaca) = 100 kg;
 1 **pesada** (for potatoes at Colquechaca) = 78.2 kg;
 1 **carga** (at Colquechaca) = 73.6 kg (for potatoes) and 55.2 kg (for chuño and maize);
 1 **carga** (for maize at Tumusla) = 70 kg;
 1 **carga** (for ocas and potatoes at Uncia) = 69 kg;
 1 **carga** (for wheat at Tacobamba) = 68 kg;
 1 **carga** (for ocas and potatoes at Tupiza) = 64.4 kg;
 1 **tercio** (for grain at Puna) = 63 kg;
 1 **carga** (for grain at Cotagaita) = 62.1 kg;
 1 **carga** (at Villa Betanzos) = 62.1 kg (for barley) and 50.6 kg (for maize);
 1 **tercio** (for maize at Betanzos) = 62.1 kg;
 1 **quintal** (for grain at San Pedro) = 60.1 kg;
 1 **carga** (for ocas and potatoes at San Pedro) = 60 kg;
 1 **carga** (for wheat at Toropalca) = 59.8 kg;
 1 **carga** (for maize at Tuctapari) = 59.8 kg;
 1 **carga** (for maize at Vitichi) = 57.5 kg;
 1 **huayta** (for grain at Colquechaca) = 55.20 kg;
 1 **quintal** (for flour and muko at Villa Betanzo) = 50.06 kg;
 1 **carga** (for grain and potatoes at Puna) = 50 kg;
 1 **pesada** (for potatoes at Uyuni) = 49.68 kg;
 1 **carga** (for potatoes at Potosi) = 46 kg;
 1 **chipa** (for charcoal at Betanzos) = 23 kg;
 1 **viche** (for beans and chuño at Sacaca) = 23 kg;
 1 **viche** (for maize at Uyuni) = 23 kg;
 1 **arroba** (for grain at Arampampa) = 17.02 kg;
 1 **viche** (at Arampampa) = 17.02 kg;
 1 **cuartilla** (for grain at Tupiza) = 16.10 kg;
 1 **olla** (for flour and muko at San Pedro) = 16 kg;
 1 **arroba** (for chuño at San Pedro) = 15 kg;
 1 **pactamanca** (for maize at Uyani) = 12.5 kg;
 1 **canasto** (at Potosi) = 12 kg (for beans) and 10 kg (for fruit);
 1 **cesto** (for chile peppers at Uncía and Vitichi) = 11.5 kg;
 1 **olla** (for grain at Colquechaca) = 11.5 kg;
 1 **cesto** (for chile peppers at Quechisla) = 11.04 kg;

- 1 **cesto** (for chile peppers at San Pablo) = 9.2 kg;
 1 **brazada** (for onions at Potosi) = 8 kg;
 1 **chajclamanca** (for maize at Uyuni) = 6.25 kg;
 1 **almud** (for grain at Arampampa) = 4.14 kg;
 1 **almud** (for grain at Sacaca) = 2 kg.

65.14 Santa Cruz

65.14.1 Units of Length

- 1 **lazo** (at Montero) = 12 m;
 1 **brazada** (at Santa Cruz) = 1.68 m;
 1 **brazada** (at Vallagrande) = 1.50 m.

65.14.2 Units of Area

- 1 **tarea** (at Buena Vista, Puerto Suárez and Warnes) = 1000 m²;
 1 **almud** (at Lagunillas) = 905.50 m²;
 1 **manzano** or **tarea** (at Vallegrande) = 150 m²;
 1 **tarea** (at Lagunillas) = 70.56 m².

At Montero

			Metric
almud			1000 m ²
10	tarea		100 m ²
100	10	huascada	10 m ²

At San José; at Portachuelo and Santa Cruz

		Metric	Metric
almud		7056 m ²	8400 m ²
10	tarea	705.6 m ²	840 m ²

65.14.3 Units of Liquid Capacity

- 1 **botija** (at Warnes) = 56 L;
 1 **botija** (at Buena Vista) = 27 L;
 1 **chipeno** (for molasses at Santa Cruz) = 20 L;
 1 **lata** (for alcohol at Camiri) = 16 L;
 1 **arroba** (at Quirusillas) = 15 L;
 1 **arroba** (at Samipata) = 12 L;
 1 **cuartilla** (at Buena Vista) = 6.75 L;
 1 **jarra** (at Santa Cruz) = 5 L;
 1 **botella** (at Camiri, Charagua, and Puerto Suárez) = 750 mL;
 1 **botella** (at Guarayos) = 660 mL.

At Laquillas

				Metric
arroba				12 L
1 $\frac{3}{5}$	jarra			7.5 L
3 $\frac{3}{5}$	2	cuartilla		3.75 L
16	10	5	botella	750 mL

At Montero

				Metric
botija^a				102 L
3%	botija			27 L
15%	4	cuartilla		6.75 L
115 ^{10/11}			botella	880 mL

^aFor molasses

At Vallegrande

				Metric
barril^a				30 L
1 $\frac{1}{4}$	barril^b			24 L
2 $\frac{1}{2}$	2	arroba		12 L
4	3 $\frac{3}{5}$	1 $\frac{3}{5}$	jarra	7.5 L
			vaso^c	250 mL

^aFor singanis^bFor wine^cFor milk

65.14.4 Units of Weight

1 **pirgua** (for rice before milling at San José) = 2875 kg;

1 **carretada** (for cane and sugar at Guarayos) = 575 kg;

1 **trinchera** (for maize at San José) = 575 kg;

1 **panacu** (for corn husks at Santa Cruz) = 161 kg;

1 **carguilla** (for grain at Quirusillas) = 57.5 kg;

1 **costal** (for legumes at Quirusillas) = 46 kg;

1 **tercio** (for chancaca (a form of unrefined sugar) at Vallegrande) = 34 kg;

1 **jacé** (for sugar cane at San José) = 25 kg;

1 **costal** (for onions at Quirusillas) = 23 kg;

1 **cajón** (for fruit at Vallegrande) = 23 kg;

1 **jasayé** (for yucca at San José) = 23 kg;

1 **arroba** (for general use at Montero) = 21.5 kg;

1 **tupé** (for yucca at Guarayos) = 17.25 kg;

1 **almud** (for maize at Montero) = 16.10 kg;

1 **almud** (for grain at Buena Vista) = 14.72 kg;

1 **almud** (for rice at Montero, Portachuelo and Warnes) = 14.72 kg;

1 **almud** (for grain at Santa Cruz) = 13.80 kg;

1 **arroba** (for grain at Charagua, Guarayos, Lagunillas and Warnes) = 11.5 kg;

1 **paugé** (for maize on the cob at San José) = 4 kg;

1 **mazo** (for tobacco at San José) = 1 kg;

65.15 Tarija

65.15.1 Units of Length

At Tarija

		Metric
cordelada		20 m
1 $\frac{1}{3}$	lazo	15 m

65.15.2 Units of Area

At Padcaya

				Metric
carga				420 m ²
4 $\frac{2}{3}$	olla			100 m ²
294	70	arroba		70 m ²
2058	10	7	tumina or yuro	10 m ²

At Pampa Redon

			Metric
fanegada			41,784 m ²
4		olla	10,446 m ²

At Tarija

				Metric
fanegada				29,262 m ²
4	olla			7313 m ²
16	4	tumina		1828 m ²
64	16	4	yuro	457 m ²

Other reported measures:

1 **fanegada** (in San Lorenzo) = 29,262 m²;

1 **fanegada** (in Concepción) = 28,976 m²;

1 **almud** (at San Lorenzo) = 967.68 m²;

1 **almud** (at Concepción) = 100 m²;

1 **olla** (at San Lorenzo) = 100 m².

65.15.3 Units of Liquid Capacity

At Tarija

				Metric
quintal				54 L
$1\frac{1}{55}$	odre			41.25 L
$7\frac{1}{5}$	$5\frac{1}{2}$	cuartilla		7.50 L
$14\frac{2}{5}$	11	2	yambuy	3.75 L

Other reported measures:

- 1 **cantaro** (for chicha at Tarija) = 162 L;
- 1 **cantaro** (for chicha at San Lorenzo) = 72 L;
- 1 **botija** (for wine at Tarija) = 41.25 L;
- 1 **botija** (at Concepción, Padcaya and San Lorenzo) = 30 L;
- 1 **botija** (for singanis at Tarija) = 30 L;
- 1 **barril** (for wine at Entre Rios) = 25 L;
- 1 **arroba** (at San Lorenzo) = 15 L;
- 1 **arroba** (at Entre Rios) = 13.5 L (for general use) and 11.25 L (for honey);
- 1 **cuartilla** (at San Lorenzo) = 5.75 L;
- 1 **cuartilla** (for wine at Tarija) = 3.75 L;
- 1 **cuartilla** (at Concepción and Padcaya) = 3.37 L;
- 1 **cuartilla** (at Pampa Redond) = 3.33 L;
- 1 **isiri** (for chicha at Tarija) = 1.12 L;
- 1 **jarra** (for chicha at Entre Rios) = 1 L;
- 1 **botella** (at Concepción) = 750 mL;
- 1 **botella** (at Gran Chaco) = 660 mL.

65.15.4 Units of Weight

For tobacco at Entre Rios

		Metric
andullo		23 kg
92	manajo	250 g

For grain at Padcaya

				Metric
olla				16.56 kg
$1\frac{1}{25}$	arroba			11.5 kg
2	$1\frac{1}{18}$	tumina		8.28 kg
8	$5\frac{1}{9}$	4	yuro	2.07 kg

For grain at Tarija

				Metric
retazo				26.22 kg
$1\frac{3}{25}$	olla			17.25 kg
$6\frac{7}{25}$	4	tumina		4.31 kg
$9\frac{1}{2}$	$6\frac{1}{4}$	$1\frac{1}{16}$	cuartilla	2.76 kg

Other reported measures:

- 1 **carga** (for potatoes at Entre Rios, Padcaya, Pampa Redondo, San Lorenzo and Tarija) = 92 kg;
- 1 **carga** (for papaliza at Pampa Redondo) = 92 kg;
- 1 **carga** (at Concepción) = 92 kg (for ocas and potatoes), 69 kg (for flour and maize) and 46 kg (for firewood);
- 1 **carga** (for maize and ocas at Padcaya, Pampa Redondo and San Lorenzo) = 69 kg;
- 1 **chipa** (for chile peppers at San Lorenzo) = 69 kg;
- 1 **carga** (for barley and maize at Tarija) = 69 kg;
- 1 **carga** (for grain at Yacuiba) = 69 kg;
- 1 **yuro** (for maize at Tarija) = 17.2 kg;
- 1 **arroba** (for beans, garbanzos, and grain at Concepción) = 11.5 kg;
- 1 **arroba** (for grain at San Lorenzo) = 11.5 kg;
- 1 **arroba** (for ocas at San Lorenzo) = 11.5 kg;
- 1 **chipa** (for chile peppers at Entre Rios and Pampa Redonda) = 11.5 kg;
- 1 **piquera** (for tomatoes at San Lorenzo) = 11.5 kg;
- 1 **chipa** (for chile peppers at Yacuiba) = 11 kg.

66 Bonin Islands

In 1862, this area was incorporated into the Empire of Japan. After the Second World War, the islands were occupied by the United States, which administered the islands until 1968, when they were returned to Japan.

The U.S. customary system is still used.

66.1 Currency

- 1 US dollar = 100 cents

67 Kingdom of Bonny [Formerly: Ubani Kingdom]

See also *Nigeria*.

Main source: [RUGG]

67.1 Units of Length

1 **covado** = 577.5 mm.

67.2 Units of Liquid Capacity

1 **puncheon** (for palm oil) = 318.226 432 L.

1992–1998: 1 Republica Srpska dinar = 100 para
 1944–1992: 1 Yugoslav dinar = 100 para
 1941–1943: 1 Croatian kuna = 100 banica
 1919–1941: 1 Serbian dinar = 100 para
 1878–1919: 1 Austrian krone = 100 heller
 –1878: 1 lira = 100 Ottoman Empire piastres = 4000 paras

68 Bophuthatswana

See *South Africa*.

The Republic of Bophuthatswana was a Bantustan, consisting of seven widely scattered enclaves, in northwestern South Africa between 1977 and 1994. It was never internationally recognized as a state.

69 Bornu Empire

See also *Cameroon*, *Chad*, *Niger* and *Nigeria*.

This empire was established in 1380. In 1893, Bornu was conquered by an invading army, led by Rabiḥ az-Zubayr ibn Fadl Allah, from eastern Sudan.

70 Bosnia and Herzegovina [Part of the Former Yugoslavia]

See also *Dalmatia* and *Ottoman Empire*.

Part of the Ottoman Empire from 1459, Bosnia-Herzegovina became part of Austria-Hungary in 1878 and part of Yugoslavia in 1929. Independence was declared in 1992.

The Metric system has been compulsory since 1876.

70.1 Currency

1995–: 1 Bosnia-Herzegovina convertible mark = 100 convertible fenings or pfeniga
 1994–1995: 1 new Bosnian dinara = 10,000 Bosnian dinar
 1992–1994: 1 Bosnian dinara = 100 para

71 Botswana [Formerly: Bechuanaland Protectorate]

See also *South Africa*.

In the 1200s, nations began to take shape in the region, among them Bakgalagadi, Batswana and Basotho. This development took place in what became the Transvaal in South Africa, and 300 years later, several groups of people walked north to the current Botswana. At the same time, kingdoms emerged in the current Zimbabwe, which extended into present-day Botswana. The area was united as Bechuanaland in the early nineteenth century. As the Boer threat intensified, appeals for protection were made to the British Government. Bechuanaland became a crown colony of Britain in 1885. In 1895, the southern part of the protectorate was annexed to Cape Province. The northern part, known as the Bechuanaland Protectorate, remained under British administration until it gained its independence, as the Republic of Botswana, in 1966.

Prior to 1969, the same measures as those in South Africa were used officially in trading. The Metric system, as a conversion from the British Imperial system, was introduced in 1969, and became compulsory in 1973. The old systems were discontinued from 1971 onward.

Main sources: [SAOC], [UN66], and [WARD3]

71.1 Currency

1976–: 1 Botswana pula = 100 thebes = 10,000 cents
 1961–1976: 1 South African rand = 100 cents

1920–1961: 1 South African pound = 20 shillings = 240 pence
c. 1885–1920: 1 pound sterling = 20 shillings = 240 pence = 960 farthings

71.2 Units of Length

South African system before 1971

				Metric
Cape rood				3.778 3 m
12	Cape foot			314.858 mm
144	12	Cape inch		26.238 mm

Some other reported measures:

1 lonau = a footlength.

71.3 Units of Area

South African system before 1971

				Metric
Morgen				8565.3 m ²
600	Cape rood ²			14.275 5 m ²
86,400	144	Cape foot ²		9.913 5 dm ²

Some reported measures:

1 Tagwerk = 0.54 ha.

71.4 Units of Dry Capacity

South African system before 1971

						Metric
legger						691.005 L
4¾	mud					145.475 L
19	4	schepel or scheffel				36.368 7 L
152	32	8	gallon			4.546 L
608	128	32	4	quart		1.136 L
1216	256	64	8	2	pint	568.26 mL

71.5 Units of Liquid Capacity

South African system before 1971

				Metric
leaguer				577.034 914 L
5¾	mud or muid			109.045 968 L
127	24	gallon		4.543 582 L

71.6 Units of Weight

South African system before 1971

				Metric
Capeton				907.184 000 kg
10	bag			90.718 400 kg
2000	200	pound		453.592 g

For medical use before 1971

					Metric
pfund					369.125 8 g
12	unze				30.760 48 g
96	8	drachm			3.845 06 g
288	24	3	skrupel		1.281 69 g
5760	480	60	20	gran	64.08 mg

72 Duchy of Bouillon

See also *Belgium* and *France*.

This duchy was a small semi-sovereign state between Luxembourg, Champagne and the Three Bishoprics, which lasted from 1456 until 1795, when it became annexed to France. In 1815, it became part of the Grand Duchy of Luxembourg, and in 1830, it became part of Belgium.

Main source: [TAND2]

72.1 Currency

–1815: 1 live tournois = 20 sols = 80 liards = 240 deniers

72.2 Units of Length

								Metric
piètche								7.146 670 m
1 ¹ / ₁₀	piètche comune							6.496 973 m
3 ² / ₃	3 ¹ / ₃	twaze						1.949 092 m
22	20	6	pîd du Rwa					324.849 mm
24	21 ⁹ / ₁₁	6 ⁹ / ₁₁	1 ¹ / ₁₁	pîd du France				297.778 mm
264	240	72	12	11	pouce			27.071 mm
3168	2880	864	144	132	12	ligne		2.256 mm
31,680	28,800	8640	1440	1320	120	10	pwint	0.256 mm

72.3 Units of Area

				Metric
arpent pou les bwès				5107.500 m ²
100	piètche câréye			51.075 m ²
2200	22	pîd costé		2.322 m ²
48,400	484	22	pîd caré	10.553 dm ²

72.4 Units of Volume

For timber:

- 1 twaze cube = 7.403 9 m³;
- 1 cwâde du grands bwès = 4.387 m³;
- 1 cwâde d'ordonance = 8 × 4 pîds = 3.840 m³;
- 1 cwâde du Paris = 4 × 4 pîds = 1.920 m³;
- 1 pîd cube = 34.280 dm³.

72.5 Units of Dry Capacity

For cereals

					Metric
muid					2304 L
12	setier				192 L
24	2	mine			96 L
48	4	2	minot		48 L
144	12	6	3	bwassâ	16 L

For other dry commodities

		Metric
cartel		39.08 L
2	bichet	19.54 L

72.6 Units of Liquid Capacity

				Metric
pot ^a				1.060 L
12	pinte			88.33 mL
24	2	chopin		44.17 mL
96	8	4	cwarlèt	11.04 mL

^aAt Beaumont, reported as 2.857 L

72.7 Units of Weight

									Metric
mile									489.590 kg
10	quintal								48.959 kg
1000	100	live							489.590 g
2000	200	2	marc						244.795 g
4000	400	4	2	cwatron					122.397 g
16,000	1600	16	8	4	once				30.599 g
128,000	12,800	128	64	32	8	gros			3.825 g
384,000	38,400	384	192	96	24	3	denier		1.275 g
9,216,000	921,600	9216	4608	2304	576	72	24	grin	53.1 mg

73 Bourbon Island

See *Réunion*.

74 Bouvet Island

This is an uninhabited, volcanic Antarctic island that is almost entirely covered by glaciers. It has been a territory of Norway since 1928.

75 Brazil

See also *Portugal*.

Brazil was discovered by Pedro Alvarez Cabral in 1500, organised as a Government General of Portugal in 1548, and proclaimed as a royal colony in 1549. It was a Portuguese Vice-royalty from 1720 until it gained its independence in 1822 as the Empire of Brazil. In 1889, a federal republic was established. Following a coup in 1964, the armed forces retained overall control under a dictatorship. A civil government was restored in 1985 and a new constitution was adopted in 1988.

The traditional system of weights and measures was influenced by the Old Portuguese system and the U.S. customary system. The Metric system was adopted in 1862, and became compulsory in 1874.

Main sources: [HARM], [MART3], [PEIX], [SMIT5], [SCHW2], [UN55], and [UN66]

75.1 Currency

1994–:	1 Brazilian real = 100 centavos
1993–1994:	1 Brazilian cruzeiro real = 100 centavos
1990–1993:	1 Brazilian cruzeiro = 100 centavos
1989–1990:	1 Brazilian cruzado novo = 100 centavos
1986–1989:	1 Brazilian cruzado = 100 centavos
1967–1986:	1 Brazilian cruzeiro novo = 100 centavos
1942–1967:	1 Brazilian cruzeiro = 100 centavos
1833–1942:	1 milréis = 1000 réis
1707–1750:	1 dobra = 12,800 reis
1645–1654:	1 florin = 20 stuivers

75.2 Units of Quantity

1 **cento** = 100.

75.3 Units of Length

Traditional upper scale and as reported in the twentieth century

						Metric	Metric
légua ^a de sesmaria						6576 m	6600 m
3	milha					2192 m	2200 m
3000	1000	braça				2.192 m	2.2 m
3333⅓	1111⅓	1⅓	tolsa			1.972 8 m	–
4000	1333⅓	1⅓	1⅓	passo geométrico		1.644 m	1.65 m
6000	2000	2	1⅓	1½	vara	1.096 m	1.1 m

^aThe **légua** was also reported as 5599.95 m in some areas

Traditional lower scale and as reported in the twentieth century

								Metric	Metric
vara								1.096 m	1.1 m
1⅓	passo ordinário							822 mm	825 mm
1⅓	1¼	côvado^a						657.6 mm	660 mm
3⅓	2½	2	pé					328.7 mm	330 mm
5	3¾	3	1½	palmo^b				219.1 mm	220 mm
40	30	24	12	8	polegada			27.39 mm	27.5 mm
480	360	288	144	96	12	linha		2.28 mm	2.292 mm
4800	3600	2880	1440	960	120	10	ponto	0.228 mm	0.229 mm

^a1 **côvado** was also reported as 25 polegadas = 687.5 mm

^b1 **palmo** was also reported as = 217.4 mm

For maritime use

				Metric
légua marítima^a				5555.55 m
3	milha			1851.85 m
2525¼	841¾	braça		2.2 m
5050½	1 683½	2	vara	1.1 m

Other reported measures:

- 1 **estadio** = 262.748 m;
- 1 **yarda** (for textiles) = 914.392 mm;
- 1 **covado avantejado** (for cloth) = 680.625 mm;
- 1 **covado** (for linen, silk and shoes) = 660.000 mm.

75.4 Units of Area

Traditional system for land areas, based on [SMIT5] and [MART3]

				Metric
alqueire				24,200 m ²
2	alqueire minero			12,100 m ²
5⅓	2⅓	parefa		4356 m ²
5000	2500	900	braça quadrada	4.84 m ²

Upper scale, according to [PEIX] and [SMIT5]

							Metric
quadra de sesmaria^a (60 × 3000 braças)							871,200 m ²
18	alqueire mineiro^b (100 × 100 braças)						48,400 m ²
36	2	alqueire paulista^c (100 × 50 braças)					24,200 m ²
45	2½	1¼	jeira				19,360 m ²
50	2⅞	1⅞	1⅞	quadra gaúcha^d (60 × 60 braças)			17,424 m ²
72	4	2	1⅔	1⅞	quadra paraibana^e (50 × 50 braças)		12,100 m ²
180,000	10,000	5000	4000	3600	2500	braça quadrada	4.84 m ²

^aUsed in the cattle-growing *fronteira* or *campina*^bUsed in Espírito Santo, Goiás, Minas Gerais, and Rio de Janeiro^cUsed in Santa Catarina, São Paulo, Paraná, in the the northern part of Rio Grande do Sul and in the southern part of Mato Grosso^dUsed in the farming districts in Rio Grande do Sul^eUsed in Paraíba

Middle scale, according to [PEIX] and [SMIT5]

						Metric
tarefa bahiana^a (30 × 30 braças)						4356 m ²
1⅓	tarefa cearense^b (30 × 25 braças)					3630 m ²
1⅞	1⅓	tarefa nordestina^c (25 × 25 braças)				3025 m ²
4½	3¾	3⅞	gaúcha^d (10 × 20 braças)			968 m ²
900	750	625	200	braça quadrada		4.84 m ²

^aUsed in Bahia, Ceará, Pernambuco, Goiás, and to some extent in Minas Gerais^bUsed in Ceará^cUsed in Alagôas, Ceará, Paraíba, Pernambuco, and Sergipe. In Rio Grande do Norte, known as 1 **mil covas** (= “1000 hills”)^dUsed in the northeastern portion of Rio Grande do Sul

Lower scale, according to [PEIX] and [SMIT5]

				Metric
braça quadrada				4.84 m ²
4	vara quadrada			1.21 m ²
100	25	palmo quadrada		4.84 dm ²
6400	1600	64	pollegada quadrada	7.56 cm ²

Other measures used during the nineteenth and twentieth centuries:

1 **alqueirão** (in Bahia, Goiás, and Minas Gerais) = 200×200 braças = 440×440 m = 193,600 m²;

1 **alqueire Baiano** or **alqueirão** (in Mato Grosso and Minas Gerais) = 100×200 braças = 220×440 m = 96,800 m²;

1 **alqueire** (in Minas Gerais) = 100×150 braças = 220×330 m = 72,600 m²;

1 **alqueire Mineiro** or **alqueire Geométrico** (in Acre, Bahia, Espírito Santo, Goiás, Mato Grosso, Minas Gerais, Rio de Janeiro, Rio Grande do Norte, Rio Grande do Sul, Santa Catarina, São Paulo, and Tocantins) = 100×100 braças = 220×220 m = 48,400 m²;

1 **alqueire** (in Minas Gerais and Rio de Janeiro) = 75×100 braças = 165×220 m = 33,000 m²;

1 **alqueire** (in Espírito Santo, Minas Gerais, and São Paulo) = 80×80 braças = 176×176 m = 30,976 m²;

1 **alqueire** (in Minas Gerais) = 79×79 braças = $173\frac{1}{2} \times 173\frac{1}{2}$ m = 30,206.44 m²;

1 **alqueire** (in Minas Gerais) = 75×80 braças = 165×175 m = 28,875 m²;

1 **alqueire do Norte** (in all states) = 75×75 braças = 165×165 m = 27,225 m²;

1 **alqueire Paulista** (in Espírito Santo, Goiás, Maranhão, Mato Grosso, Minas Gerais, Pernambuco, Paraíba, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, and São Paulo) = 50×100 braças = 110×220 m = 24,200 m²;

1 **alqueire** (in Mato Grosso and Minas Gerais) = 50×75 braças = 110×165 m = 18,150 m²;

1 **braça de Sesmaria** (in Rio Grande do Sul) = 1×3000 braças = $2\frac{1}{5} \times 6600$ m = 14,520 m²;

1 **alqueire** or **quarta** (in Minas Gerais and São Paulo) = 50×50 braças = 110×110 m = 12,100 m²;

1 **cento de Côvados** or **tarefa Baiana** (in Bahia) = 30×30 braças = 66×66 m = 4356 m²;

1 **cem Passos** (in Ceará) = 30×30 braças = 66×66 m = 4356 m²;

1 **mil covas** or **tarefa** (in all states) = 25×25 braças = 55×55 m = 3025 m²;

1 **celamim** (in Minas Gerais, Paraná, Rio Grande do Sul, Santa Catarina, and São Paulo) = $12\frac{1}{2} \times 25$ braças = $27\frac{1}{2} \times 55$ m = 1512.50 m²;

1 **celamim** (in Mato Grosso) = $12\frac{1}{2} \times 6\frac{1}{4}$ braças = $27\frac{1}{2} \times 13\frac{3}{4}$ m = 378.125 m²;

1 **data** (in all states) = 10×20 braças = 22×44 m = 968 m²;

1 **litro** (in all states) = 5×25 braças = 11×55 m = 605 m².

75.5 Units of Volume

Traditional system

			Metric
pé cubico			35.937 dm ³
$3\frac{3}{8}$	palmo cubico		9.548 dm ³
1 728	512	pollegada cubico	1.9 cm ³

Some measures after metrification:

1 **corda** (for firewood) = 2 m³.

75.6 Units of Dry Capacity

For general use and for salt

							Metric	Metric
tonel							6526.8 L	7336.8 L
2	pipa						3263.4 L	3668.4 L
3	1½	mojo or moio					2175.6 L	2445.6 L
30	15	10	almude				217.56 L	244.56 L
180	90	60	6	alquiera			36.26 L	40.76 L
360	180	120	12	2	canada		18.13 L	20.38 L
720	360	240	24	4	2	quarta^a	9.065 L	10.19 L

^aAlso reported as¼ of the weight of 1 alquiera

Other measures reported during the nineteenth century:

1 **mate** (for cereals) = 2–8 L.

Metric-linked system usually used for cereals

							Metric
tonel							7200 L
3	mojo						2400 L
30	10	almude					240 L
90	30	3	quimo				80 L
180	60	6	2	alqueire			40 L
1440	480	48	16	8	resquarto		5 L
14,400	4800	480	160	80	10	caneca	500 mL

75.7 Units of Liquid Capacity

Traditional system during the early nineteenth century

			Metric
pipa			400.725 L
25	almude^a		16.029 L
292½	11⅞	canada	1.37 L

^aVaried by location between about 16 L and 33 L

Traditional system during the mid-nineteenth century

							Metric
tonel^a							958.32 L
2	pipa^b						479.16 L
3	1½	mojo or moio					319.44 L
30	15	10	almude				31.944 L
360	180	120	12	canada^c or medida			2.662 L
1440	720	480	48	4	quartilho		665.5 mL
2880	1440	960	96	8	2	garrafa^d	332.75 mL

^aVaried by location between about 20 and 1000 L

^b1 **pipa** (for syrup at Bahia) = 100 canadas = 720.750 L; 1 **pipa** (for rum at Bahia) = 72 canadas = 518.940 L

^c1 **canada** (at Bahia) = 7.207 50 L

^dAlso reported as equal to 1 quartilho = 665.5 mL

Metric-linked system

										Metric
tonel										1000 L
1¼	Oitavo									800 L
2	1⅓	pipa								500 L
2½	2	1¼	baril							400 L
3	2⅔	1½	1⅓	mojo or moio						333.33 L
5	4	2½	1⅓	1⅔	quarterola					200 L
30	24	15	12	10	6	almude				33.33 L
60	48	30	24	20	12	2	moriaga			10 L
216	172⅔	108	86⅔	72	43⅓	7⅓	3⅓	canada or medida		2.778 L
864	691⅓	432	345⅓	288	172⅔	28⅔	14⅔	4	quartilho	694.4 mL
1728	1382⅔	864	691⅓	576	345⅓	57⅓	28⅔	8	2	garrafa 347.2 mL

Other measures reported during the twentieth century:

1 **balaio grande** (large) = 40–50 L;

1 **décimo** = 40–50 L;

1 **cesto** = ~40 L;

1 **celemin** (in northern Goiás) = 10–20 L;

1 **balaio pequeno** (small) = 5–20 L;

75.8 Units of Weight

Traditional system

										Metric
tonelada										793.241 9 kg
13½	quintal									58.758 7 kg
54	4	arrôba								14.689 7 kg
1728	128	32	arratel or libra							459.052 g
3456	256	64	2	marco						229.526 g
27,648	2048	512	16	8	onça					28.690 75 g
221,184	16,384	4096	128	64	8	oitava				3.586 34 g
663,552	49,152	12,288	384	192	24	3	escrópulo^a			1.195 45 g
3,981,312	294,912	73,728	2304	1152	144	18	6	quilate^a		199.24 mg
15,925,248	1,179,648	294,912	9216	4608	576	72	24	4	grão^a	49.81 mg

^aUsed for precious stones

For bananas

		Metric
talha		80 kg
10	racimo	8 kg

For coffee

			Metric
sacco			73.440 000 kg
5	arroba		14.688 000 kg
160	32	arratel	459.000 g

For firewood

		Metric
talha		100–300 kg
100	acha	1–3 kg

Other measures reported during the twentieth century:

- 1 **carro** = 600–1200 kg;
- 1 **marco** = ~570 kg;
- 1 **bale** (for cotton) = ~200 lbs = 90.7 kg;
- 1 **páo** (for sugar) = 90 kg;
- 1 **onca** = ~70 kg;
- 1 **lençol** (for cotton) = 60–64 kg;
- 1 **fardo** = 50–200 kg (varying by the commodity);
- 1 **sack** (for rough rice) = 50 kg;

- 1 **carga** = 40–60 kg;
- 1 **sack** (for milled rice) = 40 kg;
- 1 **mala** = 30–50 kg;
- 1 **bloco** (for rubber) = 30–45 kg;
- 1 **sarrão** = 30–45 kg;
- 1 **alqueire** (for salt at Pará) = 80 arrateis = 36.713 680 kg;
- 1 **corda** (for tobacco) = 25 kg;
- 1 **bushel** (for rough rice) = 45 lbs = 20.411 kg;
- 1 **caica** = 20–60 kg;
- 1 **racimo** (for coconuts) = 20 kg;
- 1 **manta** (for middle bacon) = 20 kg;
- 1 **alqueire** (for rice at Pará) = 40 arrateis = 18.356 840 kg;
- 1 **bola do sud** (for chewing tobacco) = 15 kg;
- 1 **canada** (for balsam at Pará) = 32 arrateis = 14.685 472 kg;
- 1 **mão** (for corn) = 12 kg;
- 1 **rolo** (for tobacco) = 10–90 kg;
- 1 **ristra** (for onion) = 10 kg;
- 1 **bola do norte** (for rubber) = 5 kg;
- 1 **barrica** = 2–189 kg;
- 1 **braça** (for tobacco) = 1–2 kg;
- 1 **jogo** (for fibers) = 1 kg;
- 1 **peça** = 360 g;
- 1 **racimo** (for grapes) = 300 g;
- 1 **espiga** = 240 g;
- 1 **felse** = 100–150 g;
- 1 **cabeça** = 20 g.

Metric-linked system

					Metric
tonelada métrica					1000 kg
10	quintal métrica				100 kg
$66\frac{2}{3}$	$6\frac{2}{3}$	arrôba métrica			15 kg
$1666\frac{2}{3}$	$166\frac{2}{3}$	25	libra métrica		600 g
5,000,000	500,000	75,000	3000	quilate métrica	200 mg

For gold and silver

						Metric
arratel						453.584 g
2	marco					226.792 g
16	8	onça				28.349 g
128	64	8	outava			3.544 g
384	192	24	3	escrúpulo		1.181 g
1152	576	72	9	3	dinheiro^a	393.7 mg

^aOnly used for silver

For medical use

					Metric
libra					344.250 000 g
12	onça				28.687 500 g
96	8	outava			3.585 937 g
288	24	3	scrópulo		1.195 312 g
6912	576	72	24	grão	49.805 mg

Apothecaries' scale

			Metric
arratel			342.144 g
12	onça		28.512 g

75.9.3 Units of Weight

For various dry commodities

			Metric
sirio			63.525–72.6 kg
$1\frac{3}{4}$ –2	alqueire		36.3 kg
$29\frac{1}{6}$ – $33\frac{1}{3}$	$16\frac{2}{3}$	Moio	2.178 kg

Other reported measures during the twentieth century:

1 arroba = 14.7 kg.

75.9 Bahia

75.9.1 Units of Length and Area

See Sects. [75.3-75.4](#).

75.9.2 Units of Dry Capacity

Traditional system

					Metric
mojo or moio					1868.508 L
15	fanga				124.567 20 L
60	4	alquiere^a			31.141 80 L
120	8	2	outava		15.570 90 L
240	16	4	2	maquia or selamin	7.785 45 L

^aVaried by location between 40 to 320 L. According to [CARD], 1 **alquiera** (in Bahia) = 35.24 L

75.10 Pernambuco

75.10.1 Units of Length

				Metric
légua de sesmaria				6600 m
3000	braça			2.2 m
30,000	10	palmo		220 mm

75.10.2 Units of Capacity

				Metric
pipa				484.7 L
13⅓	alqueire			36.4 L
175	13⅓	canada		2.77 L
440	33	2⅔	cuia	1.1 L

For cereals and salt

						Metric
mojo or moio						2407.245 000 L
15	fanga					160.483 600 L
60	4	alquiere				40.120 900 L
240	16	4	quarta			10.030 225 L
480	32	8	2	outava		5.015 112 L
960	64	16	4	2	maquia or selamin	2.507 556 L

75.10.3 Units of Weight

Metric-linked system for sugar

			Metric
chest			300 kg
2½	barrel		120 kg
4	1⅓	sack	75 kg

Other measures reported during the nineteenth century:

1 **ton** = 1000 kg;

1 **sack** (for cotton) = 85 kg;

1 **loaf** (for sugar) = 63.4 kg;

1 **arroba** = 15 kg.

75.11 Rio de Janeiro

75.11.1 Units of Length and Area

See Sects. [75.3](#)–[75.4](#).

75.11.2 Units of Dry Capacity

75.11.3 Units of Liquid Capacity

Traditional system

							Metric
tonel							1012.500 000 L
2	pipa^a						506.250 000 L
30	15	almude					33.750 000 L
60	30	2	pote				16.875 000 L
360	180	12	6	medida or canada^b			2.812 500 L
1440	720	48	24	4	quartilho or garrafa		703.125 mL
5760	2880	192	96	16	4	martelinho	175.781 mL

^aWhen used in urban commerce = 499.660 920 L, and for olive oil and rum = 1 English gallon = 3.785 310 L

^b1 **canada** or **medida**, as used in urban commerce, = 2.775 894 L

75.11.4 Units of Weight

Traditional system

									Metric
tonelada ^a									793.152 000 kg
13½	quintal								58.752 000 kg
27	2	baril							29.376 000 kg
54	4	2	arrôba						14.688 000 kg
1728	128	64	32	arratel					459.000 g
3456	256	128	64	2	meio arratel				299.500 g
27,648	2048	1024	512	16	8	onça			28.687 g
221,184	16,384	8192	4096	128	64	8	outava		3.586 g
663,552	49,152	24,576	12,288	384	192	24	3	scrópulo	1.195 g
15,925,248	1179,648	589,824	294,912	9216	4608	576	72	24	grão 50 mg

^aFor maritime use = 2 240 lbs av = 1 016.047 542 kg

For gold and silver

					Metric
arratel ^a					459.049 g
2	marco				229.524 g
16	8	onça			28.690 6 g
128	64	8	outava		3.586 32 g
384	192	24	3	escrúpulo	1.195 44 g

^aDuring the mid-nineteenth century, also reported as 458.98 g and as 459.000 g

For diamonds and jewels

			Metric
outava			3.585 937 g
18	quilat		199.214 mg
72	4	grão	49.805 mg

Other measures reported during the twentieth century:

1 **barrica** (for wheat flour from the U.S. and Trieste) = 88.128 000 kg.

76 British Cameroons

See *Cameroon*.

77 British Central African Protectorate

See *Malawi*.

78 British East Africa

See *Kenya*.

79 British Guiana

See *Guyana*.

80 British Honduras

See *Belize*.

81 British India (1858–1947)

See *India*.

82 British Indian Ocean Territories

The British Indian Ocean Territories were established out of parts of the Outer Seychelles and Mauritius in 1965. In 1976, the former Seychelles territories were returned to Seychelles, and the former Mauritius territories remained part of the British Indian Ocean Territories. It is now a British overseas territory.

82.1 Currency

1965–: 1 pound sterling = 240 pence
1 US dollar = 100 cents

83 British New Guinea

See *Papua New Guinea*.

84 British North Borneo

See *Malaysia*.

This area was a British protectorate under the sovereign North Borneo Chartered Company from 1882 until 1946, when it became a British crown colony called British North Borneo. The island of Labuan was attached to Singapore in 1907, became an independent settlement of the Straits Colony in 1912, and was incorporated with British North Borneo in 1946. British North Borneo became part of Malaysia, as the state of Sabah, in 1963.

84.1 Currency

1953–1967: 1 Malaya and British Borneo dollar = 100 cents
1882–1953: 1 British North Borneo dollar = 100 cents

85 British Raj

See also *Aden*, *Bangladesh*, *Burma*, *India*, *Pakistan*, and *Sri Lanka*.

The British Raj extended over present-day India, Burma, Pakistan, Sri Lanka, and Bangladesh. In addition, it included Aden Colony (from 1858 to 1937), Lower Burma (from 1858 to 1937), Upper Burma (from 1886 to 1937), British Somaliland (briefly, from 1884 to 1898), and Singapore (briefly, from 1858 to 1867). Nepal was taken over from the Empire of China in 1908. Sikkim was a British protectorate.

86 British Solomon Islands

See *Solomon Islands*.

87 British Somaliland

See *Somaliland*.

88 British Virgin Islands

See also *United Kingdom*.

These islands were discovered by Christopher Columbus in 1493, and later became part of the administration of the Leeward Islands. In 1950, the Virgin Islands became a British crown colony. A new constitution in 1967 provided for a ministerial government and the islands subsequently became a British overseas territory.

89 British West Africa

See also *Gambia, Ghana, Nigeria, and Sierra Leone*.

The British West African Settlements were an administrative grouping of Great Britain's West African colonies. In 1957, the Gold Coast gained its independence under the name of Ghana. In 1960, Sierra Leone and Nigeria became independent. Gambia gained independence in 1965.

1 Malaya and British Borneo dollar = 100 cents

1945–1953: 1 Malayan dollar = 100 cents

1942–1945: 1 Japanese Gumpyo dollar

1939–1942: 1 Malayan dollar = 100 cents

1904–1941: 1 Straits Settlements dollar = 100 cents

–1904: 1 Indian rupee = 100 paisas

90 Brunei

In the 1400s, Brunei broke away from Javanese rule and became an independent sultanate. From the early 1400s to the 1500s, Brunei ruled over large parts of Borneo and many of the Philippine islands. The Sultan's power declined when the Europeans took over trade in the region. Brunei became a British protectorate in 1888 and a British dependency in 1905. Independence was declared in 1984.

The Metric system has been official since 1986 and compulsory since 1991.

Main sources: [GROO2], [UN55], and [UN66]

90.2 Units of Length

1 **ela** = 1 yd = 0.914 4 m.

90.3 Units of Capacity

British Imperial linked system

			Imperial	Metric
gantang			1 gal	4.546 1 L
1⅔	pau		2 gills	2.841 3 L
4	2½	chupak	1 qt	1.136 5 L

90.1 Currency

1967–: 1 Brunei ringgit = 100 sens

1963–1967: 1 Malayan ringgit = 100 sens

1953–1963:

90.4 Units of Weight

Traditional system

						Metric
koyan						2419 kg
13⅓	bhara					181.43 kg
40	3	pikul or picul				60.475 kg
666⅔	50	16⅔	gantang^a			3.629 kg
1000	75	25	1½	gantang^b		2.419 kg
4000	300	100	6	4	kati or saga	604.75 g
64,000	4800	1600	96	64	16	tahil 37.80 g

^aFor rice. According to [GROO2], estimated as about 3.2 kg

^bFor paddy

For gold

			Metric
mas or hoon			3.78 g
10	chuchok or chee		378 mg
100	10	kupang	37.8 mg

91 Bukhara

See also *Uzbekistan*.

Around about 700 CE, this area became incorporated into the Empire of the Umayyad caliphs. The Shaybanid dynasty ruled the Khanate of Bukhara from 1500 until 1598, when it came under the Janid dynasty. It was established as the Emirate of Bukhan in 1785 and became a Russian vassal in 1868. It was declared the Bukharan Soviet People's Republic in 1920, and became part of the Uzbekistan SSR in 1925.

Main sources: [BURT3], [DAVIS], [KAHN], [LEHM], and [MEYE3]

91.1 Currency

1920–: 1 Russian/Soviet ruble = 100 kopeks
 –1923: 1 Bukharan tenga or tanga = 10 falus

According to [KAHN]

						Metric
batmān						19.656 kg
4	un-ser					4.914 kg
8	2	kirk-ar				2.457 kg
32	8	4	un-ar			614.250 g
64	16	8	2	bisch-ar		307.125 g
160	40	20	5	2½	oschigimār-ar	122.850 g

91.2 Units of Length

During the early nineteenth century, according to [MEYE3]

			Metric
farsakh			12,840 m
4000	kar ^a		3.21 m
12,000	3	hazé	1.07 m

^aOften used for measuring cotton cloth

91.3 Units of Area

For land areas:

1 **tanab** = 3600 square hazés = 4121.64 m².

91.4 Units of Weight

Traditional measures reported during the seventeenth century:

1 **kharvār** (donkey load) or 1 **shuturwār** (camel load) = 255.6 kg (for opium).

1 **lan**, **laen**, or **liang** (for silver) = 38.4–42.7 g (in 1657 according to traveller Fedor Isakovich Baikov (1612–63)), 36 g (in 1669, according to traveller Seitkul Ablin (1653–72)), and 30.9 g (in 1721, according to traveller Lorenz Lange (1690–1752)).

According to [LEHM]

		Metric
(heavy) batmān		129 kg
30,000	zoltnik	4.3 g

According to [DAVI5]

		Metric
(heavy) batmān		127.96 kg
312½	Russian pound^a	409.47 g

^aAccording to [LEHM] = 409.52 g

According to [DAVI5]

		Metric
(small) batmān		25.6 kg
5120	mithqāl	5 g

For saltpetre in 1660s⁹

		Metric
(small) batmān		24.5 kg
1½	pud	16.3 kg

For general use during the eighteenth century

			Metric
chetvert			196.56 kg
1⅓	berkovets		163.80 kg
12	10	pud	16.38 kg

During the early nineteenth century, according to [MEYE3]

						Metric
shuturwār						262.208 kg
2	(heavy) batmān					131.104 kg
16	8	sir				16.388 kg
128	64	8	tcharik			2.048 5 kg
512	256	32	4	nimtcha		512.125 g
54,784	27,392	3424	428	107	mitscal	4.786 g

During the nineteenth century

		Metric
(small) batman		19.656 kg
16	jigirm'a ar	1.228 5 kg

Other measures reported by [BURT3]:

- 1 **shuturwār** (as used by Russian colonisers during the nineteenth century) = 16 pud = 262.088 kg;
1 **sharī'a bātman** = 864 g.

⁹ Kotilaine, Jarmo T. *Russia's foreign trade and economic expansion in the seventeenth century: Windows on the world*. Leiden: Brill, 2005.

92 Bukovina

See also *Romania* and *Ukraine*.

In 1775, this area became known as Bukovina upon the region's annexation from the Principality of Moldavia to the possession of the Habsburg Monarchy. It became part of the Austrian Empire in 1804, a Duchy in 1847, and part of Austria-Hungary in 1867. Romania took control of the area in 1918 after WWII.

Main source: [HIMK]

92.1 Units of Length

At Chernivtsi before 1857

		Metric
Praschine		5.689 452 m
16	Fuss	355.590 75 mm

Vienna scale at Chernivtsi after 1857

				Metric
Meile				9482.421 m
5000	Klafter			1.896 484 m
1500	3	Elle		632.161 mm
3000	6	2	Fuss	316.081 mm

Other reported measures:

- 1 **Elle** (at Chernivtsi before 1857) = 623.37 mm.

92.2 Units of Dry Capacity

At Chernivtsi before 1836

					Metric
Mirze					185.050 000 L
2	Kübel				92.525 000 L
8	4	Viertel			23.131 250 L
16	8	2	Ur		11.565 625 L
128	64	16	8	Maass	1.445 703 L

At Chernivtsi after 1836 and after 1855

						Metric	Metric
laszt						3689.209 2 L	3691.477 8 L
30	korzec					122.973 64 L	123.049 26 L
120	4	cwierzi				30.743 41 L	30.762 31 L
960	32	8	garniec			3.842 926 25 L	3.845 289 37 L
3840	128	32	4	kwart		960.731 56 mL	961.322 34 mL
15,360	512	128	16	4	kwartarek	240.182 89 mL	240.330 59 mL

92.3 Units of Liquid Capacity

For general use at Chernivtsi (two reported scales)

				Metric	Metric
wadra, wiader, or viadra				12.75 L	10.95 L
10	oka			1.275 L	1.095 L
40	4	litra		318.75 mL	273.75 mL
4000	400	100	dramm	3.187 5 mL	2.737 5 mL

For wine at Chernivtsi

		Metric
wadra or viadra		14.147 25 L
10	oka	1.414 725 L

For spirits at Chernivtsi

		Metric
wadra or viadra		16.976 70 L
12	oka	1.414 725 L

92.4 Units of Weight

Traditional system before 1855 and after 1855

				Metric	Metric
kantar				61.606 93 kg	56.365 601 6 kg
44	oka			1.400 157 5 kg	1.281 036 4 kg
176	4	littre		350.039 38 g	320.259 1 g
17,600	400	100	dramm	3.500 39 g	3.202 59 g

At Chernivtsi

			Metric
oka			1.283 74 kg
4	littre		320.935 g
400	100	dramm	3.209 35 g

For fine use at Chernivtsi after 1855

			Metric
dramm			320.259 g
16	karat		200.16 mg
64	4	gran	50.04 mg

93 Bulgaria

See also *the Ottoman Empire*.

From the late 900s to the late 1100s, Bulgaria was mostly integrated into the Byzantine Empire. In 1395, Bulgaria was conquered by the Ottoman Empire, which it then belonged to until 1878. The country was declared independent in 1908.

Prior to the Metric system, many of the Ottoman units were in use. The Metric system has been official since 1888, and compulsory since 1892.

Main sources: [LAMO], [LAPA], [MART3], [SARL], [SERB], [UN55], [UN66], and [VEKO]

93.1 Currency

1999–:	1 Bulgarian lev = 100 stotinki
1962–1999:	1 hard lev = 100 stotinki
1952–1962:	1 Socialist lev = 100 stotinki
1882–1952:	1 Bulgarian lev = 100 stotinki
1878–1880:	1 French franc = 100 centimes
–1885:	1 Ottoman Empire piastre

93.2 Units of Length

Ottoman-linked system

					Metric
fersahi-kadim					5685.00 m
7500	arşin or zirai-mimari ^a				758.00 mm
180,000	24	parmak ^a			31.58 mm
2,160,000	288	12	hat ^a		2.63 mm
25,920,000	3456	144	12	nokta ^a	0.22 mm

^aMainly used by masons

Ottoman-linked system for tailors and bazaars

			Metric
arşin			680.00 mm
8	rup		85.00 mm
16	2	grech	42.50 mm

Ottoman linked system for cloth

			Metric
endaze or lak't			650.00 mm
8	rup		81.25 mm
16	2	grech	40.625 mm

Some other reported measures:

- 1 **arşin** = 685.8 mm, but also reported¹⁰ as 670 mm;
 1 **kot** (for silk and linen) = 641.1 mm.

Other reported measures during the nineteenth century:

- 1 **kiló** (in Ruse) = 216.558 L;
 1 **Zarigradsko kiló** (Istanbul-system) = 37.0 L.

93.3 Units of Area

			Metric
lèkhà			229.799 1 m ²
30 ⁴⁵ / ₈₀	denum		7.525 145 6 m ²
488 ³ / ₅	16	arschin ²	0.470 321 6 m ²

Other measures reported during the nineteenth and twentieth centuries:

- 1 **stremma** (in Naousa) = about 1600 m²;
 1 **dékare** (декар) = 1000 m²;
 1 **dulum** = 919 m².

93.4 Units of Dry Capacity

Ottoman-linked system, based on [VEKO]

			Metric
kile			37.000 L
4	şinik		9.250 L
8	2	kutia	4.625 L

At Varna

			Metric
kilò			144.372 L
10	vedro		14.437 L

Metric-linked system for grain

				Metric
kiló				100 L
5	krina			20 L
10	2	vedro		10 L
100	20	10	koutel or cutelu	1 L

93.5 Units of Liquid Capacity

			Metric
vedùrnik or vedùrnicu			128.0 L
10	vedro		12.8 L

In the Danube valley

			Metric
Dunavsko kiló			128.30 L
10	krina		12.83 L
100	10	oka	1.283 L

Metric-linked system for milk and wine

					Metric
kiló					100 L
5	krina				20 L
10	2	vedro			10 L
20	4	2	povolok		5 L
100	20	10	5	koutel or cutelu	1 L

93.6 Units of Weight

Ottoman-linked system, based on [VEKO]

					Metric
čekija					225.798 3 kg
4	kantar				56.449 580 kg
176	44	oka			1.282 945 kg
400	100	2 ³ / ₁₁	ludra		564.496 g
70,400	17,600	400	176	dram	3.207 g

¹⁰ [FRÖH].

System based on [SERB] and [MART3]

					Metric	Metric
tovar					128.200 kg	127.800 kg
2 $\frac{3}{11}$	kantar				56.408 kg	56.232 kg
100	44	oke or okka ^a			1.282 kg	1.278 kg
400	176	4	rottet		302.5 g	319.5 g
40,000	17,600	400	100	dram ^b	3.025 g	3.195 g

^aAlso used for wine

^bEqual to 72 Babylonian barleygrains (= about 44.5 mg each)

Other reported measures:

1 **untzia** or **ounce** (for silkworm eggs) = 30 g.

At Constantinople and Varna

		Metric
kantar		55 kg
44	oka	1.25 kg

At Samokov (before and after metrification)

		Metric	Metric
kantar		76.862 184 kg	75 kg
60	oka	1.281 036 kg	1.25 kg

Ottoman system for fine use, based on [VEKO]

			Metric
okka			1.282 945 kg
400	dram		3.207 g
6400	16	krat	0.200 g

94 Burkina Faso [Formerly: Upper Volta, Republic of Upper Volta]

From the 1200s, three major kingdoms were formed in this area: Tengkodogo, Yatenga and Wogodogo. During the 1890s, the area was conquered by the French, and in 1897, it was attached to French Sudan. In 1919, Upper Volta became a separate French colony. It was

partitioned among the French Sudan, Côte d'Ivoire and Niger in 1933. The area was reconstructed as a colony within French West Africa in 1947. Independence was declared in 1960, and the state was renamed Burkina Faso in 1984.

The Metric system has been official since 1884, and compulsory since 1907.

Main sources: [BART], [DELA2], [DELA3], and [SUND]

94.1 Currency

1945–: 1 West African CFA franc = 100 centimes
 1919–1945: 1 West African franc = 100 centimes
 –1919: 1 French franc = 100 centimes
 1 Maria Theresa Thaler

94.2 Units of Length

For cloth at Libtako, based on [SUND]

		Metric
faranel		~18 m
30	dra	~0.6 m

94.3 Units of Dry Capacity

System used during the late nineteenth century

						Metric
tu-djere						~40 L
10	sawal					~4 L
20	2	artel				~2 L
40	4	2	mude, mutukal, or moudd			~1 L
80	8	4	2	attumun		~500 mL
160	16	8	4	2	nustumum	~250 mL

94.4 Units of Weight

Some measures reported, by [DELA2, p. 111], as used for weighing gold among the Bobo and Lobi people during the late nineteenth century:

	mitkals	Metric
kumvila-wuru kele	10 ta	520 g
kumvila korondo	9 ta	468 g
kumvila fila	2 ta	104 g
kumvila kele	1 ta	52 g
metiklae luri	5 mitkals	23.25 g
metiklae nani	4 mitkals	18.60 g
metikale saüa	3 mitkals	13.95 g
metikale fila	2 mitkals	9.30 g
metikale kele	1 mitkal	4.65 g

Some measures used among the Mandé people, based on [DELA3, p. 279]:

	mitkals	Metric
wakiya, wakye or manna fila	8	32–36 g
ku	6½	26–29.5 g
manna or barifiri	4	16–18 g
dyugu	3	12–13.5 g
susu	2	8–9 g
na-mfe-suru	1½	6.66–7.5 g
dyuwa-suru	1½	6–6.75 g
tenkoro or metikale ba	1½	5.33–6.0 g
metikale	1	4–4.5 g
safa	1/3	1.33–1.5 g
dyakpa	1/6	0.66–0.75 g
bana fila	1/12	0.32–0.374 g
bana	1/24	0.16–1.187 g
demba or demma	1/48	1.08–0.093 g
de ni	1/96	0.04–0.046 g

95 Burma

See *Myanmar*.

96 Burundi [Formerly: Urundi]

See also *Rwanda*.

The plateau region of Ruanda-Burundi was occupied in ancient times by a pygmy people, who were gradually driven into the forests by Bantu tribes. During the fifteenth and sixteenth centuries, there came a further infiltration of the Watutsi people, who formed two kingdoms in present-day Ruanda and Burundi. In 1890, the present-day Burundi became part of the colony of German East Africa. After the First World War, the territory became a Belgian League of Nations-mandated territory, which was changed in 1946 to a United Nations trust territory. In 1962, the country was split when the Republic of Rwanda and the Kingdom of Burundi gained independence as separate states.

The weights and measures of South Africa are generally used.

Main source: [COX]

96.1 Currency

- 1964–: 1 Burundian franc = 100 centimes
- 1960–1964: 1 Rwanda and Burundi franc = 100 centimes

1916–1960: 1 Belgian Congo franc = 100 centimes
1904–1916: 1 German East African rupie = 100 heller
1890–1904: 1 German East African rupie = 16 annas = 64 pesa
sixteenth–nineteenth centuries: 1 conus (shell)

96.2 Units of Quantity

1 **umu-kama** = a bundle of grass or grain;
1 **umu-gānda** = a bundle of sticks.

96.3 Units of Length

South African system

			Metric
Cape rood			3.778 3 m
12	Cape foot		314.858 mm
144	12	Cape inch	26.238 mm

Other measures reported as used

1 **yard** (for textiles) = 0.914 4 m.

96.4 Units of Area

South African system

			Metric
Morgen			8565.3 m ²
600	Cape rood²		14.275 5 m ²
86,400	144	Cape foot²	9.913 5 dm ²

96.5 Units of Dry Capacity

South African system

			Metric
gallon			4.546 090 L
4	quart		1.136 522 L
8	2	pint	568.261 mL

96.6 Units of Liquid Capacity

South African system

			Metric
leaguer			577.034 914 L
5 ⁷ / ₂₄	mud or muid		109.045 968 L
127	24	gallon	4.543 582 L

96.7 Units of Weight

South African system

			Metric
Capeton			907.184 000 kg
10	bag		90.718 400 kg
2000	200	pound	453.592 g

For medical use

					Metric
pfund					369.125 8 g
12	unze				30.760 48 g
96	8	drachm			3.845 06 g
288	24	3	skrupel		1.281 69 g
5760	480	60	20	gran	64.08 mg

97 Byelorussian Soviet Socialist Republic

See *Belarus*.

98 Cabinda

See *Angola*.

When Portuguese explorers and traders arrived in the region at the mouth of the Congo River during the mid-fifteenth century, there were three kingdoms in what is present-day Cabinda, namely, Kakongo, Loango, and Ngoyo. In 1885, Cabinda became a protectorate of the Portuguese Crown, known as Portuguese

Congo. Since 1972, Cabinda has been treated as a district of Angola.

98.1 Currency

- eighteenth century:

pieces of woven cloth, 5, 10, or 100 cortades in length, were used as currency in the Kingdom of Loano.
- eighteenth century:

1 mbadi or mbari = a bunch of fibres from either Raphia palm or banana

Khmer Rouge out of Phnom Penh, and the country was renamed the Peoples’ Republic of Kampuchea. In 1993, the country was restored as a constitutional monarchy and renamed Cambodia.

The oldest known units of measurement in the area were influenced by Chinese, Vietnamese and Thai measures. The Metric system has been compulsory since 1914.

Main sources: [AYMO], [CARD], [LECL], [MART3], [MMC], [UN54], [UN55], [UN66], [WICK], [WISE], and [ZIMM]

99 Cambodia [Formerly: Khmer Republic, Kampuchea Republic]

From the 500s to the 1200s, the Khmer civilization flourished in this area. Cambodia was an independent kingdom until it became a French protectorate in 1863. This was consolidated by a treaty in 1884. It became part of French Indochina in 1885, an associated state within the French Union in 1949, and declared itself as an independent monarchy in 1953. In 1970, Cambodia became the Khmer Republic. The Khmer Rouge insurgents took control of the government in 1975 and renamed the country Democratic Kampuchea. In 1979, the Vietnamese regulars and Cambodian rebels drove the

99.1 Currency

- 1980– :

1 Cambodian riel = 10 kak = 100 sens
- 1975–1980:

Khmer riel banknotes, but no monetary system
- 1953–1975:

1 Cambodian riel = 100 sens
- 1885–1952:

1 Cochinchina piaster = 100 cents = 500 sapeque
- 1875–1885:

1 Cambodian franc = 100 centimes
- 1875:

1 Cambodian tical or baht = 4 salong = 8 fuang = 32 pe = 64 att

99.2 Units of Length

The Khmers used a unit called a **yau** for measuring lengths of cloth. There is no known standard length for this unit.

Vietnamese-linked system in Udong

							Metric
gon							191.640 000 m
10	caivai						19.164 000 m
30	3	duong or truong					6.388 000 m
300	30	10	teoc				638.800 mm
3000	300	100	10	tac			63.880 mm
30,000	3000	1000	100	10	fan		6.388 mm
300,000	30,000	10,000	1000	100	19	li	638.8 μm

Siam-linked system, upper scale

					Metric
yot, yote, jod or jot					15,375.6 m
4	roe neng				3843.9 m
400	100	sen or neng			38.439 m
8000	2000	20	wah, va, vōuá, or voua		1.921 9 m
16,000	4000	40	2	ken	960.975 m

Siam-linked system, lower scale

					กระเปียด	Metric
ken						960.975 m
2	sauk, sawk, sock, or sok					480.488 mm
4	2	keup, keub or kab				240.244 mm
48	24	12	nieu, niew, niou or niu			20.02 mm
192	96	48	4	kabiet		5.00 mm
384	192	96	8	2	amukabiet or anukabiet	2.502 mm

Traditional system, upper scale, during the mid-nineteenth century, based on [AYMO] and [ZIMM]

							Metric
me-loùch							16,000 m
4	moroi sen or moroi						4000 m
400	100	sen					40 m
4000	1000	10	thbaung				4 m
8000	2000	20	2	phiéem^a			2 m
40,000	10,000	100	10	5	hat^b		400 mm
42, 666 ² / ₃	10, 666 ² / ₃	106 ² / ₃	10 ² / ₃	5 ¹ / ₃	1 ¹ / ₁₅	châmam	375 mm

^aFor cloth^bUsing measurements taken from 200 dimensions of the temple of Angor Wat (built in the *twelfth century*), researchers calculated that the value most nearly dividing the dimensions by a whole number is 435.45 mm, which makes that number a likely estimate for the magnitude of the hat at the time of construction [STEN]

Traditional system, lower scale, during the mid-nineteenth century, based on [AYMO] and [ZIMM]

							Metric
hat							400 mm
1 ¹ / ₁₅	châmam						375 mm
12 ² / ₃	12	thnâhp					31.250 mm
153 ² / ₃	144	12	krâhp srau^a				2.604 167 mm
1843 ² / ₃	1728	144	12	khluon chay			217.014 µm
22, 118 ² / ₃	20,736	1728	144	12	pong chay^b		18.084 µm
176, 947 ² / ₃	165,888	13,824	1152	96	8	anu^c	2.261 µm

^aThe length of a grain of rice^bThe breadth of a body louse^cThe breadth of a grain of sand

Metric-linked upper scale (**mot thouch, muoi** or **muoi mètre** after 1914) , based on [UN54]

						Metric
yoch						16 km
400	sen					40 m
8000	20	phyéam or phylom				2 m
16,000	40	2	mot thouch, muoi, or muoi mètre			1 m
32,000	80	4	2	hat		500 mm
64,000	160	8	4	2	châmam or cham am	250 mm

Metric-linked lower scale, based on [UN54]

						Metric
châmam or cham am						250 mm
12	thnâhp or thneap					20.833 3 mm
96	8	krâp srau				2.604 2 mm
1152	96	12	khluon chay			217.014 µm
13,824	1152	144	12	pong chay		18.084 µm
165,888	13,824	1728	144	12	annuk or anuk	1.507 µm

99.3 Units of Area

Siam-linked system and Metric-linked system

			Metric	Metric
hâi or rai			~1024 m ²	1600 m ²
4	ngáane, ngarn, or ngan		~256 m ²	400 m ²
400	100	wáa or talangva	~2.56 m ²	4 m ²

99.4 Units of Volume

Some reported measures:

- 1 **phlan, chevron, or phlang** (Metric linked) = 100 dm³;
 1 **kavan** = 152 dm³.

99.5 Units of Dry Capacity

Traditional system for paddy in Udong

			Metric
thang			112.0 L
2	teu or tao		56.0 L
4	2	hao	28.0 L

Metric-linked system for cereals

						Metric
sêsep litre^a or vuong mot gia						40 L
1 ¹ / ₃	thang^b					30 L
2	1 ¹ / ₂	thúng				20 L
2 ² / ₃	2	1 ¹ / ₃	tao^b			15 L
5 ¹ / ₃	4	2 ² / ₃	2	kantang		7.5 L
40	30	20	15	7 ¹ / ₂	muoi litre^a or vuong mot bat tay	1 L

^aName used after 1914

^bUsually for paddy

99.6 Units of Liquid Capacity

Traditionally liquids were sold by weight.

Some reported preMetric measures:

1 **kavan** = about 152.9 L.

Metric-linked system

					Metric
kavan					150 L
1½	phlang				100 L
¾	2½	sêsep litre^a			40 L
8⅓	5%	2%	tougue, toque, or touque		18 L
150	100	40	18	thonan or muoi litre^a	1 L

^aThis name was used after 1914

99.7 Units of Weight

For rice in Udong

			Metric
picul^a or pikul			60.478 700 kg
4%	teu or tao		14.514 888 kg
100	24	cahn	604.787 g

^aSometimes also reported as about 68 kg

For commercial use in Udong

							Metric
ta or pikul							60.479 020 kg
2	thang						30.239 510 kg
100	50	cahn or catty					604.790 200 g
1600	800	16	luong, damleng, or täel				37.799 387 g
16,000	8000	160	10	dong or candarin			3.779 939 g
160,000	80,000	1600	100	10	fan		377.994 mg
1,600,000	800,000	16,000	1000	100	10	li	37.799 mg

Metric-linked system, based on [CARD]

								Metric
hap, hab, or picul								60 kg
2	chong							30 kg
100	50	néal or livre						600 g
1600	80	16	täel or damleng					37.50 g
4000	2000	40	2½	bat or thil^a				15 g
16,000	8000	160	10	4	chi or chin^a			3.75 g
160,000	80,000	1600	100	40	10	hun or jin^a		375 mg
1,600,000	800,000	16,000	1000	400	100	10	li or lin^a	37.5 mg

^aUsed for precious metals

Some other reported measures after 1914:

- 1 **hocsep** = 60 kg;
- 1 **pram rôì** or **mot can tay** = 1 kg;
- 1 **muoi gramme** or **mot dong can tay** = 1 g.

**100 Cameroon [Formerly:
Kamerun, German Kamerun,
British Cameroons, French
Cameroun]**

The Portuguese arrived on the Cameroon coast in the 1470s, but subsequently lost the slave trade to the Dutch in the 1600s. The British colonized Cameroon in the 1840s. It became a German colony, German Kamerun, in 1884. The French and British began occupying Cameroon in 1916, and finally, the area was divided into British Cameroon and French Cameroon in 1919. Most of the area became a French Mandate in 1922, and in 1946, a trust territory of the United Nations. French Cameroon was part of French Equatorial Africa, and gained its independence in 1960. In 1961, the northern part of British Cameroon united with Nigeria, and the southern part of British Cameroon merged with the Federal Republic of Cameroon.

In the French parts, the metric system has been officially used since 1894 and compulsory since 1961. In 1964, Ahmadou Babatoura Ahidjo (president, 1960–1982) replaced the West Cameroon British Imperial system of weights and measures with the East Cameroon metric system.¹¹ The metric system became the only legally accepted system in 1971. During the late twentieth century, the metric system was used exclusively in Yaounde and Douala, but the English system was still reported as being used in some rural areas.¹²

Main sources: [CARL2], [FITZ], [KONI], [QUIN2], [RAJE], and [RUDI]

¹¹ [KONI, p. 55].

¹² [RAJE].

100.1 Currency

- 1962–: 1 CFA franc = 100 centimes
- 1961–1962: 1 British Cameroon pound = 20 shillings = 240 pence
- 1920–1962: 1 West African franc = 100 centimes
- 1916–1920: 1 French franc = 100 centimes
- 1915–1961: 1 pound sterling = 20 shillings = 240 pence
- 1914: 1 Cameroon Mark = 100 Pfennig
- 1897–1918: 1 German Mark = 100 Pfennig
- nineteenth century: Rosary peas (*abrus precatorius*)
- nineteenth century: kirdi currency (used by the Kirdi people) = rolled and looped iron, made into stylized forms of everyday objects

100.2 Units of Length

British Imperial-linked system in Western Cameroon

				Metric
mile				1609.315 m
1760	yard			914.383 mm
5280	3	foot		304.794 mm
63,360	36	12	inch	25.399 mm

Other reported measures:

- 1 **mille** (marine use) = 1853.182 m.

100.3 Units of Area

Some reported measures for agricultural use:

- 1 **acre** = 4047 m²;
- 1 **centiare** = 1 m².

100.4 Units of Volume

Metric-linked system for wood

		Metric
décastère		10 m ³
100	décistère	100 dm ³

100.5 Units of Dry Capacity

For trading in German Kamerun before 1894 [FITZ, pp. 82–83], [RUDI, pp. 223–224] and [QUIN2, p. 64]

kru ^a				
2	beloko			
4	2	keg		
8	4	2	piggin	
20	10	5	2½	iron bar

^aThe amount of European merchandise that could be traded for a quantity of African goods fixed at a value of one pound Sterling

Some measures used in the Bamenda market during the twentieth century:

Bags or Kerosene tins were used for maize and grains.

The Kerosene tins measured about 240 x 238 x 355 = 20.3 L or about 235 x 235 x 357 mm = 19.7 L.

Some measures used in the Muea market during the twentieth century:

Heaps were used for yams and cocoyams, bunches for plantains and “hands” for bananas.

Some measures used in the Tiko and Kumba markets during the twentieth century:

A cup, used for garri, groundnut and beans, was a cylindrical cup that can hold 50 cigarettes. There were also small bundles for koki beans and groundnut paste.

Some other reported measures:

- 1 **bar** (for palm kernels) = 8.0 L;
- 1 **chi-peta** (for cereals) = a winnowing basket of unknown size.

100.6 Units of Liquid Capacity

British Imperial-linked system in Western Cameroon

			Metric
bushel			36.348 656 L
8	gallon		4.543 582 L
64	8	pint	567.948 mL

Some other reported measures:

- 1 **bar** (for palm oil) = 4.0 L;
- 1 **tots** (for spirits) = about 1 cL.

100.7 Units of Weight

British Imperial-linked system

			Metric
tonneau or ton			907.184 74 kg
20	cent, cental, or quintal		45.359 237 kg
2000	100	livre or pound	453.592 37 g

101 Canada

Scandinavian Vikings visited this area soon after 1000 CE. Beginning in the early sixteenth century, both the French and British set up colonies in Canada. Britain acquired Hudson Bay, Newfoundland and Nova Scotia from the French in 1713. In 1763, the British had gained control over all of New France. Upper and Lower Canada (present-day Ontario and Quebec) were united as the Province of Canada in 1841, and the Dominion of Canada (including Ontario, Quebec, Nova Scotia and New Brunswick) was established in 1867. The Hudson Bay Company’s territories were acquired in 1869 and formed the provinces of Alberta, Manitoba and Saskatchewan. British Columbia joined the Dominion in 1871, followed by Prince Edward Island in 1873. The Arctic Archipelago was annexed in 1895, as was Newfoundland in 1949.

None of the Canadian colonies or provinces created any new systems of measurement. All systems in common use were adopted from previously-existing systems within the homelands, England and France, of the settlers. Nova-Scotia adopted the English system in 1758, as did New Brunswick in 1786, Upper Canada in 1792, Prince Eward Island in 1795, Newfoundland in 1834 and British Columbia in 1867. In 1799, Lower Canada officially adopted both the English and French systems. In 1871, the Parliament of Canada legalized use of the metric system throughout Canada, but until 1873, all metrological systems in Canada were defined by provincial statutes and law. In 1873, the English systems became officially defined in

order to establish uniform systems for the entire Dominion of Canada. The metric system has been compulsory since 1976.

Main source: [ROSS]

101.1 Currency

1858–: 1 Canadian dollar = 100 cents

–1857: 1 Canadian pound = 20 shillings = 240 pence

101.2 Units of Length

101.2.1 British Columbia (1858–1871)

In 1867, adopted the British Imperial Linear System.

101.2.2 Lower Canada (1663–1867)

In 1676, adopted the **units aulne** (= aune) and **demie aulne** (= demi aune).

In 1799, adopted the English Standard Linear System and *Système de longueur du pied du roi*.

101.2.3 New Brunswick (1784–1867)

In 1786, adopted the English Standard Linear System.

101.2.4 Newfoundland (1832–1900)

In 1834, adopted the Imperial Linear System.

101.2.5 Nova Scotia (1758–1867)

In 1758, adopted the English Standard Linear System.

101.2.6 Prince Edward Island (1773–1873)

In 1795, adopted the English Standard Linear System.

101.2.7 Upper Canada (1791–1867)

In 1792, adopted the English Standard Linear System.

1 **point** (typographical) = about 4.089 4 mm;

1 **chaîne** = 1 Gunther's chain = about 20.116 8 m.

Legal scale for trade in Quebec

						Metric
arpent						58.471 020 m
10	perche					5.847 102 m
180	18	pied				324.839 mm
2160	216	12	pouce			27.070 mm
25,920	2592	144	12	ligne		2.256 mm
311,040	31,104	1728	144	12	point	188 µm

British Imperial-linked system

				Imperial	Metric
chainon				5½ yd	5.029 2 m
5½	verge			1 yd	0.914 4 m
5 ⁴ / ₅₀	1½ ₂₅	vara		33⅓ in	846.667 mm
198	36	33⅓	pouce	1 in	25.4 mm

101.3 Units of Area

British Imperial-linked system

		Metric
labor		716.8 m ²
1000	vara cuadrada	0.717 m ²

Legal scale in Quebec

			Metric
arpent de Paris			3418.868 3 m ²
100	perche carrée		34.188 683 m ²
32,400	324	pied de roi carré	10.552 1 dm ²

Other reported measures:

- 1 **section** (in Alberta, Manitoba, and Saskatchewan) = 1 mi² = about 259 ha.

101.4 Units of Dry Capacity

		Metric
minot		39.024 900 L
3	boisseau	13.008 300 L

101.4.1 British Columbia (1858–1871)

In 1867, adopted the Imperial Dry Capacity System.

101.4.2 Lower Canada (1663–1867)

In 1676, adopted Parisian measures such as the boisseau, comme minot, demi minot, pinte and pot (all unknown values).

In 1799, adopted the William III Winchester Corn Capacity System, along with such Canadian measures as the half minot, minot, poissen and pot (all values unknown).

After 1836:

1 **chaldron** (for coal) = 36 bu = 58.64 cu ft;

1 **bushel** (for coal) = 2814⁷/₁₄ cu in = 46.120 738 L.

101.4.3 New Brunswick (1784–1867)

In 1786, adopted the William III Winchester Corn Capacity System.

After 1783:

1 **hogshead** (for lime) = 100 gal.

For coal and salt after 1830

			Metric
chaldron			73,155.422 976 kg
12	tub		6096.285 248 kg
48	4	bushel	1524.071 312 kg

101.4.4 Newfoundland (1832–1900)

In 1834, adopted the Imperial Dry Capacity System.

After 1834:

3 bushels = 2½ heaped bushels;

1 **hogshead** (for coal) = 63 gal.

After 1896:

1 **barrel** (for fresh herring) = 32 gal.

101.4.5 Nova Scotia (1758–1867)

In 1758, adopted the William III Winchester Corn Capacity System.

After 1762:

1 **barrel** (for pickled fish) = 31½ gal.

After 1789:

1 **tierce** (for salmon) = 42 gal;

1 **barrel** (for pickled fish) = 30 gal.

After 1792:

1 **hogshead** (for lime) = 96 gal. = 8 heaped bu.

After 1794:

1 **barrel** (for beef and pork) = 30–31 gal.

After 1828:

For pickled fish after 1798

half barrel			
2	quarter barrel		
4	2	eighth barrel	
16	8	4	gallon

1 **tierce** (for pickled fish) = 45–46 gal;

1 **barrel** (for pickled fish) = 29–30 gal;

1 **half barrel** (for pickled fish) = 15 gal.

After 1830:

1 **barrel** (for beef and pork) = 27–28 gal;

1 **half barrel** (for beef and pork) = 14–15 gal.

101.4.6 Prince Edward Island (1773–1873)

In 1795, adopted the William III Winchester Corn Capacity System.

After 1833:

1 **bushel** (for potatoes and turnips) = 3 bushels = 2½ heaped bushels.

After 1841:

1 **bushel** (for potatoes and turnips) = 2½ bushels = 2 heaped bushels.

After 1846:

1 **barrel** (for lime) = 3 bushels.

After 1856:

1 **bushel** (for edible roots) = 2¾ bushels = 2 heaped bushels.

101.4.7 Upper Canada (1791–1867)

In 1792, adopted the William III Winchester Corn Capacity System.

101.4.8 Province of Canada (including Lower and Upper Canada) (1848–1867)

After 1859:

1 **chaldron** (for coal) = 36 bu.

101.4.9 Dominion of Canada (1867–1900)

In 1871, adopted the Metric Dry and Liquid Capacity System, with the exception of the millimetre and the huitime.

In 1873, adopted the Imperial Dry Capacity System.

Until 1880, the bushel of the William III Winchester Corn Capacity System was permitted to be used.

After 1879:

1 **barrel** = 25 gal.

101.5 Units of Liquid Capacity

101.5.1 British Columbia (1858–1871)

In 1867, adopted the Imperial Liquid Capacity System.

101.5.2 Lower Canada (1663–1867)

In 1799, adopted the Queen Anne Winchester Wine Gallon System.

101.5.3 New Brunswick (1784–1867)

In 1786, adopted the Queen Anne Winchester Wine Gallon System.

101.5.4 Newfoundland (1832–1900)

In 1834, adopted the Imperial Liquid Capacity System.

101.5.5 Nova Scotia (1758–1867)

In 1758, adopted the Queen Anne Winchester Wine Gallon System.

101.5.6 Prince Edward Island (1773–1873)

In 1795, they adopted Queen Anne Winchester Wine Gallon System.

101.5.7 Upper Canada (1791–1867)

In 1792, adopted the Queen Anne Winchester Wine Gallon System.

101.5.8 Province of Canada (Including Lower and Upper Canada) (1848–1867)

Continued use of Queen Anne Winchester Wine Gallon System.

101.5.9 Dominion of Canada (1867–1900)

In 1871, adopted the *Système métrique français* de capacité pour les matières sèches et les liquides, with the exception of the millilitre and the huitime.

In 1873, adopted the Imperial Liquid Capacity System.

Until 1880, the gallon of the Queen Anne Winchester Wine Gallon System was permitted to be used.

1 **minot** = 39.025 L or 38 910 L.

101.6 Units of Weight

Canada 1951 453.592 43 g, so 1 kg = 2.204 622 33~lb. Canada: An Act respecting Weights and Measures assented to on June 20, 1951.

101.6.1 British Columbia (1858–1871)

In 1867, adopted the Avoirdupois Pound Weight System, the Troy Pound Weight System and the Apothecary Weight System.

101.6.2 New Brunswick (1784–1867)

In 1786, adopted the Avoirdupois Pound Weight System and the Troy Pound Weight System.

After 1803:

1 **firkin** (for butter) = 60 lbs av.

After 1833:

1 **ton** (for coal) = 2000 lbs av;

1 **bushel** (for Indian corn and wheat) = 60 lbs av;

1 **bushel** (for edible roots and rye) = 56 lbs av;

1 **bushel** (for barley and buckwheat) = 50 lbs av;

1 **bushel** (for timothy seed) = 40 lbs av;

1 **bushel** (for oats) = 36 lbs av;

After 1866:

1 **hundredweight** = 100 lbs av;

1 **ton** = 200 lbs av.

							Imperial	Metric
boisseau							8 gal	36.368 L
4	quart						2 gal	9.092 L
16	4	demi-gallon					2 qt	2.273 L
32	8		pinte				1 qt	1.136 52 L
64	16	4		chopine			1 pt	568.261 2 mL
128	32	8	4	2	demiard		½ pt	284.130 6 mL
256	64	16	8	4	2	roquille	1 gill	142.065 3 mL

101.6.3 Newfoundland (1832–1900)

In 1834, adopted the Avoirdupois Pound Weight System and the Troy Pound Weight System.

After 1844:

- 1 **ton** (for coal) = 2240 lbs av;
- 1 **barrel** (for beef, jowls and pork) = 200 lbs av;
- 1 **barrel** (for corn, flour and oatmeal) = 196 lbs av;
- 1 **bag** (for biscuits) = 112 lbs av;
- 1 **half-barrel** (for beef, jowls and pork) = 100 lbs av;
- 1 **half-barrel** (for corn, flour and oatmeal) = 98 lbs av;
- 1 **bushel** (for beans, peas, wheat and edible roots) = 60 lbs av;
- 1 **bushel** (for Indian corn) = 57 lbs av;
- 1 **bushel** (for rye) = 56 lbs av;
- 1 **half-bag** (for biscuits) = 56 lbs av;
- 1 **bushel** (for flax seed) = 50 lbs av;
- 1 **bushel** (for barley) = 48 lbs av;
- 1 **bushel** (for hemp seed) = 44 lbs av;
- 1 **bushel** (for oats) = 38 lbs av;

101.6.4 Lower Canada (1663–1867)

In 1799, adopted the Avoirdupois Pound Weight System and the Troy Pound Weight System.

For coal after 1836

ton		
20	hundredweight	
2240	1120	avoirdupois pounds

101.6.5 Nova Scotia (1758–1867)

In 1758, adopted the Avoirdupois Pound Weight System and the Troy Pound Weight System.

After 1792:

- 1 **bushel** (for peas) = 60 lbs av;
- 1 **bushel** (for Indian corn and wheat) = 58 lbs av;
- 1 **bushel** (for rye) = 56 lbs av;
- 1 **bushel** (for barley) = 48 lbs av;
- 1 **bushel** (for oats) = 34 lbs av;

After 1794:

- 1 **barrel** (for beef and pork) = 200 lbs av;
- 1 **half-barrel** (for beef and pork) = 100 lbs av.

For flour and meal after 1796:

sack		
2	hundredweight or quarter	
280	140	avoirdupois pound

After 1850:

- 1 **barrel** (for flour and meal) = 196 lbs av;
- 1 **half-barrel** (for flour and meal) = 98 lbs av;

After 1864:

- 1 **ton** = 2000 lbs av;
- 1 **hundredweight** = 100 lbs av.

101.6.6 Prince Edward Island (1773–1873)

In 1795, adopted the Avoirdupois Pound Weight System and the Troy Pound Weight System.

After 1837:

- 1 **bushel** (for beans and peas) = 60 lbs av;
- 1 **bushel** (for wheat) = 58 lbs av;
- 1 **bushel** (for Indian corn) = 57 lbs av;
- 1 **bushel** (for rye) = 56 lbs av;
- 1 **bushel** (for barley) = 48 lbs av;
- 1 **bushel** (for oats) = 36 lbs av.

After 1869:

- 1 **bushel** (for potatoes) = 65 lbs av;
- 1 **bushel** (for beets, carrots and turnips) = 60 lbs av;
- 1 **bushel** (for parsnips) = 56 lbs av.

101.6.7 Upper Canada (1791–1867)

In 1792, adopted the Avoirdupois Pound Weight System and the Troy Pound Weight System.

After 1865:

- 1 **bushel** (for clover seed, peas, timothy seed and wheat) = 60 lbs av;
- 1 **bushel** (for Indian corn and rye) = 56 lbs av;
- 1 **bushel** (for beans) = 50 lbs av;
- 1 **bushel** (for barley) = 48 lbs av;
- 1 **bushel** (for oats) = 34 lbs av.

After 1853:

- 1 **bushel** (for beans) = 60 lbs av;
- 1 **bushel** (for buck-wheat seed and timothy seed) = 48 lbs av.

101.6.8 Province of Canada (including Lower and Upper Canada) (1848–1867)

After 1859:

- 1 **ton** = 2000 lbs av;
- 1 **hundredweight** = 100 lbs av;
- 1 **bushel** (for Indian corn, salt and rye) = 60 lbs av;
- 1 **bushel** (for flax seed) = 50 lbs av;
- 1 **bushel** (for barley, buckwheat and timothy seed) = 48 lbs av;
- 1 **bushel** (for hemp seed) = 44 lbs av;
- 1 **bushel** (for castor beans) = 40 lbs av;
- 1 **bushel** (for malt) = 36 lbs av;
- 1 **bushel** (for oats) = 34 lbs av;
- 1 **bushel** (for dried peaches) = 33 lbs av;
- 1 **bushel** (for dried apples) = 22 lbs av;
- 1 **bushel** (for blue grass seed) = 14 lbs av;

After 1860:

- 1 **ton** (for clover, timothy and straw) = 2000 lbs av;
- 1 **bundle** (for clover, timothy and other hay with a withe band) = 16 lbs av;
- 1 **bundle** (for clover, timothy and other hay with a timothy band) = 15 lbs av;
- 1 **bundle** (for straw) = 12 lbs av.

101.6.9 Dominion of Canada (1867–1900)

In 1871, adopted the Metric Weight System (the metric ton was called a millier).

In 1873, adopted the Avoirdupois Pound Weight System and the Troy Pound Weight System.

After 1873:

- 1 **bushel** (for beans, clover seed, edible roots, peas and wheat) = 60 lb av;
- 1 **bushel** (for Indian corn, salt and rye) = 56 lbs av;
- 1 **bushel** (for flax seed) = 50 lbs av;
- 1 **bushel** (for barley, buckwheat and timothy seed) = 48 lbs av;
- 1 **bushel** (for hemp seed) = 44 lbs av;
- 1 **bushel** (for castor beans) = 40 lbs av;
- 1 **bushel** (for malt) = 36 lbs av;
- 1 **bushel** (for oats) = 34 lbs av;
- 1 **bushel** (for dried peaches) = 33 lbs av;
- 1 **bushel** (for dried apples) = 22 lbs av;
- 1 **bushel** (for blue grass seed) = 14 lbs av.

After 1885:

- 1 **bushel** (for bituminous coal) = 70 lbs av.

After 1886:

- 1 **bundle** (for clover and timothy with a withe band) = 16 lbs av;
- 1 **bundle** (for clover and timothy with a timothy band) = 15 lbs av;
- 1 **bundle** (for straw) = 12 lbs av.

British Imperial-linked system

			Imperial	Metric
tonneau or ton			1 short ton	907.184 74 kg
20	cent, cental, or quintal		1 hundredweight	45.359 237 kg
2000	100	livre	1 pound av.	453.592 37 g

101.7 Berens River Ojibwe-speaking people in Manitoba

101.7.1 Units of Length

- 1 **pejigonik** = the distance between the tips of the fingers when both arms are stretched out;
- 1 **pejiwákwagon** = the distance between the thumb and the tip of the middle finger.

102 Canary Islands

See also *Spain*.
The Castilian system for weights and measures was mainly used until 1859.
Main sources: [ALCU], [COLL2], [KELL], [LABR], and [MART3]

102.1 Currency

- 1 peso Corrente = 8 reales de Plata = 10 reales Correntes = 128 quartos
- 1 peso Fuerte = 1⅓ peso Corrente = 10⅓ reales de Plata = 20 reales vellon = 170 quartos = 680 maravedis vellon

102.2 Units of Length

Castilian system and system based on [KELL]

						Metric	Metric
brazado						1.811 127 m	1.836 9 m
2⅙	vara					835.900 mm	847.800 mm
6½	3	pié				287.635 mm	282.600 mm
8⅔	4	1⅓	palmo			208.976 mm	211.950 mm
78	36	12	9	pulgada		23.219 mm	23.550 mm
936	432	144	108	12	línea	1.935 mm	1.962 mm

At Las Palmas de Gran Canaria

					Metric
vara					841.800 mm
3	pié				280.600 mm
4	1⅓	palmo			210.450 mm
36	12	9	pulgada		23.383 mm
432	144	108	12	línea	1.949 mm

System reported during the late nineteenth century

				Metric
braza				1.683 m
2	vara			841.55 mm
6	3	pié		280.52 mm
72	36	12	onza	23.38 mm

102.3 Units of Area

For vineyards and corn lands

				Metric
fanegada				5 248.292 5 m ²
2	media fanegada			2 624.146 2 m ²
12	6	almude		437.357 71 m ²
1600	266⅔	133⅓	braza cuadrada	3.280 183 m ²

102.4 Units of Dry Capacity

At Las Palmas de Gran Canaria and Guía de Isora

					Metric	Metric
cahiz					792.000 000 L	817.920 L
12	fanega ^a				66.000 000 L	68.160 L
144	12	almud			5.500 000 L	5.680 L
576	48	4	cuartille		1.375 000 L	1.420 L
2 304	192	16	4	ochavo	343.750 mL	355.0 mL

1 **fanega** (heaped for grain) = 90.92 L, and 1 **fanega** (stricken for other cereals and salt) = 64.64 L
^aFor duty = 68.160 L. [KELL] reported that grain were sold by heaped measures, but other cereals and salt were sold in stricken measures

102.5 Units of Liquid Capacity

At Guía de Isora

			Metric
almud			4.96 L
2	medio almud		2.48 L
5	2½	cuartillo	995 mL

At Las Palmas de Gran Canaria

					Metric
pipa					512.640 000 L
12	barril				42.720 000 L
96	8	arroba			5.340 000 L
480	40	5	cuartillo		1.068 000 L
1920	160	20	4	cuarta	267.000 mL

At Santa Cruz de Tenerife

		Metric
arroba		5.08 L
48	cuartillo	105.8 mL

Other reported measures:
1 **cuartillo** (at Arrecife de Lanzarote) = 2.46 L.

102.6 Units of Weight

							Metric
quintal							46.009 3 kg
4	aroba						111.502 3 kg
50	12½	libra doble					920.186 g
100	25	2	libra				460.093 g
1600	400	32	16	ounce			28.756 g
25,600	6400	512	256	16	adarme		1.797 g
614,400	153,600	12,288	6144	384	24	grain	74.9 mg

103 Kingdom of Candia

See also *Crete*.
In 1204, after the Fourth Crusade, Crete was divided amongst the crusade leaders. The Kingdom ended in 1669, after the Ottoman conquest of Crete.

104 Canton and Enderbury Islands

See *Kiribati*.

105 Cape Colony

See also *Orange Free State* and *Orange River Colony*.
In 1652, the Dutch East India Company established Cape Town. It was occupied by the British in 1795. Between 1803 and 1806, the colony was under control of the Batavian Republic. In 1910, the Cape Colony united with three other colonies to form the Union of South Africa.

106 Cape Verde [Formerly: Cape Verde Islands]

The Portuguese first settled Cape Verde in 1462. Cape Verde became an overseas province in 1951 and independent in 1975.

The metric system has been official since 1891.

Main sources: [ECON], [SENN], [UN55], and [UN66]

106.1 Currency

1911–: 1 Cape Verdean escudo = 100 centavos

1865–1914: 1 Cape Verdean real (= 1 Portuguese real)

106.2 Units of Length

					Metric
linhada					22 m
5	lança				4.4 m
10	2	braça			2.2 m
20	4	2	vara		1.1 m
25	5	2½	1¼	jarda	0.88 m

Other reported measures:

1 pé = 1 Imperial foot = 0.304 8 m.

106.3 Units of Area

							Metric
alqueres							185.856 a
4	quarta						46.464 a
8⅞ ₁₅	2⅞ ₁₅	casel					21.78 a
16	4	1⅞ ₂₄	onça				11.616 a
960	240	112½	60	lança quadrada			0.193 6 a
3840	960	450	240	4	braça quadrada		4.84 m ²
15,360	3840	1800	960	16	4	vara quadrada	1.21 m ²

106.4 Units of Volume

1 **corda** (for wood) = 125 cu ft or 128 cu ft = 3.539 m³ or 3.624 m³

106.5 Units of Dry Capacity

				Metric
moio				2495.58 L
20	barrica			124.779 L
60	3	alqueire		41.593 L
240	12	4	quarta	10.398 L

106.6 Units of Liquid Capacity

					Metric
galão					3.675 L
1½	frasco				2.45 L
2⅞	1¾	canada			1.4 L
3½	2⅞	1⅓	folha		1.05 L
5¼	3½	2	1½	garrafa	0.7 L

106.7 Units of Weight

		Metric
pedra		1.377 kg
3	libra or arratel	459 mg

107 Caribbean Netherlands

See *Netherlands Antilles*.

108 Kingdom of Castile (1037–1230)

See also *Crown of Castile*, *Kingdom of León*, and *Spain*.

The Kingdom was established in 1037. In 1230, Ferdinand III of Castile received the Kingdom of León. Along with taifas conquered from the Moors, those areas then formed what became known as the Crown of Castile.

109 Cayman Islands [Formerly: Tortugas]

The Cayman Islands were discovered by Christopher Columbus in 1503, and originally named Tortugas. The islands, along with Jamaica, were captured from the Spanish Empire, they were then ceded to Britain as the Cayman Islands in 1670. They were governed as a single crown colony with Jamaica until 1962, when the Cayman Islands became a separate British Overseas Territory.

109.1 Currency

- 1972–: 1 Cayman Islands dollar = 100 cents
- 1969–1971: 1 Jamaican dollar = 100 cents
- 1920–1969: 1 Jamaican pound = 20 shillings = 240 pence
- 1840–1920: 1 pound sterling = 20 shillings = 240 pence

110 Central African Republic [Formerly: Haut Ubangi, Ubangi-Shari]

This area was under Egyptian control until 1889, when French colonization began. The French

colony of Haut Ubangi was established in 1894. The area had its name changed to Ubangi-Shari in 1903. It was united with Chad in late 1905, and cojoined with Chad, Middle Congo and Gabon in 1910 to form French Equatorial Africa. In 1958, it became the Central African Republic within the French Community. Complete independence was attained in 1960.

The metric system has been official since 1884, and compulsory since 1907.

Main source: [SAMA]

110.1 Currency

- 1960–: 1 Central African CFA Franc = 100 centimes
- 1945–1960: 1 CFA Franc = 100 centimes
1 p^âta = 5 CFA Franc
- 1917–1945: 1 French Equatorial African franc = 100 centimes
- 1920: 1 Maria Theresa Thaler

110.2 Units of Quantity

- 1 s^ängi = a bunch of bananas;
- 1 s^ängi bul^êε = a bunch of sweet bananas;
- 1 s^ängi f^önd^ö = a bunch of plantains.

110.3 Units of Length

British Imperial-linked system (names in Sango)

			Metric
kpu			1609.344 m
1760	y ^ä ti gbagba or y ^ä r ^ä de ^a		914.4 mm
5280	3	gerê	304.8 mm

^aOften used for textiles

Metric system (names in Sango)

					Metric
sâkimêtere					1000 m
1000	mêtere				1 m
10,000	10	nzîna-mêtere			1 dm
100,000	100	10	zegbɛ-mêtere		1 cm
1,000,000	1000	100	10	yakêrê-mêtere	1 mm

110.4 Units of Area

Metric system for agricultural areas

			Metric
ngbö			10,000 m ²
100	tukia		100 m ²
10,000	100	mêtere karëë	1 m ²

110.5 Units of Capacity

British Imperial-linked system

			Metric
boisseau			36.348 656 L
8	gallon		4.543 582 L
64	8	pinte	567.948 mL

Metric system (names in Sango)

						Metric
sâkilîtiri						1000 L
100	sûi-lîtiri					10 L
1000	10	lîtiri				1 L
10,000	100	10	nzîna-lîtiri			1 dL
100,000	1000	100	10	zegbɛ-lîtiri		1 cL
1,000,000	10,000	1000	100	10	yakêrê-lîtiri	1 mL

Other reported measures:

- 1 **fû** = a handful;
- 1 **papa** = a spoonful.

110.6 Units of Weight

British Imperial-linked system

			Metric
tonneau or ton			907.184 74 kg
20	cental, or quintal		45.359 237 kg
2000	100	livre or pound	453.592 37 g

Metric system (names in Sango)

						Metric
sâkikilöö						1000 kg
1000	kilöö or sâkigarâmo					1 kg
1,000,000	1000	garâmo				1 g
10,000,000	10,000	10	nzîna-garâmo			100 mg
100,000,000	100,000	100	10	zegbɛ-garâmo		10 mg
1,000,000,000	1,000,000	1000	100	10	yakêrê-garâmo	1 mg

111 Central American Federal Republic

See also *Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua.*

The United Provinces of the Center of America, called the Federal Republic of Central America from 1824, was established in 1823. The republic consisted of the states of Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica. An additional sixth state, Los Altos, was added in the 1830s. After the member states began gradually to secede, the Federation was dissolved by 1840.

112 Central Asia [Formerly: Transoxiana]

See also *Afghanistan, Iran, Kazakhstan, Turkmenistan, and Uzbekistan.*

For several centuries prior to 1500, no single dynasty was able to control the region previously known as Transoxiana. Then, the area became the domain of the Shaybanids, followed by the Janids. At their greatest extent, the dynasties took in northern Persia and Afghanistan, as well as parts of present-day Kazakhstan, Kyrgystan, Tajikistan, Turkmenistan, and Uzbekistan.

113 Ceylon

See *Sri Lanka.*

114 Chad

In 1883–1893, the three kingdoms of Kanem-Bornu, Baguirmi, and Ouaddai came under the rule of the Sudanese conqueror Rabeh al-Zubayr (c. 1842–1900), the last of the Africans to oppose French conquest. When he was defeated in mid-1900, the area was organized as a colony. By 1920, France had incorporated all three former kingdoms into the colony of French Equatorial Africa, as part of Oubangi-Shari. Kanem-

Bornu was split between the French, Germans and British, while Baguirmi was split between the Germans and French. Chad was part of French Equatorial Africa until it became a republic and gained its autonomy in 1958. It became a fully independent republic in 1960.

The traditional systems for weights and measures were mainly influenced by the Arabic system. Some British Imperial units of measure were reported in use during the early twentieth century. The metric system has been official since 1884, and compulsory since 1907.

Main source: [IIC]

114.1 Currency

- 1960–: 1 Central African CFA Franc = 100 centimes
- 1917–1960: 1 French Equatorial African franc = 100 centimes
- 1920: 1 Maria Theresa Thaler

114.2 Units of Length

British Imperial-linked system

				Metric
mille				1609.344 m
1760	verge			914.4 mm
5280	3	pied		304.8 mm
63,360	36	12	pouce	25.4 mm

Other reported measures for cloth and fabrics:

- 1 guz = 644 mm;
- 1 dhraa = 488 mm.

114.3 Units of Area

Some reported measures:

- 1 feddan = the area that could be tilled by a yoke of oxen in a day.

114.4 Units of Weight

British Imperial-linked system

			Metric
tonneau			907.184 74 kg
20	cental		45.359 237 kg
2000	100	livre	453.592 37 g

Other reported measures:

1 **kantar** = about 45 kg.

115 Chagatai Khanate (1225–1687)

In 1225, Chagatai Khan inherited a part of the Mongol Empire. Transoxania was captured by Tamerlane in 1370. In 1687, the remaining domains fell to ApaQ Khoja and Ak Tagh.

116 Eastern Chalukyas (624–1189)

See *India*.

117 Western Chalukya Empire (973–1189)

See *India*.

118 Chera Kingdom (c. 500 BC–1102)

See *Tamilakam*.

118.1 Chile

Northern Chile was explored in 1535–36 by the Spanish army. Prior to this, the area was under

Incan rule. Central and Southern Chile was inhabited by the Mapuche cultures. Chile was administered from the viceroyalty of Peru until 1776, and by Vice-Royalty of Peru from 1776, before gaining its independence in 1818.

The system of weights and measures has been influenced by the old Spanish systems and the U.S. customary systems. These systems were used until the early twentieth century. The metric system has been official since 1848 and compulsory since 1865.

Main sources: [MART3], [UN55], and [UN66]

e-mail source: [eTAUB]

118.2 Currency

1975–: 1 Chilean peso = 100 centavos
1960–1975: 1 Chilean escudo = 100 centésimos
1851–1960: 1 Chilean peso = 100 centavos
1817–1851: 1 Chilean escudo = 2 pesos = 16 reales
1749–1818: 1 Spanish escudo = 2 pesos = 16 reales

118.3 Units of Length

Traditional measures:

1 **legua** (until the early eighteenth century) = the distance a man can walk in an hour = ~5500 m.

Old customary system

		Metric
legua antigua		5565.001 2 m
242,000	pulgada	22.995 872 mm

Spanish system

									Metric
legua or league									4513.860 m
36	cuadra ^a								125.385 m
1350	37½	estadal							3.343 7 m
2700	75	2	braza or toesa						1.671 6 m
5400	150	4	2	vara					835.905 mm
16,200	450	12	6	3	pié				278.635 mm
194,400	5400	144	72	36	12	pulgada			23.220 mm
2,332,800	64,800	1728	864	432	144	12	linea		1.935 mm
27,993,600	777,600	20,736	10,368	5184	1728	144	12	punto	161.25 µm

^aThe length of one side of a city block

U.S. customary system

			Metric
milla			1609.344 m
5280	pie		304.8 mm
63,360	12	pulgada	25.4 mm

Other reported measures:

1 **pi:nush** (used by the Yaghan people of Tierra del Fuego) = an armspan.

118.4 Units of Area

Customary system

								Metric
cuadra								15,725.16 m ²
cuadrada ^a								
2 ^{1017/2304}	fanega or fanegada ^a							6441.025 5 m ²
29 ^{19/64}	12	celemin						536.752 125 m ²
117 ^{3/16}	48	4	cuartillo					134.188 031 m ²
1406¼	576	48	12	estadal cuadrada				11.182 336 m ²
22,500	9216	768	192	16	vara cuadrada			698.896 dm ²
202,500	82,944	6912	1728	144	9		pié cuadrada	77.655 dm ²

^aTraditional land measures

In Comana, based on [WALK, p. 69]

		Metric
fanega		20,754 m ²
28,900	vara cudrada	71.81 dm ²

Other measures reported during the nineteenth century:

1 **caballería** = 13.403 ha.

118.5 Units of Volume

Customary system

			Metric
tuesa cubico			4.674 216 m ³
8	vara cubico		584.277 dm ³
216	27	pié cubico	21.640 dm ³

Other measures reported during the nineteenth century:

1 **pulgada maderera** (for timber) = 1 in x 10 in x 12 f. = 25.4 mm x 254 mm x 3.66 m = 23.597 dm³.

118.6 Units of Dry Capacity

For cereals

			Metric
fanega			97 L
12	almude		8.083 3 L
48	4	cuartille	2.020 83 L

In Concepción

			Metric
fanega^a			105.875 L
12	almude		8.823 L
48	4	cuartille	2.206 L

^aWheat, rye, beans, peas, and lentils were also, according to [MART3], sold by the hectolitre

118.7 Units of Liquid Capacity

Customary system

			Metric
galón			4.546 L
5	botella		909.2 mL
8	1⅓	pinta	568.3 mL

Spanish system

								Metric
tonnelada								920.186 kg
20	quintal							46.009 kg
80	4	arroba						11.502 kg
2000	100	25	libra					460.093 g
32,000	1600	400	16	onza				28.756 g
200,000	10,000	2500	100	6¼	castellano			4.601 g
512,000	25,600	6400	256	16	2¼ ₂₅	adarme^a		1.797 24 g
1,536,000	76,800	19,200	768	48	7¼ ₂₅	3	tomin^a	599.04 mg
18,432,000	921,600	230,400	9216	576	92¼ ₂₅	36	12	grano^a 49.92 mg

^aUsed for gold and silver

In southern, northern, and central Chile

			Metric	Metric	Metric
arroba			32.272 L	35.552 L	40 L
16	azumbre		2.017 L	2.222 L	2.5 L
64	4	cuartillo	504.25 mL	1.111 L	625 mL

Imperial system

				Metric
pipa				227.118 6 L
3⅓	barril			68.135 58 L
6⅔	2	arroba		34.067 79 L
60	18	9	gallon	3.785 31 L

118.8 Units of Weight

Other measures reported during the nineteenth century:

1 **quintal** (for wheat flour in Concepción) = 46 kg;
1 **arroz** (a grain of rice) = 36 mg.

US customary system

								Metric
tonnelada								1016.048 kg
1 ¹⁰¹ / ₁₄₄	libra							597.188 g
3 ²⁹ / ₇₂	2	marca						298.594 g
27⅔	16	8	onza					37.324 g
217⅞	128	64	8	ochavo				4.665 g
435⅞	256	128	16	2	adarme			2.333 g
1306⅞ ₃	768	384	48	6	3	tomine		777.588 mg
15,680	9216	4608	576	72	36	12	grano	64.799 mg

Other measures reported during the early twentieth century:

1 **bag** (for nitrate) = 86 kg.

Upper scale with rounded values

							Metric
cajon							2944 kg
3⅓	tonnelada^a						920 kg
21⅓	6⅔	carga					138 kg
42⅔	13⅓	2	quintal macho				69 kg
64	20	3	1½	quintal			46 kg
256	80	12	6	4	arroba		11.5 kg
6400	2000	300	150	100	25	libra	460 g

^aUsed for guano

Lower scale with rounded values

							Metric
libra							460 g
2	marco						230 g
16	8	onza					28.75 g
128	64	8	ochava				3.593 75 g
256	128	16	2	adarme			1.796 88 g
768	384	48	6	3	tomin		598.96 mg
9216	4608	576	72	36	12	grano	49.91 mg

Metric-linked system

			Metric
ton			1000 kg
10	quintal métrico		100 kg
1000	100	libra métrico	1 kg

119 China

See also *Hong Kong, Laos, Macau, Manchukuo, Mongolia, Paracel Islands and Taiwan.*

By the 1000 century BCE, China already consisted of many small kingdoms. All of these were brought under one emperor in 221 BCE, during the Qin Dynasty, but by 220 CE, that unity had been lost. China was reunited by the Sui Dynasty in 581, but in 907, it was again split into smaller states. Under the Sung Dynasty, China was reunited beginning in 960. In 1226, the invasion of the Junchen divided China once

again, but the Yuan Dynasty (Mongols) ruled the entire country from 1279. In 1368, China was re-established as a nation by a native dynasty, the Ming Dynasty. In 1912, the Chinese Emperor was deposed and the Republic of China was proclaimed.

A minor change in the ancient measurement system was made in 1662, during the Qing Dynasty, by the Kangxi Emperor. The system of units of Imperial China (Chinese: 市制, Shìzhì = “Market Standard”) was used parallel to the metric system in modern China and was related to the Japanese Shakkanhō. The prefix 市, shì = “market town”, was used to avoid confusion with the same metric units (where appropriate, prefixed, 公 gong = “standard”). The metric system became legally optional in 1903. In 1908, national units were defined by metric equivalents. A new system based on the metric system was legally adopted on February 16, 1929. The SI was adopted in 1984 and became the national standard in 1987.

Main sources: [CHEN], [CHIU2], [FERG2], [GUO], [IWAT4], [JUN], [KUOC], [LOEW], [MART3], [MORS], [NEED], [QIU], [RENN], [SCHI3], [UN55], [UN66], [VOGE], [VOGE2], [VOGE3], and [WU]

119.1 Currency

1949–: 1 yuan renminbi = 10 jiǎo = 100 fēn
1897–1949: 1 yuan = 10 jiǎo = 100 fēn = 1 000 wén
666–1897: 1 tael = 10 mace = 100 candareen
–666: 1 tael = 2 bànliǎng = 24 zhū
1 wǔ zhū = 5 zhū

119.2 Units of Length

119.2.1 Míng Dynasty (1368–1644 CE)

Scale according to Prof. Qiu Guangming

丈	尺	寸	分	厘	毫
zhàng					
10	chǐ				
100	10	cùn			
1000	100	10	fēn		
10,000	1000	100	10	lí	
100,000	10,000	1000	100	10	háo

According to [SCHI3, p. 421]

		Metric
lǐ		451.20–478.50 m
1500	chǐ	300.8–319.0 mm

119.2.2 Qíng Dynasty (1644–1911 CE)

System according to Prof. Qiu Guangming

市里	市丈	步	市尺	市寸	市分	市厘	毫	丝	Metric
lǐ ^a									599.999 m
180	zhàng								3.333 m
360	2	bù							1.667 m
1800	10	5	chǐ						3.333 dm
18,000	100	50	10	cùn					333.3 mm
180,000	1000	500	100	10	fēn				3.333 mm
1,800,000	10,000	5000	1000	100	10	lí			333.3 μm
18,000,000	100,000	50,000	10,000	1000	100	10	háo		33.3 μm
180,000,000	1,000,000	500,000	100,000	10,000	1000	100	10	sī	3.3 μm

According to [SCH13, p. 421]

	Metric
lǐ	462.00–503.89 m
chǐ	300.8–335.2 mm

When Shih Huang-ti unified the empire, he chose the number 6 as his emblem (represented by the colour black and the element of water). But although the pu was fixed at 6 chhih, the principal measures of length below the chhih were henceforward arranged in powers of 10.

chǐ					
10	cùn				
100	10	fēn			
1000	100	10	lí		
10,000	1000	100	10	fa	
100,000	10,000	1000	100	10	hào

System as devised by the Kangxi Emperor after 1662

							Metric
thsan							46,080 m
8	pōu						5760 m
80	10	lǐ					576 m
14,400	1800	180	zhàng				3.2 m
28,800	3600	360	2	bù			1.6 m
144,000	18,000	1800	10	5	chǐ		320 mm
1,440,000	180,000	18,000	100	50	10	cùn	32 mm

In Guangzhou and present-day Beijing, based on [MART3]

									Metric
tu									111,120.622 222 m
4%	cheng								26,668.949 333 m
250	60	lí							44.482 489 m
4500	1080	18	yín						24.693 472 m
45,000	10,800	180	10	zhàng					2.469 347 m
90,000	21,600	360	20	2	bù				1.234 674 m
450,000	108,000	1800	100	10	5	chǐ			246.935 mm
4,500,000	1,080,000	18,000	1000	100	50	10	cùn		24.693 mm
45,000,000	10,800,000	180,000	10,000	1000	500	100	10	fēn	2.469 mm

In Shanghai, based on [MART3]

						Metric
tsong-ming-i-chĩ ^a						397.889 mm
–	hae-cuan-chĩ ^b					358.100 mm
–	–	fu-chian-i-chĩ ^c				318.311 mm
–	–	–	lu-pan-chĩ ^d			278.522 mm
10	9	8	7	cùn		39.789 mm
100	90	80	70	10	fēn	3.979 mm

^aFor timber and construction materials. Also spelled **vai-chĩ**

^bFor customary use. Also spelled **chiu-cùn-chĩ**

^cFor shopkeepers and local traders- Also spelled **pa-cùn-chĩ**

^dFor rope-makers, carpenters and masons. Also spelled **mu-tsciang-chĩ** and **tsi-tsun-chĩ**

Other reported measures in Shanghai during the nineteenth century:

1 **meh** = 1 English yard = 914.392 mm;

1 **Shanghai tsai-chĩ** = 354.000 mm.

System used in a customs treaty with Britain (after 1858)

							Metric
lǐ (=2 115 ft)							644.652 m
18	yǐn						35.814 m
180	10	zhàng					3.581 4 m
360	20	2	bù				1.790 7 m
1800	100	10	5	chǐ ^a			358.14 mm
18,000	1000	100	50	10	cùn		35.814 mm
180,000	10,000	1000	500	100	10	fēn	3.581 4 mm

^aIn Xiamen, reported as 359.2 mm

Metric-linked system in 1903

							Metric
sin lǐ							1 km
10	sin yǐn						100 m
100	10	sin zhàng					10 m
1000	100	10	sin chǐ				1 m
10,000	1000	100	10	sin tshwen			1 dm
100,000	10,000	1000	100	10	sin fēn		1 cm
1,000,000	100,000	10,000	1000	100	10	sin lí	1 mm

System used by engineers before 1908

			Metric
po			1.531.8 m
3/4	thuoc		483.72 mm
4/4	1½	chik	322.48 mm

System used by tradesmen before 1908

			Metric
thuoc			650.14 mm
1¾	covid or cobre		371.51 mm
17½	10	punt	37.15 mm

National upper system defined by metric equivalents in 1908

									Metric
tou									144 km
3⅞	thsan								46.08 km
25	8	poû							5 760 m
250	80	10	lǐ						576 m
1500	480	60	6	kyo					96 m
3750	1200	150	15	2½	fēn				38.4 m
4500	1440	180	18	3	1⅙	yín or yán			32 m
45,000	14,400	1800	180	30	12	10	zhàng		3.2 m
90,000	28,800	3600	360	60	24	20	2	bù	1.6 m

National lower system defined by metric equivalents in 1908

								Metric
bù								1.6 m
5	chǐ							320 mm
50	10	cùn						32 mm
500	100	10	fēn					3.2 mm
5000	1000	100	10	lí				320 µm
50,000	10,000	1000	100	10		háo		32 µm
500,000	100,000	10,000	1000	100	10		hoé	3.2 µm

Other reported measures:

1 **tsai-fong-tsci** (at Ningbo) = 358.000 mm;

1 **cuan-tsai-tsci** (at Ningbo) = 348.000 mm;

1 **lu-pan-tsci** (at Nangbo) = 278.500 mm.

119.2.3 Republic of China (1912–1949)

Scale for domestic use as promulgated in 1915, according to Prof. Qiu Guangming

里	仞	丈	步	尺	寸	分	厘	毫/秒	Metric
lǐ									576 m
18	yǐn								32 m
180	10	zhàng							3.2 m
360	20	2	bù						1.6 m
1800	100	10	5	chǐ					320 mm
18,000	1000	100	50	10	cùn				32 mm
180,000	10,000	1000	500	100	10	fēn			3.2 mm
1,800,000	100,000	10,000	5000	1000	100	10	lí		0.32 mm
18,000,000	1,000,000	100,000	50,000	10,000	1000	100	10	háo or miǎo	32 µm

Upper scale in Gong zhi' system (standard metric system)

						Metric
gong lǐ						1 km
10	bei mǐ					100 m
100	10	shǐ' mǐ				10 m
1000	100	10	mǐ			1 m
10,000	1000	100	10	fēn mǐ		1 dm
100,000	10,000	1000	100	10	lǐ' mǐ	1 cm

Lower scale in Gong zhi' system (standard metric system)

						Metric
fēn mǐ						1 dm
10	lǐ mǐ					1 cm
100	10	hǎo mǐ				1 mm
1000	100	10	sǐ mǐ			100 µm
10,000	1000	100	10	hū mǐ		10 µm
100,000	10,000	1000	100	10	wei mǐ	1 µm

Upper scale in Shí zhí system (market system)

市里	引	市丈	步	市尺	市寸	Metric
lǐ						500 m
15	yǐn					33⅓ m
150	10	zhàng				3⅓ m
1500	100	10	bù			1⅓ m
75,000	500	50	5	chǐ		333⅓ mm
750,000	5 000	500	50	10	cùn	33⅓ mm

Lower scale in Shí zhí system (market system)

市寸	市分	市厘	毫	丝		Metric
cùn						33⅓ mm
10	fēn					3⅓ mm
100	10	lí				1/3 mm
1000	100	10	hǎo			33⅓ µm
10,000	1000	100	10	sī		3⅓ µm
100,000	10,000	1000	100	10	hū	1/3 µm

The gong scheme [Mandarin Pin-Yin; Mandarin Wade-Giles] after 1929

						Metric
gong lǐ or kung lǐ						1 km
10	gong yin or kung yin					100 m
100	10	gong zhang or kung chang				10 m
1000	100	10	gong chi or kung chi'ih			1 m
10,000	1000	100	10	gong cun or kung ts'un		1 dm
100,000	10,000	1000	100	10	fēn	1 cm

The shi scheme [Mandarin Pin-Yin; Mandarin Wade-Giles] after 1929

		丈				Metric
shi li or shih li						500 m
15	shi yin or shih yin					33.333 m
150	10	shi zhang or shih chang				3.333 m
1500	100	10	shi chi or shih chi'ih			3.333 dm
15,000	1000	100	10	shi cun or shih ts'un		3.333 cm
150,000	10,000	1000	100	10	fen	3.333 mm

Scale for domestic use after 1930, according to Prof. Qiu Guangming

里	仞	丈	尺	寸	分	厘	毫/秒	Metric
lǐ								500 m
15	yǐn							33⅓ m
150	10	zhàng						3⅓ m
1500	100	10	chǐ					33⅓ cm
15,000	1000	100	10	cùn				3⅓ cm
150,000	10,000	1000	100	10	fēn			3⅓ mm
1,500,000	100,000	10,000	1000	100	10	lí		1/3 mm
15,000,000	1,000,000	100,000	10,000	1000	100	10	háo or miǎo	33⅓ μm

Metric scale according to Prof. Qiu Guangming

公里	公引	公丈	公尺	公寸	公分	公厘	公毫	公丝	公忽	Metric
gōng lǐ										1000 m
10	gōng yǐn									100 m
100	10	gōng zhàng								10 m
1000	100	10	gōng chǐ							1 m
10,000	1000	100	10	gōng cùn						1 dm
100,000	10,000	1000	100	10	gōng fēn					1 cm
1,000,000	100,000	10,000	1000	100	10	gōng lí				1 mm
10,000,000	1,000,000	100,000	10,000	1000	100	10	gōng háo			100 μm
100,000,000	10,000,000	1,000,000	100,000	10,000	1000	100	10	gōng sī		10 μm
1,000,000,000	100,000,000	10,000,000	1,000,000	100,000	10,000	1000	100	10	gōng hū	1 μm

119.3 Units of Area

Scale as devised by the Kangxi Emperor after 1662

							Metric
qīng							6144 m ²
10	mǔ						614.4 m ²
100	10	fén					61.44 m ²
1000	100	10	lǐ				6.144 m ²
10,000	1000	100	10	háo			61.44 dm ²
100,000	10,000	1000	100	10	su		6.144 dm ²
1,000,000	100,000	10,000	1000	100	10	hoé	61.44 cm ²

In Guangzhou and present-day Beijing, based on [MART3]

								Metric
chīng or fu								67,440 m ²
100	mǔ							674.400 m ²
1000	10	fēn						67.440 m ²
10,000	100	10	lǐ					6.744 m ²
24,000	240	24	2⅔	pu				2.810 m ²
100,000	1000	100	10	4⅙	hao			67.440 dm ²
600,000	6000	600	60	25	6	zhang		11.240 dm ²
1,000,000	10,000	1000	100	41⅓	3⅔	1⅓	se ^a	6.744 dm ²

^aIn present-day Beijing, reported as 1/10 zhang = 1.124 dm²

In Shanghai (Cantonese; Mandarin PY) after 1858

				Imperial	Metric
ch'ing; qing				726 000 ft ²	67,448.0 m ²
100	mou; mu			1/6 acre = 7 260 ft ²	674.48 m ²
400	4	chuo		1 815 ft ²	168.62 m ²
6000	60	15	chang ² ; zhang ²	121 ft ²	11.24 m ²

Metric-linked system in 1903

			Metric
sin ching			1 ha
100	sin mǔ		1 a
10,000	100	sin li	0.01 a

National scale defined by metric equivalents in 1908

							毫	Metric
chīng				分				61,440 m ²
10	qīng							6144 m ²
100	10	mǔ						614.4 m ²
400	40	4	kish					153.6 m ²
1000	100	10	2½	fēn				61.44 m ²
10,000	1000	100	25	10	lí			6.144 m ²
14,000	1400	140	35	14	1⅔	pou ² or kung		4.389 m ²
100,000	10,000	1000	250	100	10	7⅞	háo	0.614 4 m ²

Metric scale promulgated in 1915

顷	亩	分	厘	毫	Metric
qīng					6144 m ²
10	mù				614.4 m ²
100	10	fēn			61.44 m ²
1000	100	10	lí		6.144 m ²
10,000	1000	100	10	háo	0.614 4 m ²

Chinese square units effective in 1915

方丈	方尺	方寸	Metric
fāng zhàng			10.24 m ²
10	fāng chǐ		10.24 dm ²
100	10	fāng cùn	10.24 cm ²

For general use in Gong zhi' system (standard metric system)

				Metric
fan gong lí				1 km ²
1,000,000	fan mǐ			1 m ²
10,000,000,000	10,000	fan lí' mǐ		1 cm ²
1,000,000,000,000	1,000,000	100	fan hao mǐ	1 mm ²

For agriculture area in Gong zhi' system (standard metric system)

				Metric
fan gong lí				1 km ²
100	gong qīng			1 ha
10,000	100	gong mu		1 a
1,000,000	10,000	100	gong lí or fan mǐ	1 m ²

Upper scale, for general use, in Shí zhí system (market system)

方里	方引	方丈	方尺	Metric
fāng lǐ				25 ha
225	fāng yǐn			11⅓ a
22,500	100	fāng zhàng		11⅓ m ²
2,250,000	10,000	100	fāng chǐ	1/9 m ²

Lower scale, for general use, in Shí zhí system (market system)

方尺	方寸	方分	方厘	方毫	Metric
fāng chǐ					1/9 m ²
100	fāng cùn				11⅓ cm ²
10,000	100	fāng fēn			1/9 cm ²
1,000,000	10,000	100	fāng lí		1/9 mm ²
100,000,000	1,000,000	10,000	100	fāng háo	1/9 μm ²

For agriculture area in Shí zhí system (market system), effective in 1930

市顷	(市) 石	市亩, 畝	市分	市厘	市毫	Metric
qīng						$6\frac{2}{3}$ ha
10	shí					$6\,666\frac{2}{3}$ m ²
100	10	mù				$666\frac{2}{3}$ m ²
1000	100	10	fēn			$66\frac{2}{3}$ m ²
10,000	1000	100	10	lí		$6\frac{2}{3}$ m ²
100,000	10,000	1000	100	10	háo	$2\frac{2}{3}$ m ²

119.4 Units of Volume

National scale defined by metric equivalents in 1908

		Metric
ma or fang		3.276 8 m ³
100	tchí ³	32.768 dm ³

Gong zhi’ system (standard metric system)

				Metric
lǐ fan hao mi				0.1 km ³
1000	lǐ fan lí mi			1,000,000 m ³
1,000,000	1000	lǐ fan fen mi		1000 m ³
100,000,000	1,000,000	1000	lǐ fan mǐ	1 m ³

119.5 Units of Dry Capacity

Upper scale derived from system devised by the Kangxi Emperor after 1662

								Metric
píng								560 L
–	tchung							238 L
–	2 $\frac{1}{5}$	yu						112 L
8	–	1 $\frac{3}{5}$	tché					70 L
–	–	–	25/16	fu				45 L
16	34/5	16/5	2	32/25	ho			35 L
80	34	16	10	6 $\frac{2}{5}$	5	teu		7 L
800	340	160	100	64	50	10	tching	700 mL

Lower scale derived from system devised by the Kangxi Emperor after 1662

							Metric
tching							700 mL
10	ho						70 mL
100	10	cho					7 mL
1000	100	10	chao				700 µmL
10,000	1000	100	10	co			70 µmL
100,000	10,000	1000	100	10		quei	7 µmL

Upper scale in Guangzhou and present-day Beijing, based on [MART3]

						Metric
ping						824.800 000 L
5	juh					164.960 000 L
8	1 $\frac{3}{5}$	tsci				103.100 000 L
12 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{16}$	pu			65.984 000 L
16	3 $\frac{1}{5}$	2	1 $\frac{1}{25}$	vo		51.550 000 L
80	16	10	6 $\frac{2}{5}$	5	teu	10.310 000 L

Lower scale in Guangzhou and present-day Beijing, based on [MART3]

									Metric
teu									10.310 000 L
10	tscing								1.031 000 L
100	10	ho							103.100 mL
200	20	2	jo						51.550 mL
1000	100	10	5	tsho					10.310 mL
10,000	1000	100	50	10	tshao				1.031 mL
100,000	10,000	1000	500	100	10	tso			0.103 1 mL
1,000,000	100,000	10,000	5000	1000	100	10	cuei		0.010 310 mL
64,000,000	6,400,000	640,000	320,000	64,000	6400	640	64	su	0.000 161 mL

In Shanghai, based on [MART3]

				Metric
chi				103.100 L
2	ho			51.550 L
10	5	teu		10.310 L
100	50	10	tsing	1.031 L

Metric-linked system in 1903

							Metric
sin ping							1000 L
10	sin chi						100 L
100	10	sin teou					10 L
1000	100	10	sin cheng				1 L
10,000	1000	100	10	sin ho			1 dL
100,000	10,000	1000	100	10	sin cho		1 cL
1,000,000	100,000	10,000	1000	100	10	sin tchwo	1 mL

National upper scale defined by metric equivalents in 1908

						Metric
ping or yin			磅			517.72 L
5	chei, shi, shih, or sei					103.544 L
10	2	hou				51.772 L
16 $\frac{2}{3}$	3 $\frac{1}{3}$	1 $\frac{1}{3}$	juàn, chuan, jiuán, or tsuan			31.063 L
50	10	5	3	tou		10.354 4 L
500	100	50	30	10	cheng or sheng	1.035 44 L

National lower scale defined by metric equivalents in 1908

						Metric
cheng						1.035 44 L
2	yo					517.72 mL
10	5	khô				103.544 mL
100	50	10	chao			10.354 4 mL
1000	500	100	10	co		1.035 44 mL
10,000	5000	1000	100	10	quei	103.544 µL

Chinese system (market system) effective in 1915

石	斛	斗	升	合	勺	撮	Metric
dàn							103.546 88 L
2	hú						51.773 44 L
10	5	dǒu					10.354 88 L
100	50	10	shēng				1.035 468 8 L
1000	500	100	10	gě			103.546 88 mL
10,000	5000	1000	100	10	sháo		10.354 688 mL
100,000	50,000	10,000	1000	100	10	cuō	1.035 468 8 mL

Gong zhi’ system (standard metric system)

							Metric
gian sheng							1000 L
10	bei sheng						100 L
100	10	shi’ sheng					10 L
1000	100	10	sheng				1 L
10,000	1000	100	10	fan sheng			100 mL
100,000	10,000	1000	100	10	li’ sheng		10 mL
1,000,000	100,000	10,000	1000	100	10	hao sheng	1 mL

Shí zhí system (market system) effective in 1930

市石	市斗	市升	合	勺	撮	Metric
dàn						100 L
10	dǒu					10 L
100	10	shēng				1 L
1000	100	10	gě			100 mL
10,000	1000	100	10	sháo		10 mL
100,000	10,000	1000	100	10	cuō	1 mL

119.6 Units of Liquid Capacity

Liquids were generally measured by weight, but in Shanghai during the nineteenth century, the English gallon = 3.785 310 L was used by inter-national traders.

119.7 Units of Weight

Estimated values listed below, according to [WU]:

1 **liang** (during Ming Dynasty (1368–1644) and Qing Dynasty (1644–1911)) = 37.30 g.

In Guangzhou and present-day Beijing, based on [MART3]

	擔	斤	兩	錢	分	釐	Metric
tsci							72.574 824 kg
1⅓	tan						60.479 020 kg
120	100	jīn					604.790 2 g
1920	1600	16	liǎng				37.799 4 g
19,200	16,000	160	10	qián			3.779 9 g
192,000	160,000	1600	100	10	fēn		377.99 mg
1,920,000	1,600,000	16,000	1000	100	10	lí	37.80 mg

In present-day Beijing, based on [MART3]

兩				Metric
liǎng				37.799 375 g
24	zhu			1.574 974 g
240	10	lǜ		157.497 mg
2400	100	10	su	15.750 mg

In Xiamen before 1858, based on [MART3]

擔	擔	擔	斤	兩	錢	分	釐	毫			metric
tan^a											81.548 426 kg
–	tan^b										64.073 763 kg
140/95	110/95	tan^c									55.336 432 kg
140	110	95	jīn								582.489 g
2157⅔ ₅	1695⅓ ₁₀	1463⅒ ₂₀	15⅔ ₁₀₀	liǎng							37.799 g
–	–	–	–	10	qián						3.779 9 g
–	–	–	–	100	10	fēn					377.99 mg
–	–	–	–	1000	100	10	lí				37.799 mg
–	–	–	–	10,000	1000	100	10	háo			3.779 9 mg
–	–	–	–	100,000	10,000	1000	100	10	sī		378 μg
–	–	–	–	1,000,000	100,000	10,000	1000	100	10	hū	37.8 μg

^aFor rice

^bFor indigo

^cFor sugar

In Shanghai, based on [MART3]

	擔	斤	兩	錢	分	釐	Metric
tsci							72.574 824 kg
1⅓	tan						60.479 020 kg
120	100	jīn					604.790 g
1920	1600	16	liǎng				37.799 g
19,200	16,000	160	10	qián			3.780 g
192,000	160,000	1600	100	10	fēn		378 mg
1,920,000	1,600,000	16,000	1000	100	10	lí	38 mg

Other measures reported in Shanghai during the nineteenth century:

1 **bale** (for silk) = 80 chin = 48.383 216 kg.

Traditional system used before 1858

		擔						Metric
bathar								270 kg
1½	bathar (small)							180 kg
4½	3	tan or pecul						60 kg
9	6	2	timbang					30 kg
64½	43	13¼	6¼	coulack				4.3 kg
462¼	308⅙	93⅓	50	7⅙	kin or catty			600 g
7396	4930⅔	1493⅓	800	114⅔	16	liang		37.5 g
73,960	49,306⅔	14,933⅓	8000	1146⅔	160	10	cien	3.75 g

National scale (Mandarin PY; Mandarin WG) after 1858

	擔	觔	兩	錢	分	Metric
ying; ying						120.96 kg
2	dan; tan					60.48 kg
200	100	jin; chin				604.8 g
3200	1600	16	liǎng; liǎng			37.8 g
32,000	16,000	160	10	qián; ch'in		3.78 g
3,200,000	1,600,000	16,000	1000	100	fēn	3.78 mg

National upper scale defined by metric equivalents in 1908

	擔		斤	兩	Metric
tsci					71.618 kg
1½	tan				59.681 6 kg
4	3⅓	(small) tan			17.905 kg
120	100	30	jīn		596.816 g
1920	1600	480	16	liǎng	37.301 g

National lower scale defined by metric equivalents in 1908

兩	錢		分	釐		毫	Metric
liǎng							37.301 g
10	qián						3.730 1 g
24	2⅕	zhu					1.554 2 g
100	10	4⅙	fēn				373.01 mg
1000	100	41⅓	10	lí			37.301 mg
–	–	100	–	–	shu		15.542 mg
10,000	1000	413⅓	100	10	–	háo	3.730 1 mg

Upper scale in Gong zhi' system (standard metric system)

					Metric
dun					1000 kg
10	gong dan				100 kg
1000	100	gong jin			1 kg
10,000	1000	10	bei kè		100 g
100,000	10,000	100	10	shí kè	10 g

Lower scale in Gong zhi’ system (standard metric system)

					Metric
shí kè					10 g
10	kè				1 g
100	10	fēn kè			100 mg
1000	100	10	lí kè		10 mg
10,000	1000	100	10	háo kè	1 mg

Upper scale in Shí zhí system (market system)

市担 or 擔	市斤	市两	市钱	市分	metric
dàn					50 kg
100	jīn				500 g
1000	10	liǎng			50 g
10,000	100	10	qián		5 g
100,000	1000	100	10	fēn	500 mg

Lower scale in Shí zhí system (market system)

市分	市厘	毫	絲	忽	Metric
fēn					500 mg
10	lí				50 mg
100	10	háo			5 mg
1000	100	10	sī		500 μm
10,000	1000	100	10	hū	50 μm

Metric-linked system used after 1929

								Metric
dun or zhao ke								1000 kg
10	dān							100 kg
100	10	wan ke						10 kg
1,000	100	10	qián ke					1 kg
10,000	1,000	100	10	bai ke				100 g
100,000	10,000	1000	100	10	shí ke			10 g
1,000,000	100,000	10,000	1000	100	10	ke		1 g
10,000,000	1,000,000	100,000	10,000	1000	100	10	fēn	100 mg

For gold, silver and as money weight in Guangzhou and present-day Beijing, based on [MART3]

斤	兩	錢	分	釐	毫			Metric
jīn								601.280 00 g
16	liǎng							37.580 000 g
160	10	qián						3.758 000 g
1600	100	10	fēn					375.800 mg
16,000	1000	100	10	lí				37.580 mg
160,000	10,000	1000	100	10	háo			3.758 mg
1,600,000	100,000	10,000	1000	100	10	sī		375.8 mg
16,000,000	1,000,000	100,000	10,000	1000	100	10	hū	37.58 mg

For gold and silver in Shanghai, based on [MART3]

斤	兩	錢	分	釐	Metric	Metric
jīn					584.960 000 g	611.936 000 g
16	liǎng				36.560 000 g	38.246 000 g
160	10	qián			3.656 000 g	3.824 600 g
1600	100	10	fēn		365.600 mg	382.460 mg
16,000	1000	100	10	lí	36.560 mg	38.246 mg

119.8 Units of Time

日 or 天	时辰	小时	刻	字	分	分	秒	Metric
rì or tiān								24 hours
12	shíchén							2 hours
24	2	xiǎoshí						1 hour
96	8	4	kè ^a					15 minutes
288	24	12	3	zì				5 minutes
1440	120	60	15	5	fēn			1 minute
5760	480	240	60	20	4	(old) fēn		15 seconds
86,400	7200	3600	900	300	60	15	miǎo	1 second

^aThe kè has also been defined as 1/96, 1/100, 1/108 or 1/120 of a day

120 Chobanid Sultanate (1335–1357)

See also *Azerbaijan, Ilkhanate* and *Jalayirid Sultanate*.

The Chobanids took control of present-day Azerbaijan after the fall of the Ilkanate.

121 Chola Empire (c. 300 BCE–1345)

See *Tamilakam*.

122 Christmas Island (Territory of Christmas Island)

See also *Malaysia* and *Straits Settlements*.

Captain William Mynors of the Royal Mary, a British East India Company vessel, named the island when he sailed past it on Christmas Day in 1643. Christmas Island was part of the Straits Settlements and Malaya until Australia gained possession in 1958. Since 1997, Christmas Island

and the Keeling Islands have been collectively called the Australian Indian Ocean Territories.

122.1 Currency

- 1966–: 1 Australian dollar = 100 cents
- 1958–1961: 1 Australian pound = 240 pence
- 1946–1958: 1 Malaya dollar = 100 cents
- 1946: 1 Straits dollar = 100 cents

123 Cisalpine Republic

See also *Cispadine Republic*, *Italian Republic*, *Italy*, and *Transpadane Republic*.

This was a revolutionary state in northern Italy that came into being in 1797, when Napoleon transferred the territories of the former Duchy of Modena to the Transpadane Republic and decreed the birth of the Cisalpine Republic. It was subsequently enlarged by the Cispadine Republic, Campione d’Italia and the Swiss Cantons of the Valtellina. In 1802, the name of the state was changed to the Italian Republic.

123.1 Currency

1797–1802: 1 Cisalpine scudo = 6 lire = 120 soldi

Passion. After that, the atoll was occupied at various times by settlers, military personnel and guano miners. In 1931, the island was declared to be a French possession. Since 1945, the island has had no permanent inhabitants.

124 Ciskei

See *South Africa*.

The Republic of Ciskei was a Bantustan in southeastern South Africa between 1972 and 1994. It was never internationally recognized as a state.

125 Cispadine Republic

See also *Cisalpine Republic*, *Italian Republic*, *Italy*, and *Transpadane Republic*.

A short-lived republic located in Northern Italy that came into birth in 1796 through a combination of the provinces of Modena, Bologna, Ferrara and Reggio Emilia. In 1797, the Cispadine Republic and the Transpadane Republic formed the Cisalpine Republic.

125.1 Currency

1796–1797: 1 Bolognese lira

126 Clipperton Island [Formerly: Ile de la Passion]

The English pirate John Clipperton is said to have passed the island during the early eighteenth century. The French explorers Martin de Chassiron and Michel Du Bocage drew up a map of the island in 1711 and named it Ile de la

127 Cochinchina

See also *Annam Protectorate*, *Cambodia*, *French Indochina*, *Laos*, *Paracel Islands*, *Tonkin*, and *Vietnam*.

In the seventeenth century, present-day Vietnam was divided between the northern Tonkin and the southern Cochinchina. Cochinchina was a French colony from 1862 until 1948. In 1954, South Vietnam was created by merging Cochinchina with Annam.

127.1 Currency

1885–1952: 1 French Indochinese piastre = 100 cents = 500 sapeques
1878–1885: 1 French Cochinchinese piastre = 100 cents
1862–1878: 1 Cochinchinese quan = 10 mas or mottiens = 600 sapeques

127.2 Units of Dry Capacity

For paddy (unthreshed rice)

				Metric
thăng or thẳgsat				37.92 L
2	dau or tau ^a			18.96 L
4	2	kantaing		9.48 L
40	20	10	tanan	948 mL

^aFor a type of rice called **sat**

127.3 Units of Weight

							Metric
quan							314.815 kg
5	ta						62.963 kg
10	2	binh					31.481 5 kg
50	10	5	yen				6.296 3 kg
500	100	50	10	can			629.630 g
800	160	80	16	1⅓	nen		393.519 g
8000	1600	800	160	16	10	luong	39.352 g

128 Cocos (Keeling) Islands
(Territory of the Cocos Islands)

See also *Malaysia*, *Sri Lanka*, and *Straits Settlements*.

In 1609, Captain William Keeling was the first European to see these islands. Alexander Hare, an English adventurer, established a settlement on one of the southern islands in 1823. A Scottish merchant seaman named Captain John Clunies-Ross explored the islands in 1825, aiming to settle on them with his family. A permanent settlement was established on Direction Island in 1827 by Hare and Clunies-Ross, for the purpose of storing East Indian spices for reshipment to Europe during periods of shortage. As the business in spice futures did not develop satisfactorily, Hare left the islands in 1829, leaving Clunies-Ross as the sole owner. The islands were annexed to the British Empire in 1857. In 1867, their administration was placed under the Straits Settlements. The islands were a part of Ceylon (present-day Sri Lanka) between 1878 and 1903, the Straits Settlements from 1903–1939, Ceylon again from 1939–1945 and Malaysia from 1945–1955. In 1955, the islands were transferred to Australian control. In 1978, the Clunies-Ross family was forced to sell the islands to the Australian government.

128.1 Currency

- 1966–: 1 Australian dollar = 100 cents
- 1955–1966: 1 Australian pound = 240 pence

- 1945–1955: 1 Malayan dollar = 100 cents
- 1939–1945: 1 Indian rupee = 100 paisa
- 1903–1939: 1 Straits Settlements dollar = 100 cents
- 1878–1903: 1 Indian rupee = 16 anna = 192 pies
- 1857–1878: 1 pound sterling = 20 shillings = 240 pence
- c. 1830–1857: 1 Cocos rupee

129 Colombia [Formerly: New Granada]

This area was discovered by Spanish explorers in 1499 and first settled in 1529. In 1549, under the name of New Granada, it was established as a Spanish colony. Some of the provinces became independent from Spain between 1812 and 1816. In 1819, Simon Bolívar united Colombia, Ecuador, Panama and Venezuela into the Republic of Gran Colombia, but lost Ecuador and Venezuela to separatists in 1830. Gran Colombia then dissolved into Nueva Granada (present-day Colombia), Ecuador and Venezuela. In 1858, the Granadine Confederation was formed out of the states of Antioquia, Bolivar, Boyaca, Cauca, Cundinamarca, Cucuta, Santander, Tolima and Panama. In 1861, it was established as the United States of New Granada, in 1862, as the United States of Colombia, and in 1886, as the Republic of Colombia. In 1903, Panama broke away and declared its independence.

Weights and measures according to the standard of the Castile were in use until 1854. Common imperial units, such as the yard and the

pound, were also in use for trading until the late nineteenth century. The metric system has been official since 1853 and compulsory since 1854. Colombia adopted the International System of Units as mandatory due to Resolution 005 of April 3, 1995, by Consejo Nacional de Normas y Calidades (National Council of Standards and Qualities, currently discontinued), based on the Colombian National Standard 1000, which was equivalent to the ISO 1000.

Main sources: [KLIM], [MART3], [SOCI], [UN55], and [UN66]

- 1903–1907: 1 US dollar = 100 cents
- 1872–1903: 1 Colombian peso = 100 centavos
- 1853–1872: 1 Colombian peso = 10 decimos = 100 centavos
- 1847–1853: 1 Colombian peso = 10 reales = 100 decimos
- 1837–1847: 1 Colombian peso = 8 reales
- 1820–1837: 1 Colombian escudo = 2 pesos = 16 reales
- 1820: 1 Spanish colonial escudo = 16 reales

129.1 Currency

- 1993–: 1 Colombian peso = 100 centavos
- 1907–1993: 1 Colombian peso oro = 100 centavos

129.2 Units of Quantity

- 1 carga (for hides) = 10.

129.3 Units of Length

Before 1836

							Metric
legua							5298.125 m
62½	cuadra						84.77 m
1250	20	estadal					4.238 5 m
3125	50	2½	braza				1.695 4 m
6250	100	5	2	vara			847.70 mm
18,750	300	15	6	3	pié or pièze		282.57 mm
225,000	360	180	72	36	12	pulgada	23.55 mm

Metric-linked upper scale (determined by the law of May 26, 1836)

					Metric
legua					5000 m
62½	cuadra				80 m
3125	50	braza			1.6 m
5555%	88%	1%	yarda		900 mm
6250	100	2	1⅘	vara granatina	800 mm

Metric-linked lower scale (determined by the law of May 26, 1836)

						Metric
vara granadina						800 mm
3	pie					266⅔ mm
4	1⅓	cuarta				200 mm
8	2⅔	2	ochava			100 mm
40	13⅓	10	5	pulgada		20 mm
400	133⅓	100	50	10	linea	2 mm

Metric scale after 1854

								Metric
miriametro								10,000 m
10	kilometro							1000 m
100	10	hectometro						100 m
1000	100	10	decametro					10 m
10,000	1000	100	10	metro				1 m
100,000	10,000	1000	100	10	decimetro			100 mm
1,000,000	100,000	10,000	1000	100	10	centimetro		10 mm
10,000,000	1,000,000	100,000	10,000	1000	100	10	milimetro	1 mm

129.4 Units of Area

Traditional system

						Metric
caballería^a						15,809.2 m ²
2½	fanegada					7186 m ²
35½	16	aranzada				449.125 m ²
880	400	25	estadal			17.965 m ²
22,000	10,000	625	25	vara cuadrada		71.86 dm ²

^aAccording to [KLIM], there was also a **caballería** = 3864.60 m²

Before 1836

				Metric
fanegada				7056 m ²
16	aranzada			441 m ²
400	25	estadal		17.64 m ²
10,000	625	25	vara cuadrada	70.56 dm ²

Metric-linked system (determined by the law of May 26, 1836)

				Metric
fanegada				6400 m ²
16	aranzada			400 m ²
400	25	estadal		16 m ²
10,000	625	25	vara cuadrada	64 dm ²

Metric scale after 1854

							Metric
hectarea							10,000 m ²
100	area						100 m ²
10,000	100	centiarea or metro cuadrado					1 m ²
1,000,000	10,000	100	decimetro cuadrado				1 dm ²
100,000,000	1,000,000	10,000	100	centimetro cuadrado			1 cm ²
10,000,000,000	100,000,000	1,000,000	10,000	100	milimetro cuadrado		1 mm ²

129.5 Units of Volume

1 **metro cubico** (for timber) = 1000 decímetros cubicos = 1 m³.

129.6 Units of Dry Capacity

For general use (determined by the law of May 26, 1836)

			Metric
cahiz			259.20 L
12	fanega		21.60 L
144	12	almud	1.80 L

For cereals

			Metric
fanega			55.50 L
12	celemin		4.625 L

129.7 Units of Liquid Capacity

Traditional system

			Metric
arroba			16.14 L
4	cuartilla		4.035 L

For oil, according to the standard of Castile

					Metric
bota					481.582 L
1 $\frac{1}{2}$	pipa				433.423 L
38 $\frac{1}{3}$	34 $\frac{1}{2}$	arroba			12.563 L
153 $\frac{1}{3}$	138	4	quartillo		3.140 75 L
3833 $\frac{1}{3}$	3450	100	25	quarterone, cuarteron or panilla	125.63 mL

Other measures reported during the nineteenth century:

1 **galón** = 1 British Wine gallon = 3.758 4 L.

Metric-linked system (determined by the law of May 26, 1836)

					Metric
moyo					64 L
8	cántara				8 L
17 $\frac{1}{15}$	2 $\frac{2}{15}$	galón			3.75 L
64	8	3 $\frac{3}{4}$	azumbre		1 L
85 $\frac{1}{3}$	10 $\frac{2}{3}$	5	1 $\frac{1}{3}$	botella	750 mL

Metric scale after 1854

						Metric
hectolitro						100 L
10	decalitro					10 L
100	10	litro				1 L
1000	100	10	decilitro			100 mL
10,000	1000	100	10	centilitro		10 mL
100,000	10,000	1000	100	10	mililitro	1 mL

129.8 Units of Weight

Some measures reported during the early nineteenth century:

- 1 **bale** = 233 kg;
- 1 **carga** (for wheat) = 400 libras of Castilla = 184.037 2 kg;
- 1 **carga** (for general use) = 250 libras of Castilla = 115.023 25 kg;
- 1 **zurron** (for indigo and crimson) = 150 libras of Castilla = 69.013 95 kg;
- 1 **fanega** (for corn) = 112 libras of Castilla = 51.530 42 kg;
- 1 **fanega** (for cacao) = 110 libras of Castilla = 50.610 23 kg;
- 1 **fanega** (for cacao from Maracaibo in Venezuela) = 96 libras of Castilla = 44.168 93 kg.

Metric-linked system reported in the early to mid-nineteenth century

							Metric
tonelada							1000 kg
8	carga						125 kg
20	2½	quintal^a					50 kg
80	10	4	arroba				12.5 kg
2000	250	100	25	libra			500 g
32,000	4000	1600	400	16	onza		31.25 g
50,000,000	6,250,000	2,500,000	625,000	25,000	1562½	quilate	20 mg

^aUsed for grain

Metric-linked system (determined by the law of May 26, 1836)

						Metric
quintal						50 kg
4	arroba					12.5 kg
100	25	libra granatina				500 g
1600	400	16	onza			31.25 g
25,600	6400	256	16	adarme		1.953 g
1,024,000	256,000	10,240	640	40	grano	48.8 mg

130.2 Units of Weight

Metric-linked system during the late nineteenth century

		Metric
alfu kilogramme		1000 kg
1000	kilogramme	1 kg

131 Congo [Formerly: Congo Free State, Belgian Congo, Congo/Leopoldville, Congo/Kinshasa, Zaire]

See also *Katanga, Kingdom of Kongo*, and *South Kasai*.

In ancient times, this territory was occupied by the Negrito peoples. Europeans began exploring the area in the late 1870s, under the sponsorship of King Leopold II of Belgium. In 1885, Leopold II, as a result of the Treaty of Berlin, named it the Congo Free State, despite the fact that it was essentially his personal possession. The Congo Free State was subsequently transferred from being the personal property of Leopold II to a Belgian colony, becoming the Belgian Congo in 1908. The Republic gained its independence in 1960. Two southern provinces, South Kasai and Katanga, declared themselves independent from the Congo in 1960, but they were reincorporated in 1961 and 1963, respectively. The name was changed to Zaire in 1971 and to the Democratic Republic of the Congo in 1997.

The metric system has been official since 1884 and compulsory since 1911.

Main source: [LAMA]

131.1 Currency

1998–:	1 Democratic Congolese franc = 100 centimes
1993–1998:	1 nouveau zaire = 100 nouveaux makuta
1967–1993:	1 zaire = 100 makuta or centimes

1967:	1 likuta = 100 sengi
1960–1967:	1 Congolese franc = 100 centimes
1960–1962:	1 Katanga franc = 100 centimes
1952–1960:	1 Belgian Congo franc = 100 centimes
1887–1952:	1 Belgian franc = 100 centimes
1885–1887:	1 mitako (a brass rod about 6 inches long) = 10 nzimbu (According to the Bahuana scale, as reported in 1905 from the Kwilu-Kwango area) 1 block of salt (about 2 or 3 lbs) = 50 fawls = 100 mitakos
Eighteenth century:	1 jimbu, simbu, or simbo = a olive nana shell (by the trading Bayaka tribes called nzimbu mbudi)
Eighteenth century:	1 ntsengo = 300 simbo shells (in the Kwango region)
Eighteenth century:	1 lukasu = 50 nsambu (= copper rings; in the Katanga and Kasai regions)
Eighteenth century:	various iron gongs and bells, called gunga, were used as currency in the Welle-Ubangi region
Eighteenth century:	musaga, ikumi, or viringi (various names for strings of snailshells used as currency by the Warega and the Wezzimba in the Lualaba region) 1 kiringi = a bunch of 16 strings of snailshells
Eighteenth century:	1 madiba = a piece of woven cloth some 60 by 40 cm (in the Upper Sankuru)
Eighteenth century:	woven mats made of fine strips of Raphia palm leaves in square pieces, called madiba, bongo and nlabu
Fourteenth–nineteenth centuries:	1 katanga cross = a cross made of copper or iron that was used by the Kasai and Lomami peoples as trade currency

131.2 Units of Quantity

- 1 **lunani** (for fish) = 80;
 1 **makumole** = 20;
 1 **mbondo** or **koni** (in Kingoyi dialect) = 12;
 1 **bankaka** = some;
 1 **nzole** = 2.

131.3 Units of Length

Traditional measures reported during the nineteenth and early twentieth centuries:

- 1 **ndiatulu alumu** = the distance a person was able to travel by foot in a day;
 1 **ntanzala ambweno** = in sight;
 1 **nkwanga** or **nkwangu** = a fathom;
 1 **la kwakoko, bula, or bwakoko** = the length of a man's arm;
 1 **nkwangu mboma, kipa** (in Madzia dialect), or **tanda** (in Manyanga dialect) = the distance from the elbow to the tip of the middle finger;
 1 **ntama** = a pace;
 1 **tambi** = the length of a human foot;
 1 **nsadila akoko** or **akandazi** = the breadth of the hand including the thumb;
 1 **sadila kwalembo** = the breadth of a man's finger.

131.4 Units of Area

Metric system after 1911, as written by the Kikongo-speaking population

			Metric
fekatoalea			10,000 m ²
100	alea		100 m ²
10,000	100	meta kialuse	1 m ²

131.5 Units of Volume

- 1 **kianga kiankumi** = as much firewood as a person could carry in his arms.

131.6 Units of Dry Capacity

Traditional measures reported during the nineteenth and twentieth centuries:

- 1 **zitu kiatiti** = a load of hay;
 1 **bola** = a bowl of fruit or other commodities;
 1 **fuka** = a handful of peanuts;
 1 **koto, koko kwanguba** (in the Manyanga dialect), **kiyedi** (in the Kingoyi dialect), or **poka** (in the Madzia dialect) = a handful of cereal, etc.

Metric system after 1911, as written by the Kikongo-speaking population

						Metric
kumi diakilometa						10 km
10	kilometa					1 km
10,000	1000	meta				1 m
100,000	10,000	10	desimeta			100 mm
1,000,000	100,000	100	10	sentimeta		10 mm
10,000,000	1,000,000	1000	100	10	milimeta	1 mm

Other measures reported during the twentieth century:

- 1 **kombe dianlangu** (for maritime use) = about 7420.44 m.

131.7 Units of Liquid Capacity

Traditional measures reported during the nineteenth and twentieth centuries:

- 1 **mpimpa** = a large barrel;
 1 **kinzenzo** (in the Musana dialect) or **nkimbi** (in the Kingoyi dialect) = a small barrel;

1 **mpanana akoko** = a bucket;
1 **mbungu, mubaya, or mbasa** (in the Musana dialect) = a mug of water or other liquids.

Metric system after 1911, as written by the Kikongo-speaking population

					Metric
hekatolita					100 L
100	lita				1 L
1000	10	desilita			100 mL
10,000	100	10	sentilita		10 mL
100,000	1000	100	10	mililita	1 mL

131.8 Units of Weight

Metric system after 1911, as written by the Kikongo-speaking population

							Metric
ningu or ndinga							1000 kg
1000	kilongame						1 kg
10,000	10	hekatongame					100 g
1,000,000	1000	100	ngame				1 g
10,000,000	10,000	1000	10	desingame			100 mg
100,000,000	100,000	10,000	100	10	sentingame		10 mg
1,000,000,000	1,000,000	100,000	1000	100	10	milingame	1 mg

Other measures reported during the twentieth century:

1 **sac** (for coffee) = 60 kg;
1 **tezo** (for diamonds and gemstones) = 200 mg.

132 Congo [Formerly: French Congo, Middle Congo, Congo-Brazzaville, Congo]

See also *Kingdom of Kongo*.

The Franco-Italian explorer Pierre Savorgnan de Brazzà signed a treaty with Makoko, ruler of the Bateke people, in 1880, thus establishing French control over Congo. It was first called French Congo, and after 1905, Middle Congo. The French Congo included both Middle Congo and Gabon. In 1904, Gabon was reestablished as a separate territory. In 1908, Middle Congo, Chad, Gabon, and Oubangui-Shari were joined together to form French Equatorial Africa. Middle Congo

was renamed the Republic of the Congo-Brazzaville, and gained its independence in 1960. In 1992, the name was changed to Congo.

132.1 Currency

1960–: 1 CFA franc = 100 centimes
1901–1960: 1 franc = 100 centimes

133 Congo-Brazzaville

See *Congo*.

134 Congo-Kinshasa

See *Congo*.

135 Congo-Leopoldville

See *Congo*.

136 Cook Islands [Formerly: Saint Bernard, Harvey Islands]

The Spanish sailor Alvaro de Mendada discovered the Cook Islands in 1595, and named them Saint Bernard. The Portuguese navigator Pedro Fernandes de Quieros landed on Rakahanga in 1606. Captain James Cook visited the islands in 1773, 1774 and 1777, and named the islands the

Harvey Islands. Later, a Russian cartographer renamed them the Cook Islands. The Cook Islands became a British protectorate in 1888, and were annexed to New Zealand in 1901. In 1965, they were granted internal self-government, though New Zealand retains responsibility for their defence and foreign affairs. Niue is geographically part of the Cook Islands, but is administratively separate.

The Maori had no written history, but scholars believe that traditional measures, based on the dimensions of body-parts, were used before the first Polynesians arrived from the Society Islands around 500 CE. European missionaries and traders arrived during the early 1840s, introducing both the British Imperial system

136.2 Units of Quantity

1 **kā’oi** = a bunch of bananas, cassavas, pineapples, guavas, melons, mangoes, or tomatoes.

136.3 Units of Length

Some traditional measures:

- 1 **mārō** = the distance between the tip of the middle fingers when the arms are stretched out;
- 1 **anga** = an arm’s length;
- 1 **angārīma** = the span between the tip of the thumb and the tip of the little finger.

British Imperial-linked scale

						Metric
maire						1609.330 m
80	tētāti					201.166 m
800	10	tiēni				20.117 m
17,600	220	22	iāti			914.392 mm
52,800	660	66	3	tapoae		304.797 mm
633,600	7920	792	36	12	‘ini	25.400 mm

and some Hebrew weights and measures. Very little is known about their traditional units of measurement. Since the late twentieth century, the metric system has been reported to be in use.

Main sources: [BUSE] and [SYED]

After metrification:

1 **mīta** = a meter.

136.4 Units of Area

British Imperial-linked scale:

1 **eka** = an acre = ~4047 m².

136.5 Units of Dry Capacity

Hebrew-linked scale

		Metric
kora		~360 L
100	ómer	~3.6 L

136.1 Currency

- 1972–: 1 Cook Islands dollar (= 1 New Zealand dollar) = 100 cents
- 1967–1971: 1 New Zealand dollar = 100 cents
- 1901–1967: 1 New Zealand pound = 20 shillings = 240 pence
- 1888–1901: 1 pound sterling = 20 shillings = 240 pence
- 1840s– 1 moni Tire (Chilean peso) =
- 1888: 100 centavos

136.6 Units of Liquid Capacity

British Imperial-linked scales

			Metric
tāpō			27.26 L
6	kārani		4.54 L
24	4	koata	1.136 L

136.7 Units of Weight

Hebrew-linked scale

			Metric
mina			~232 g
20	sekela		~11.6 g
400	20	kera^a	~580 mg

^aThe Hebrew *gerah* = the weight of nine barleycorns

British Imperial-linked scale

			Metric
tane			1016.047 kg
2240	paunu		453.592 g
35,840	16	‘auniti	28.349 g

After metrification:

1 **kiro** = a kilogram.

137 Coral Sea Islands (Coral Sea Islands Territory)

This is a group of small and mostly uninhabited tropical islands and reefs. Since 1969, it has been a possession of Australia.

British Imperial-linked system after 1815 and after 1878

						Imperial	Metric	Metric
miglio						1 statute mile	1609.329 551 m	1609.344 m
8	stadio					1 furlong	201.166 191 m	201.168 m
320	40	camaco				1 pole	5.029 155 m	5.029 2 m
1760	220	5½	jarda jonia			1 yard	914.392 mm	0.914 4 m
5280	660	16½	3	piede		1 foot	304.797 mm	304.8 mm
63,360	7920	198	36	12	onci	1 inch	25.399 75 mm	25.4 mm

138 Corfu

See also *France, Greece, Italy, and United Kingdom*.

From 1386 to 1797, Corfu (the second largest of the Ionian Islands) was ruled by Venetian nobility. In 1797, the island was ceded to France. By the Treaty of Paris in 1815, all of the Ionian Islands became a protectorate of the United Kingdom. In 1864, the Islands were united with Greece.

Ottoman and Venetian measures were widely used until the early nineteenth century. From 1829, the English system came into general use.

Main sources: [KELL], [KISC], [KRÜG], [MART3], [MCCU], and [NOBA]

138.1 Currency

2001–: 1 euro = 100 cents
 1875–2001: 1 Greek drachma = 100 lepta
 1864–1875: 1 dollar = 104 oboli = 520 obolicci
 1815–1864: 1 Pound Sterling = 20 shillings = 240 pence

138.2 Units of Length

Ventian scale before 1815

			Metric
passo			1.739 m
5	piede or pie		347.735 mm
60	12	onué	28.978 mm

Other measures reported during the early nineteenth century:

- 1 **moggio** = 3862 m;
- 1 **braccio da lana** or **braccio da panno** (for wool) = 683.396 mm;
- 1 **braccio da seta** (for silk) = 638.721 mm.

138.3 Units of Area

For vineyards

				Metric
moggio				9672.300 m ²
8	misura^a or baccile			1209.037 m ²
24	3	zappada^b		403.012 m ²
9600	1200	400	passi quadra	1.007 m ²

^aLater also reported as 1393 m²

^bA day's worth of digging

138.4 Units of Volume

Firewood was sold by the square passo, which was only 2 feet thick; however, the thickness was dependent on the quality of the wood.

Stone was sold by the **passo cubo**.

138.5 Units of Dry Capacity

Traditional system

		Metric
moggio		168.424 L
8	misura	21.053 L

British Imperial scale

			Imperial	Metric
chiló			1 bu	36.348 655 L
8	gallone jonia		1 gal	4.543 582 L
64	8	dicotilo	1 pt	567.948 mL

For salt

			Metric
centinajo			42.9 kg
30	sacco		1.43 kg
60	2	mozzetta	715 g

Other reported measures:

- 1 **baccile** = 44 L;
- 1 **moggio** (for lime) = 19.13 L (= 1 Venetian cubic foot), but later reduced to about 9.6 L.

138.6 Units of Liquid Capacity

British Imperial-linked system for wine at Corfu, Paxi, Cephalonia, Lefkada and Ithaca; at Zakynthos; at Kythira

			Imperial	Metric	Imperial	Metric	Imperial	Metric
barila^a			15 gal	68.154 L	14 ¹ / ₁₆ gal	66.734 L	12 gal	54.523 L
60	agastera			1.135 8 L		1.112 2 L		908.7 mL
120	2	quartuccio		567.9 mL		556.1 mL	1/10 gal	454.3 mL

^a[MART3] reported 1 **barile** (for oil at Zakynthos) = 66.714 L

For wine

			Metric
barila			68.137 L
4	jar		17.034 L
128	32	quartuccio	532.3 mL

For oil

				Metric
barila				68.137 L
4	jar			17.034 L
24	6	miltro		2.839 L
96	24	4	quartucco	709.8 mL

British Imperial-linked system after 1829

				Imperial	Metric
barila				16 gal	72.697 310 L
4	metro			4 gal	18.174 327 L
16	4	gallone jonia		1 gal	4.543 582 L
128	32	8	dicotilo	1 pt	567.948 mL

Other reorted measures during the nineteenth century:

1 **pipe** (for wine from Cephalonia) = 454 L.

138.7 Units of Weight

British Imperial upper scale (Avoirdupois)

					Metric
migliaio					453.592 652 kg
10	centinaio or talento				45.359 265 kg
1000	100	libbra jonia			453.593 g
16,000	1600	16	onzia		28.349 g
256,000	25,600	256	16	dramma	1.772 g

British Imperial lower scale (Troy)

				Metric
libbra sottile				373.242 g
12	onzia			31.103 g
240	20	calco		1.555 g
5760	480	24	grano	64.79 mg

For salt on Corfu and Paxos, according to [KISC] and [KELL]

			Metric	Metric
centinajo			59.7 kg	2010.924 kg
30	sacco		1.99 kg	67.031 kg
60	2	mozetta	995.1 g	33.515 kg

139 Cospaia (Today Part of the Region of Umbria)

See also *Italy* and *Papal State*.

This area unexpectedly gained independence in 1440, when Pope Eugene IV sold the territory to the Republic of Florence, but forgot to mention Cospaia in the sale treaty. Its inhabitants promptly declared themselves independent. Tuscany and the Papal States divided the republic between them in 1826.

140 Costa Rica

See also *Mexico*.

Christopher Columbus visited Costa Rica in 1502. Costa Rica was part of the Vice-Royalty of New Spain from 1522 until 1821, when it was exchanged for rule by Iturbide’s Mexican Empire. Costa Rica became part of the United Provinces of Central America in 1823, independent from Mexico in 1824 and a Republic in 1848.

The metric system was adopted in 1858, became official in 1881 and has been compulsory since 1912.

Main sources: [MARO], [MART3], [MEDI], [UN55], [UN66], [VELO], and [WIGH]

140.1 Currency

1919–:	1	Costa Rican	colón	=	100 céntimos
1917–1919:	1	Costa Rican	colón	=	100 centavos
1896–1916:	1	Costa Rican	colón	=	100 céntimos
1864–1896:	1	Costa Rican	peso	=	100 centavos
1850–1864:	1	Costa Rican	peso	=	8 reales
1842–1850:	1	Costa Rican	escudo	=	16 reales
1824–1838:	1	Central American	escudo	=	2 pesos = 16 reales
–1823:	1	Spanish colonial	escudo	=	2 pesos = 16 reales

140.2 Units of Length

Old scale

								Metric
mecate								20.143 2 m
24	vara							839.3 mm
48	2	media						419.65 mm
72	3	1½	tercia or pie					279.767 mm
96	4	2	1⅓	cuarta, palmo, or quarta				209.825 mm
864	36	18	12	9	pulgada			23.313 9 mm
10,368	432	216	144	108	12	linea		1.942 8 mm
124,416	5184	2592	1728	1296	144	12	punto	0.161 9 mm

Other measures reported during the nineteenth century:

1 legua = 5573.33 m.

New scale

								Metric
mecate								20.064 m
12	braza ^a							1.672 m
24	2	vara						836.00 mm
72	6	3	tercia or pie					278.67 mm
96	8	4	1⅓	cuarta, palmo, or quarta				209.00 mm
864	72	36	12	9	pulgada			23.22 mm

^aMainly used by fishermen

140.3 Units of Area

Castilian-linked system in San José before 1857, based on [MART3]

			Metric
caballeria			448,189.984 2 m ²
64 $\frac{1}{2}$	manzana		6987.371 7 m ²
641 428 $\frac{1}{2}$	10 000	vara cuadrada	69.873 717 m ²

Alternative system reported during the late nineteenth century

			Metric
caballeria			450 831.67 m ²
64	manzana		7 044.244 9 m ²
640,000	10,000	vara cuadrada	70.442 449 m ²

Alternative system reported during the late nineteenth century

			Metric
caballeria			454,353.80 m ²
64 $\frac{1}{2}$	manzana		7044.244 9 m ²
645,000	10,000	vara cuadrada	70.442 449 m ²

Alternative system reported during the late nineteenth century

				Metric
caballeria				452,535.16 m ²
64 $\frac{3}{4}$	manzana			6988.958 m ²
518	8	solar		873.620 m ²
647,500	10,000	1250	vara cuadrada	69.889 6 m ²

140.4 Units Volume

Some other reported measures:

1 **vara** (for mahogany) = 1 vara \times 1/9 vara \times 1/2
vara = 32.45 dm³.

During the nineteenth century and mid-twentieth centuries

						Metric	Metric
fanega (for fresh coffee beans)						399.84 L	408 L
1 $\frac{1}{5}$	fanega (for maize, beans and fresh potatoes)					332.3 L	340 L
24	20	cajuela or cazuela (for beans)				16.67 L	17 L
96	80	4	cuartillo			4.165 L	4.25 L
612	510	25 $\frac{1}{2}$	6 $\frac{3}{8}$	botella		–	666.67 mL
2448	2040	102	25 $\frac{1}{2}$	4	cuarta	–	166.67 mL

140.5 Units of Capacity

Other measures reported during the nineteenth century:

- 1 **fanega** (Castilian scale) = 25 cajuelas = 55.501 000 L;
- 1 **cajuela** (Castilian scale) = 2.220 040 L;

- 1 **botella** (for milk) = varying by location between 0.63 and 0.67 L;
- 1 **botella** (for wine and liquor) = varying by location between 0.70 and 0.75 L;
- 1 **cajuela** or **cazuela** (for liquids) = 18.75 L.

140.6 Units of Weight

Traditional upper scale

						Metric
tonelada						920.125 440 kg
5 $\frac{7}{8}$	carga ^a					161.021 952 kg
10	1 $\frac{3}{4}$	fanega ^b				92.012 544 kg
20	3 $\frac{1}{2}$	2	quintal			46.006 272 kg
80	14	8	4	arroba		11.501 568 kg
2000	350	200	100	25	libra	460.062 72 g

^aAs **carga de papa** (for potatoes) = 1800 libras = 828.113 kg

^bFor lime = 225 libras = 103.513 kg

Traditional lower scale

				Metric
libra				460.062 72 g
16	onza			28.753 92 g
256	16	adarme		1.797 12 g
9216	576	36	grano	49.92 mg

Metric-linked system

						Metric
tonelada						920 kg
10	fanega					92 kg
20	2	quintal ^a				46 kg
57 $\frac{1}{2}$	5 $\frac{3}{4}$	2 $\frac{7}{8}$	caja or cafa			16 kg
80	8	4	1 $\frac{9}{23}$	arroba		11.50 kg
2000	200	100	34 $\frac{18}{23}$	25	libra	460 g

^aAs **fardo de tabac** for tobacco

System used in the candy and sugar cane juice trade

			Metric
tamuga			2.07 kg
2	stado		1.035 kg
4 $\frac{1}{2}$	2 $\frac{1}{4}$	libra	460 g

British Imperial-linked system for maize

		Metric
fanega de maize		348.359 kg
768	lata ^a	453.592 g

^aAlso reported, during the mid-twentieth century, as 453.1 g

For coffee beans, as reported in 1885

		Metric
carga		115.015 kg
12	arroba	9.585 kg

Some other reported measures:

- 1 **zurrone** (for cochineal) = 150 libras di Castilian = 69.013 959 kg;
- 1 **tercio** (for suggar) = 100 libras = 46.009 300 kg;
- 1 **quintal** (for coffee, rice, dried skins and goat skins) = 100 libras = 46.009 300 kg;
- 1 **quintal** (for cacao) = 60 libras = 27.605 580 kg;
- 1 **arroba** (for tobacco and sarsaparilla (*Smilax regelii*)) = 25 libras = 11.502 325 kg;
- 1 **libras** (for balsam from Peru and for silver) = 460.093 g.

For apothecaries' use

			Metric
libra			345.047 04 g
12	onza		28.753 92 g
6912	576	grano	49.92 mg

System based on [DEMA]

							Metric
benda							61.50 g
1 $\frac{1}{3}$	assuwa						46.12 g
2	1 $\frac{1}{2}$	egguba or benda-assa					30.75 g
2 $\frac{2}{3}$	2	1 $\frac{1}{3}$	sirou				23.05 g
4	3	2	1 $\frac{1}{2}$	ensamio			15.37 g
8	6	4	3	2	agirague or quientas		7.68 g
16	12	8	6	4	2	mediaraba	3.84 g

Upper scale, based on [MÜLL]

							Metric
benda							54.432 g
1 $\frac{3}{16}$	eqwa-abiessan						41.472 g
1 $\frac{3}{32}$	1 $\frac{1}{2}$	eggub-abion					27.648 g
3 $\frac{3}{16}$	3	2	egwa				13.824 g
5 $\frac{1}{4}$	4	2 $\frac{2}{3}$	1 $\frac{1}{3}$	asjan			10.368 g
6 $\frac{3}{10}$	4 $\frac{4}{5}$	3 $\frac{1}{5}$	1 $\frac{1}{5}$	1 $\frac{1}{5}$	perré-surré		8.640 g
7 $\frac{7}{8}$	6	4	2	1 $\frac{1}{2}$	1 $\frac{1}{4}$	egwa-surré	6.912 g

141 Côte d'Ivoire [Formerly: Ivory Coast]

See also *Mali Empire*.

The French settled Assinie and Grand Bassam in 1637. In 1882, the Ivory Coast was made part of Rivières du Sud (later Guinea). Côte d'Ivoire became a French Colony in 1893, and part of French West Africa in 1895. In 1958, Côte d'Ivoire became an autonomous member of the French Community. In 1960, it gained its independence.

The metric system has been official since 1884, and compulsory since 1890.

Main sources: [ABEL], [AMON], [BARB], [CLOZ], [DEMA], [GARR], [MÜLL], [ROCH] and [UN66]

141.1 Currency

1945–: 1 CFA franc = 100 centimes

1890s–1945: 1 franc = 100 centimes

141.2 Units of Weight

During the early eighteenth century, according to [BARB]:

1 **benda** = 62.20 g.

Lower scale, based on [MÜLL]

								Metric
egwa-surré								6.912 g
1⅓	ensanne							5.184 g
2	1½	egyrauqué						3.446 g
4	3	2	metaba					1.728 g
5⅓	4	2⅔	1⅓	assur-bima				1.296 g
10⅔	8	5⅓	2⅔	2	assé			648 mg
32	24	16	8	6	3	takou		216 mg
96	72	48	24	18	9	3	damba	72 mg

System, based on [BOWD]

		Metric
pereguan		69.120 g
5	ackies, dowá, egubba, n'dua, gua or egwa	13.824 g

System, based on [ROCH]

	takous	Metric
ta-bourou or n'da-bourou	2430	532.17 g
péreguan-nan	1313	287.54 g
benda-ann	1024	224.25 g
benda-nsan	768	168.19 g
n'da-n'san or ta-san	720	157.68 g
n'tasa	717	157.02 g
pérignan-nyon or péreguannia	640	140.16 g
banna-nyon or banna-niua	576	126.14 g
benda-nyon or benda-niu	512	112.12 g
péreguan	320	70.08 g
banna	288	63.07 g
benda	256	56.06 g
asoasa	243	53.21 g
anan-n'san or anrasan	216	47.30 g
gua-n'san or n'duasan	192	42.04 g
anui-n'san or anruésan	168	36.79 g
atakpi or attaué	160	35.04 g
anan-nuon or anraninua	144	31.54 g
n'duania	128	28.03 g
gua-nyon	126	27.59 g
anui-nyon or anunia	112	24.52 g
bandya or bandéa	104	22.77 g
gbang, bandya-nuon, or bagouandénua	96	21.02 g
assan-nyon or assénua	88	19.27 g
tya-sué or etté-sui	81	17.73 g
tya-sué or ettésai	80	17.52 g
tya-sué	78	17.08 g
anan or anraé	72	15.77 g

(continued)

	takous	Metric
gua or n'dua	64	14.01 g
anui or anrué	56	12.26 g
tya-bandya or asia	54	11.52 g
tya-bandya or etéa	52	11.38 g
gbang-bandya or bagonandéa	48	10.51 g
assan or essan	44	9.63 g
bari or baré	40	8.76 g
simbari or zémaré	36	7.88 g
tra or taraé	32	7.00 g
anui-sué or anuzui	28	6.13 g
bandya-sué or bandézui	26	5.69 g
bandya-sié, n'dara-sué, or nzarasé	24	5.25 g
kuabo or tuabo	22	4.81 g
nzonazan	20	4.38 g
simbali-fan or zamalfan	18	3.94 g
borofou	16	3.50 g
nzonsan or n-san	14	3.06 g
essoba	13	2.84 g
nziensan	12	2.62 g
méttéba	8	1.75 g
takou	1	219 mg

142 Country of Curaçao

See *Netherlands Antilles*.

143 Crete

See also *Kingdom of Candia*, *Greece* and *Ottoman Empire*.

After being conquered by the Romans, Byzantines, Moslems and Venetians, this island became part of the Ottoman Empire in 1669. In

1820, Crete was ceded to Egypt, which returned the island to the Turks in 1840. After the Second Balkan War, Crete was joined with Greece in 1913.

Main source: [MART3]

143.1 Units of Length

1 **pik** = 637.79 mm.

143.2 Units of Dry Capacity

1 **carga** = 152.30 L;

1 **chileh** = 35.25 L.

143.3 Units of Liquid Capacity

In Chania

		Metric
barile		89.304 L
8	mistate	11.163 L

143.4 Units of Weight

For oil (generally sold by weight)

		Metric	Metric
mistate		10.193 509 L	11.927 000 kg
8½	oka	1.199 236 L	1.403 176 kg

				Metric
cantaro				52.766 400 kg
44	oka			1.199 236 kg
100	2½	rotolo		479.694 g
17,600	400	160	dramma ^a	2.998 g

^aUsed for gold, silver and pearls

Croatia was united with Hungary. During the Fourth Crusade (1202–1204), the city fell under control of the Republic of Venice. In 1358, Venice was defeated by the Hungarian kingdom. In 1808, Napoleon took control of the area and the Republic of Ragusa, Croatia, Slovenia and Bosnia became part of France's Illyrian provinces. In 1813, the French were expelled and Hapsburg rule over Croatia was restored. With the Austro-Hungarian Ausgleich of 1867, Hungary gained greater autonomy and control over Croatia. Croatia gained its independence in 1918 as part of the Kingdom of Serbs, Croats and Slovenes, which was renamed Yugoslavia in 1929. After invasion by Italy and Germany, Croatia was formed in 1941, but reincorporated into Yugoslavia in 1945. It remained part of Yugoslavia until 1991, when it gained its independence. The breakaway republic of Serbian Krajina remained independent until 1995, when it was reincorporated into Croatia.

The metric system has been compulsory since 1876.

Main sources: [HERK], [UN55], and [UN66]

144.1 Currency

1994–: 1 Croatian kuna = 100 lipas
 1991–1993: 1 Croatian dinar = 100 para
 1945–1990: 1 Yugoslav dinar = 100 para
 1941–1945: 1 Croatian kuna = 100 banica
 1929–1941: 1 Yugoslav dinar = 100 para
 1919–1929: 1 Serbian dinar = 100 para
 1918–1919: 1 Croatian krone = 100 filler
 1892–1918: 1 Austrian krone = 100 heller
 1878–1892: 1 Austrian gulden = 100 kreuzer
 –1878: 1 Ottoman piaster = 40 para

144 Croatia [Formerly Part of Yugoslavia]

See also *Hungary*.

Western Croatia was a separate kingdom from eastern Croatia (Slavonia). In 1102, Western

144.2 Units of Area

In Slavonia, parcels were generally divided into plots of 1000, 1296 or 2000 Quadratklafers of Vienna.

144.3 Units of Dry Capacity

1 **kila** (for general use in Slavonia) = 218.757 L;
 1 **stajo** (in Rijeka) = 81.446 4 L;
 1 **metze** (in Rijeka) = 63.175 5 L;
 1 **Metzen** (in Rijeka) = 63.157 4 L;
 1 **Metzen-Getreide** (in Rijeka) = 63.070 312 L;
 1 **Kupelnik** (in Karlovac) = 36.198 396 L.
 1 **okka** (in Slavonia) = 1.594 6 L.

In Rijeka

		Metric
stajo		83.317 2 L
12	lacino	6.943 1 L

For cereals in Slavonia

		Metric
kila		19.992 L
224	icze	89.25 mL

In Zagreb

		Metric
kila		190.890 L
120	oka	1.590 75 L

144.4 Units of Liquid Capacity

Two reported scales in Rijeka

		Metric	Metric
orna		53.907 500 L	53.892 100 L
32	boccale	1.684 610 L	1.684 128 L

144.5 Units of Weight

In Osijek and Slavonia

			Metric
torvar			126.041 17 kg
100	oka		1.260 141 7 kg
225	2¼	Wiener Pfund	560.063 g

Other reported measures:

1 **funto** (in Rijeka) = 558.758 g.

145 Crown of Castile

See also *Kingdom of Castile*, *Kingdom of León*, and *Spain*.

The Kingdom of Castile and the Kingdom of León became united in 1230, when Ferdinand III received the Kingdom of León from his father Alfonse IX. It came to include ten regions: the Kingdoms of Castile, Córdoba, Galicia, Jaén, León, Murcia, Seville, and Toledo, as well as the minor Principality of Asturias and the Lordship of Biscay. The Crown of Castile came into union with the Crown of Aragon in 1479, when Ferdinand V ascended to the Aragonese throne.

In 1261, Alfonso X (1221–1284) declared the *vara*, equal to three Roman feet (= about 888 mm), to be the standard for linear measures, the *cahiz of Toledo* for arid measures, the *moyo of Valladolid* for wine, the 10-pound *arrelde of Burgos* for meat, and the *Alfonsí mark* for weight, respectively. In 1268, Alfonso X substituted the *moyo of Seville* for that of Valladolid and reduced the *arrelde* from 10 to 4 pounds. The use of local weights and measures continued throughout the following decade, with the *arrelde* being the only standardized unit that remained constant. In 1348, Alfonso XI (1312–1350) advocated for the *vara* used in Burgos (= about 835 mm) to be the standard unit of length. This *vara* was cut into the wall of the cathedral of Burgos on an unknown date, and so became known as the “*vara de Burgos*.” Later, it also became known throughout the Hispanic world as the “*vara de Castilla*.” He also substituted the *cántara of Toledo* for the *moyo*

of Seville, stated that olive oil and honey should be sold by weight, and let the Toledo cahiz give way to its more frequently used fraction, the *fanega*. The Alfonsí mark was superseded by the *Cologne mark* for gold, silver, and vellon. The *Troy mark* was used for all other commodities. Still, some cities, towns, and villages neglected to adopt the national standards. In 1435, John II (1406–1454) declared that the fanega of Ávila superseded that of Toledo. The *yard of Toledo* was adopted as standard for linear measures. The *mark of Burgos* became standard for weighing silver, the *mark of Toledo* for weighing gold, and the *pound of Toledo* for all other commodities. El Procurador del Común, the Attorney of the Common, opposed unification of weights and measures and, in 1436, urged the Crown to revert to the *Cologne mark* for precious metals and jewels and the *pound* for all other commodities. They also urged him to legalize the local measures for cloth, grain, and wine in use before 1435, and to state that salt and vegetables should be measured by the *fanega of Ávila* and olive oil and honey by the *cántara of Toledo*. In 1536, the official length of the vara in

Spain was reported as 32.874 8 in = about 835.02 mm. In 1568, Philip II of Spain (1527–1598) declared the prototype of the vara kept in Burgos to be the official standard for Spain and all its possessions. However, the vara continued to vary in size at various times and places.

Main sources: [ALSI], [ALTE], [ARAV], [BURR2], [CHIA], [CLAU], [COLE], [DIRE], [FLÜG], [HAMI], [KELL], [LLYD], and [TORR2]

145.1 Units of Quantity

- 1 miles = 1000;
- 1 resma (for paper) = 500 sheets;
- 1 ciento = 100;
- 1 mano (for paper) = 24 or 25 sheets;
- 1 docena = 12;
- 1 pair = 2;
- 1 ristra (for garlic) = a string.

145.2 Units of Length

After 1568

							Metric
toesa or braza							1.68 m
2	vara ^a						840 mm
4	2	codo					420 mm
6	3	1½	pie				280 mm
24	12	6	4	palmo			70 mm
72	36	18	12	3	pulgada		23.3 mm
96	48	24	16	4	1⅓	dedo	1.75 mm

^aThe vara of Burgos, the Castilian standard after 1568, has been reported in a range from 835.9 mm to 837.9 mm

145.3 Units of Dry Capacity

After 1435, the scale of Ávila was official for the Crown of Castile.

For acorns, ashes, barley, bran, chick-peas, coriander, filberts, habas, lentils, lime, mustard, plaster of Paris, rye, walnuts, and wheat

										Metric
cahiz										666.012 L
3	carga^a									222.004 L
12	4	fanega^b								55.501 L
36	12	3	hemina^c							18.500 L
48	16	4	1⅓	cuartilla						13.875 L
144	48	12	4	3	celemín or almud^d					4.625 083 L
288	96	24	8	6	2	medio				2.312 L
576	192	48	16	12	4	2	cuartillo			1.156 L
1728	576	144	48	36	12	6	3	cuchara		385.42 mL
2304	768	192	64	48	16	8	4	1⅓	ración or ochavo	289.07 mL
9216	3072	768	256	192	64	32	16	5⅓	4	ochavillo 72.267 mL

^aFor grain

^b[SAIG, p.142] reported one fanega as 56.3 L

^cAppeared only in León and the neighboring districts of Old Castile

^dThe almud prevailed in Andalusia, and the celemín in Castile-León

Other measures reported during the fifteenth–eighteenth centuries:

1 **tercio** (for fish) = varying between 4½ and 5 arrobas;

1 **cesto** (for fish) = a basket of indeterminate size.

145.4 Units of Liquid Capacity

Toledo scale for brandy, ink, vinegar, and wine

					Metric
moyo					259.84 L
2⅔	carga				113.68 L
16	7	cántara^a or arroba			16.24 L
128	56	8	azumbre		2.03 L
512	224	32	4	cuartillo	507.5 mL

^aReported to be equal in volume to 34 libras (the weight) of clear water from the Tagus in Toledo

Menor or sisada scale adopted in 1602 for vinegar when sold to final consumers

					Metric
moyo					227.36 L
2½	carga				99.47 L
16	7	cántara or arroba			14.21 L
128	56	8	azumbre		1.78 L
512	224	32	4	cuartillo	444.1 mL

Toledo scale for linseed, olive oil, and sweet almond

					Metric
arroba ^a					12.55 L
4	cuartilla				3.137 5 L
25	6¼	libra			502 mL
100	25	4	panilla		125.5 mL
400	100	16	4	onza	31.4 mL

^aSaid to equal 25 libras (the weight) of clear water. Normally reported in a range from 12.5 to 12.63 L
Great diversity characterized olive oil measures in the province of Toledo, according to [BURR2, pp. 356–357]
In Toledo, there was also a **arroba menor** for olive oil = 9.6 L

For water

			Metric
arroba menor			12.564 L
4	quartilla		3.141 L
100	25	quarterone	125.64 mL

Toledo scale for milk after 1458

		Metric
cántara ^a		20.3 L
8	azumbre ^b	2.537 5 L

^aReported as varying from 4 to 9 azumbres, but 8 seems to have been the normal number
^bSaid to equal 5 wine cuartillos

For honey until 1438 (in practice used well into the sixteenth century)

				Metric
arroba ^a				12.55 L
4	cuartilla			3.137 5 L
25	6¼	libra		502 mL

^aIn Olías, the arroba of honey weighed 50 libras

145.5 Units of Weight

								Metric
quintal macho ^a								69.013 95 kg
1½	quintal							46.009 3 kg
6	4	arroba						11.502 325 kg
37½	25	6¼	arrelde					1.840 372 kg
75	50	12½	2	libra carnicera				920.186 g
150	100	25	4	2	libra			460.093 g
2400	1600	400	64	32	16	onza		28.755 8 g
9600	6400	1600	256	128	64	4	cuarta	7.188 9 g

^aFor iron and steel

145.6 A Coruña

145.6.1 Units of Length

Galician scale

				Metric
vara gallega				1.085 5 m
3	pie			316.83 mm
4	1⅓	Palmo		271.375 mm
36	12	9	pulgada	30.153 mm

Castilian scale

		Metric
codo de ribera		557.270 mm
2	pie de Castilla	278.635 mm

Other reported measures:

1 **pie** (in Ferrol) = 277.700 mm.

145.6.2 Units of Area

Galician and Castilian scale

				Metric	Metric
ferrado				639.584 1 m ²	628.863 5 m ²
1 ¹ / ₂₅	otro ferrado			444.155 6 m ²	–
900	625	vara cuadrada		71.064 9 dm ²	69.873 7 dm ²
8100	5625	9	pie cuadrada	7.896 1 dm ²	7.763 7 dm ²

145.6.3 Units of Volume

		Metric
codo cúbico		173.060 dm ³
8	pie cúbico	21.632 dm ³

145.6.4 Units of Dry Capacity

For wheat; for maize and Turkish grain; for other commodities; in Ferrol

				Metric	Metric	Metric	Metric
fanega				64.600 L	83.480 L	66.192 7 L	74.001 333 L
4	ferrado			16.150 L	20.870 L	16.548 2 L	18.500 333 L
96	24	cuartillo		672.917 mL	869.583 mL	689.507 mL	770.847 mL
384	96	4	onza	168.229 mL	217.396 mL	172.377 mL	192.712 mL

145.6.5 Units of Liquid Capacity

For wine

							Metric
moyo							498.560 L
1 ¹ / ₁₅	bota						467.400 L
4	3¾	cañada					124.640 L
16	15	4	olla				31.160 L
32	30	8	2	cántara			15.580 L
272	255	68	17	8½	azumbre		1.832 941 L
1088	1020	272	68	34	4	cuartillo	458.235 mL

For brandy

			Metric
bota			657.200 L
30	cántara		16.430 L
1020	34	cuartillo	483.235 mL

For oil

			Metric
arroba			12.430 L
2	media arroba		6.215 L
25	12½	cuartillo	497.200 mL

145.6.6 Units of Weight

							Metric
quintal							57.511 625 kg
4	arroba						14.377 906 kg
100	25	libra^a					575.116 g
2000	500	20	onza				28.756 g
8000	2000	80	4	cuarto			7.189 g
32,000	8000	320	16	4	adarme		1.797 g
1,152,000	288,000	11,520	576	144	36	grano	49.9 mg

^a1 **libra gallega** (for mercantile use) = 575.625 g

For medical use

							Metric
libra medicinal							345.069 675 g
12	onza						28.755 806 g
96	8	dracma					3.594 476 g
288	24	3	escrupulo				1.198 159 g
576	48	6	2	obolo			599.079 mg
1728	144	18	6	3	siliqua		199.693 mg
6912	576	72	24	12	4	grano	49.923 mg

For gold, silver and money

						Metric
marco						230.046 450 g
8	onza					28.755 806 g
64	8	ochava				3.594 476 g
128	16	2	adarme			1.797 238 g
384	48	6	3	tomin		599.073 mg
4608	576	72	36	12	grano	49.923 mg

Other reported measures:

1 **fanega** (for cacao) = 110 libras de Castilla =
50.610 230 kg.

145.7 Albacete

145.7.1 Units of Length

					Metric
vara					837 mm
3	pie				279 mm
4	1⅓	palmo			209.25 mm
36	12	9	pulgada		23.25 mm
48	16	12	1⅓	dedo	17.42 mm

145.7.2 Units of Area

					Metric
fanega					7005.690 m ²
2	almud				3502.845 m ²
12	6	celemin			583.807 5 m ²
48	24	4	cuartille		145.595 187 5 m ²
10,000	5000	833⅓	208⅓	vara cuadrada	70.056 9 dm ²

145.7.3 Units of Dry Capacity

					Metric
cahiz					679.75 L
12	fanega				56.646 L
144	12	celemin			4.720 5 L
576	48	4	cuartille		1.180 1 L
2304	192	16	4	ochave	295.03 mL

145.7.4 Units of Liquid Capacity

					Metric
arroba					12.73 L
2	media arroba				6.365 L
8	4	azumbre			1.591 L
32	16	4	cuartille		397.8 mL
128	64	16	4	copa	99.4 mL

145.7.5 Units of Weight

						Metric
tonelada						916 kg
20	quintal					45.80 kg
80	4	arroba				11.450 kg
2000	100	25	libra			458 g
32,000	1600	400	16	onza		28.625 g
512,000	25,600	6400	256	16	adarme	1.789 g

145.8 Principality of Asturias

145.8.1 Units of Length

The same units as in *Burgos* were in use here.

145.8.2 Units of Area

In Oviedo

					Metric
dia de bueyes					1257.726 9 m ²
2	medio dia				628.863 45 m ²
4	2	cuarto de dia			314.431 72 m ²
1800	900	450	vara cuadrada		69.873 7 dm ²

145.8.3 Units of Dry Capacity

In Oviedo

						Metric
fanega asturiana						74.14 L
4	cuartilla					18.535 L
8	2	copin				9.267 5 L
12	3	1½	celemine			6.178 3 L
48	12	6	4	cuartillo		1.544 6 L
192	48	24	16	4	ochavillo	386.15 mL

145.8.4 Units of Liquid Capacity

For wine in Oviedo

					Metric
cántara or arroba de vino^a					18.41 L
8	azumbre				2.301 25 L
32	4	cuartillo			575.31 mL
128	16	4	copa		143.83 mL

^a1 **arroba** (for spiritus) = 16.133 L

145.8.5 Units of Weight

In Oviedo

			Metric
libra asturiana			613.46 g
3	marco		204.49 g
24	8	onza	25.56 g

145.9 Ávila

145.9.1 Units of Area

							Metric
aranzada de viña^a							4471.917 8 m ²
1 ¹ / ₁₅	fanega de puño^b						4192.422 9 m ²
1 ¹ / ₇	1 ¹ / ₁₄	peonada de prado^c					3912.928 1 m ²
2	1 ⁷ / ₈	1 ³ / ₄	huebra				2235.958 9 m ²
12 ⁴ / ₅	12	11 ¹ / ₅	6 ⁷ / ₅	obrado			349.368 6 m ²
400	375	350	200	31 ¹ / ₄	estadal		11.179 8 m ²
6400	6000	5600	3200	500	16	vara cuadrada	69.873 7 dm ²

^aFor vineyards

^bThere was also a **fanega de tierra** = 5625 varas cuadradas = 3930.396 58 m²

^cFor meadows

145.9.2 Units of Volume

1 vara cúbica = 584.077 893 273 842 625 dm³.

145.9.3 Units of Dry Capacity

						Metric
cahiz						676.80 L
12	fanega					56.40 L
24	2	media fanega				28.20 L
144	12	6	celemín			4.70 L
576	48	24	4	cuartille		1.175 L
2304	192	96	16	4	ochave	293.75 mL

145.9.4 Units of Liquid Capacity

					Metric
cántara					15.92 L
2	media cántara				7.96 L
8	4	azumbre			1.99 L
32	16	4	cuartille		497.5 mL
128	64	16	4	copa	124.375 mL

145.10 Badajoz

145.10.1 Units of Length

The same units as in *Burgos* were in use here.

145.10.2 Units of Area

			Metric
fanega			6439.561 749 734 4 m ²
9216	vara cuadrada		69.873 716 902 5 dm ²
82,944	9	píe cuadrada	7.763 746 322 5 dm ²

145.10.3 Units of Volume

The same units as in *Burgos* were in use here.

145.10.4 Units of Dry Capacity

						Metric
cahiz						670.08 L
12	fanega					55.84 L
24	2	media fanega				27.92 L
144	12	6	celemin			4.653 L
576	48	24	4	cuartille		1.163 L
2304	192	96	16	4	ochavo	290.83 mL

145.10.5 Units of Liquid Capacity

For wine

					Metric
arroba					16.42 L
2	media arroba				8.21 L
8	4	azumbre			2.052 5 L
32	16	4	cuartille		513.125 mL
128	64	16	4	copa	128.281 mL

For oil

					Metric
arroba					12.42 L
2	media arroba				6.21 L
4	2	cuartilla			3.105 L
60	30	15	cuartillo		207 mL
120	60	30	2	medio cuartillo	103.5 mL

145.10.6 Units of Weight

						Metric
tonelada						814 kg
20	quintal					40.70 kg
80	4	arroba				10.175 kg
2000	100	25	libra			407 g
32,000	1600	400	16	onza		25.44 g
512,000	25,600	6400	256	16	adarme	1.59 g

145.11 Burgos

145.11.1 Units of Length

											Metric
legua											5572.699 m
44 ⁴ / ₅	cuadra										125.386 m
1666 ² / ₃	37 ¹ / ₂	estado									3.343 619 m
3333 ¹ / ₃	75	2	braza								1.671 810 m
4000	90	2 ⁷ / ₅	1 ¹ / ₅	paso							1.393 175 m
6666 ² / ₃	150	4	2	1 2/3	vara de Burgos						835.904 85 mm
20,000	450	12	6	5	3	pie					278.634 9 mm
30,000	675	18	9	7 ¹ / ₂	4 ¹ / ₂	1 ¹ / ₂	palmo				185.756 6 mm
240,000	5400	144	72	60	36	12	8	pulgado			23.219 579 mm
2,880,000	64,800	1728	864	720	432	144	96	12	linea		1.934 965 mm
34,560,000	777,600	20,736	10,368	8640	5184	1728	1152	144	12	punto	161.25 µm

145.11.2 Units of Volume

1 vara cúbica = 584.077 893 273 842 625 dm³.

145.11.3 Units of Dry Capacity

					Metric
cahiz					652.08 L
12	fanega				54.34 L
144	12	celemín			4.528 L
576	48	4	cuartille		1.132 L
2304	192	16	4	ochave	283.02 mL

145.11.4 Units of Liquid Capacity

				Metric
cántaro				14.10 L
8	azumbre			1.762 L
32	4	cuartille		440.625 mL
128	16	4	copa	110.156 mL

145.12 C  ceres

145.12.1 Units of Length

The same units as in *Burgos* were in use here.

145.12.2 Units of Area

At Almaraz

					Metric
yera					7533 m ²
12	cuarta				627.75 m ²
1200	100	estadal			6.277 5 m ²
10,800	900	9	vara cuadrada		69.75 dm ²
97,200	8100	81	9	pie cuadrada	7.75 dm ²

At C  ceres

			Metric
fanega			6439.561 749 734 4 m ²
9216	vara cuadrada		69.873 716 902 5 dm ²
82,944	9	pie cuadrada	7.763 746 322 5 dm ²

145.12.3 Units of Dry Capacity

At C  ceres

						Metric
cahiz						645.12 L
12	fanega					53.76 L
24	2	media fanega				26.88 L
144	12	6	celemin			4.48 L
576	48	24	4	cuartille		1.12 L
2304	192	96	16	4	ochavo	280 mL

145.12.4 Units of Liquid Capacity

For wine

				Metric
c��ntara				12.303 L
8	azumbre			1.537 9 L
32	4	cuartille		384.469 mL
128	16	4	copa	96.117 mL

For oil

			Metric
arroba			11.431 2 L
25	libra		457.248 mL
100	4	panilla	114.312 mL

Alternative scale for wine and oil at C  ceres

		Metric	Metric
cuarto		3.46 L	3.20 L
2	medio cuarto	1.73 L	1.60 L

145.12.5 Units of Weight

						Metric
tonelada						912 kg
20	quintal					45.60 kg
80	4	arroba				11.40 kg
2000	100	25	libra			456 g
32,000	1600	400	16	onza		28.5 g
512,000	25,600	6400	256	16	adarme	1.78 g

145.13 Cádiz

145.13.1 Units of Length

											Metric
legua nueva											6687.240 m
1½	legua legal										5572.700 m
–	–	cuerda									7.105 192 m
2000	1666⅔	2 1/8	estadal								3.343 620 m
4000	3333⅓	4¼	2	braza							1.671 810 m
4800	4000	5⅒	2⅔	1½	paso						1.393 175 m
8000	6666⅔	8½	4	2	1⅔	vara					835.905 mm
16,000	13,333⅓	17	8	4	3½	2	codo				417.952 5 mm
24,000	20,000	25½	12	6	5	3	1½	pié			278.635 mm
32,000	26,666⅔	34	16	8	6⅔	4	2	1⅓	palmo		208.976 mm
64,000	53,333⅓	68	32	16	13⅓	8	4	2⅔	2	octava	104.488 mm
128,000	106,666⅔	136	64	32	26⅔	16	8	5⅓	4	2	ava 52.244 mm

145.13.2 Units of Area

								Metric
caballeria								386,373.705 0 m ²
1½	yugada							321,978.087 5 m ²
60	50	fanegada						6439.561 75 m ²
720	600	12	celemin					536.630 14 m ²
2880	2400	48	4	cuartillo				134.157 54 m ²
34,560	28,800	576	48	12	estadal cuadrado			11.179 79 m ²
552,960	460,800	9216	768	192	16	vara cuadrada		69.874 dm ²
4,976,640	4,147,200	82,944	6912	1728	144	9	pié cuadrado	7.764 dm ²

145.13.3 Units of Dry Capacity

Two reported scales

							Metric	Metric
lastre^a							2655.84 L	2618.112 L
4	cahice						663.96 L	654.528 L
48	12	fanega					55.33 L	54.544 L
576	144	12	celemin				4.611 L	4.545 333 L
1152	288	24	2	medio			2.305 L	2.272 667 L
2304	576	48	4	2	cuartillo		1.153 L	1.136 333 L
9216	2304	192	16	8	4	racione	288.18 mL	284.083 mL

^aWhen used for salt = 5200 libras = 2392.483 600 kg. For other commodities, said to equal 5000 libras = 2300.465 000 kg

145.13.4 Units of Liquid Capacity

For wine

						Metric
pipa						516.256 L
32	arroba mayor					16.133 L
256	8	azumbre				2.016 625 L
1024	32	4	cuartille			504.157 mL
4096	128	16	4	copa		126.039 mL

For oil

							Metric
bota							484.020 L
77/69	pipa						431.940 L
1 ²⁷ / ₅₀	1 ¹⁹ / ₅₀	arroba					12.52 L
6 ⁹ / ₂₅	5 ¹³ / ₂₅	4	cuartilla				3.120 L
38½	34½	25	6¼	libra			500.8 mL
154	138	100	25	4	panilla		125.2 mL
616	552	400	100	16	4	onza	31.3 mL

145.13.5 Units of Weight

							Metric
tonelada							920.185 80 kg
20	quintal						46.009 29 kg
80	4	arroba					11.502 32 kg
2000	100	25	libra				460.092 9 g
8000	400	100	4	cuarteron			115.023 2 g
32,000	1600	400	16	4	onza		28.755 8 g
256,000	12,800	3200	128	32	8	ochava	3.594 5 g

145.14 Córdoba

145.14.1 Units of Area

							Metric
fanega							6121.228 7 m ²
2	media fanega						3060.614 35 m ²
–	–	aranzada					3672.737 22 m ²
–	–	2	media aranzada				1836.368 61 m ²
8760 ⁵ / ₁₂	4380 ⁵ / ₂₄	5256 ¹ / ₄	2628 ³ / ₈	vara cuadrada			69.873 7 dm ²
140, 166 ² / ₃	70, 083 ² / ₃	84,100	42,050	16	palma cuadrada		4.367 1 dm ²
1,261,500	630,750	756,900	378,450	144	9	pié cuadrada	48.523 cm ²

145.14.2 Units of Dry Capacity

					Metric
cahiz					662.40 L
12	fanega				55.20 L
144	12	celemin			4.60 L
576	48	4	cuartille		1.15 L
2304	192	16	4	ochavo	287.5 mL

145.14.3 Units of Liquid Capacity

					Metric
arroba					16.31 L
8	azumbre				2.039 L
32	4	cuartille			509.7 mL
128	16	4	copa		127.4 mL

145.15 Cuenca

145.15.1 Units of Dry Capacity

					Metric
cahiz					650.04 L
12	fanega				54.17 L
144	12	celemin			4.514 L
576	48	4	cuartillo		1.128 L
2304	192	16	4	ochavo	282.1 mL

145.15.2 Units of Liquid Capacity

					Metric
arroba					15.76 L
8	azumbre				1.97 L
32	4	cuartillo			492.5 mL
128	16	4	copa		123.1 mL

145.16 Cuidad Real

145.16.1 Units of Length

					Metric
vara					839 mm
3	pié				279.67 mm
4	1 ¹ / ₃	palmo			209.75 mm
36	12	9	pulgada		23.305 mm
432	144	108	12	dedo	19.421 mm

145.16.2 Units of Dry Capacity

					Metric
cahiz					654.496 L
12	fanega				54.541 L
144	12	celemin			4.545 L
576	48	4	cuartille		1.136 L
2304	192	16	4	ochavo	284.1 mL

145.16.3 Units of Liquid Capacity

For wine and brandy

				Metric
arroba				16.00 L
8	azumbre			2.00 L
32	4	cuartille		500 mL
128	16	4	copa	125 mL

For oil

				Metric
arroba				12.44 L
25	libra			497.6 mL
100	4	panilla		124.4 mL

145.17 Guadalajara

145.17.1 Units of Area

				Metric
fanega				3105.498 5 m ²
2	media fanega			1552.749 2 m ²
4444%	2222%	vara cuadrada		69.873 7 dm ²
40,000	20,000	9	píe cuadrada	7.763 7 dm ²

145.17.2 Units of Dry Capacity

					Metric
cahiz					657.60 L
12	fanega				54.80 L
144	12	celemin			4.567 L
576	48	4	cuartillo		1.141 7 L
2304	192	16	4	ochavo	285.42 L

145.17.3 Units of Liquid Capacity

For oil

				Metric
arroba				12.70 L
25	libra			508.0 mL
100	4	panilla		127.0 mL

145.18 Huelva

145.18.1 Units of Area

				Metric
fanega				3689.332 3 m ²
2	media fanega			1844.666 15 m ²
5280	2 640	vara cuadrada		69.873 7 dm ²
84,480	42 240	16	palmo cuadrada	4.367 1 dm ²

145.18.2 Units of Liquid Capacity

					Metric
arroba					15.78 L
8	azumbre				1.972 5 L
16	2	jarro			986.25 mL
32	4	2	cuartillo		493.125 mL
128	16	8	4	copa	123.281 mL

For oil

				Metric
arroba mayor				20.71 L
1 ⁷ / ₁₈	arroba menor			17.75 L
21	18	jarro		986.2 mL
42	36	2	cuartillo	493.1 mL

145.19 Jaén

145.19.1 Units of Area

					Metric
fanega					6262.781 2 m ²
2	media fanega or almud				3131.390 6 m ²
8963	4481½		vara cuadrada		69.873 7 dm ²
80,667	40,333½	9	píe cuadrada		7.763 4 dm ²

145.19.2 Units of Dry Capacity

					Metric
cahiz					656.88 L
12	fanega				54.74 L
144	12	celemin			4.562 L
576	48	4	cuartillo		1.140 4 L
2304	192	16	4	ochavo	285.1 mL

145.19.3 Units of Liquid Capacity

					Metric
arroba					16.04 L
8	azumbre				2.005 L
32	4		cuartillo		501.25 mL
128	16	4	copa		125.31 mL

For oil

					Metric
arroba					14.24 L
27	libra				527.41 mL
108	4		panilla		131.85 mL

145.20 León

145.20.1 Units of Area

						Metric
emina de secoano						939.335 71 m ²
1½	emina de regadio					626.238 06 m ²
2	1⅓	media emina de secoano				469.667 85 m ²
3	2	1½	media emina regadio			313.111 90 m ²
1344⅔	896⅔	672⅔	448⅔	vara cuadrada		69.873 72 dm ²
12,099	8066		4033	9	píe cuadrada	7.763 75 dm ²

145.20.2 Units of Dry Capacity

					Metric
cahiz					533.04 L
12	fanega				44.42 L
36	3	emina			14.807 L
144	12	4	celemin		3.701 7 L
576	48	16	4	cuartillo	925.42 mL

145.20.3 Units of Liquid Capacity

					Metric
cántara					15.84 L
8	azumbre				1.98 L
32	4		cuartillo		495.0 mL
128	16	4	copra		123.75 mL

145.21 Lugo

145.21.1 Units of Length

				Metric
vara				855 mm
3	tercia			285 mm
36	12	pulgada		23.75 mm

145.21.2 Units of Area

				Metric
ferrado				436.710 7 m ²
2	medio ferrado			218.355 35 m ²
625	312½	vara cuadrada		69.873 7 dm ²
5625	2812½	9	pie cuadrada	7.763 7 dm ²

145.21.3 Units of Dry Capacity

				Metric
fanega				52.52 L
4	ferrado			13.13 L
12	3	celemin		4.377 L
48	12	4	cuartillo	1.094 L

145.21.4 Units of Liquid Capacity

					Metric
moyo					127.84 L
4	cañada				31.96 L
16	4	olla			7.99 L
72	17	4¼	azumbre		1.775 L
288	68	17	4	cuartillo	443.9 mL

For cooking oil and brandy

			Metric
arroba			11.75 L
25	cuartillo		470 mL
400	16	onza	29.4 mL

145.21.5 Units of Weight

					Metric
quintal					45.84 kg
4	arroba				11.46 kg
80	20	libra			573 g
400	100	5	cuarteron		114.6 g
1600	400	20	4	onza	28.65 g

145.22 Madrid

Both a local scale and the Castilian scale of Burgos were in use until 1859.

145.22.1 Units of Length

Before 1859

						Metric
vara						843.0 mm
3	pie					281 mm
4	1⅓	palmo				210.75 mm
36	12	9	pulgada			23.417 mm
432	144	108	12	línea		1.951 mm
5184	1 728	1 296	144	12	punto	162 µm

Upper Burgos scale before 1859

						Metric
legua						6687.240 000 m
969 ²³ / ₃₃	cuerda					6.896 216 m
2000	2 ¹ / ₁₆	estadal				3.343 620 m
4000	4 ¹ / ₈	2	braza			1.671 810 m
4800	4 ¹⁹ / ₂₀	2 ² / ₅	1 ¹ / ₅	paso		1.393 175 m
8000	8 ¹ / ₄	4	2	1 ² / ₃	vara de Burgos	835.905 mm

Lower Burgos scale before 1859

											Metric
vara de Burgos											835.905 mm
2	codo										417.952 mm
3	1 ¹ / ₂	píe									278.635 mm
4	2	1 ¹ / ₃	palmo								208.976 mm
6	3	2	1 ¹ / ₂	geme							139.317 mm
8	4	2 ² / ₃	2	1 ¹ / ₃	colo						104.488 mm
12	6	4	3	2	1 ¹ / ₂	palmo de ribera					69.659 mm
36	18	12	9	6	4 ¹ / ₂	3	pulgada				23.220 mm
48	72	16	12	8	6	4	1 ¹ / ₃	dedo			17.415 mm
432	648	144	108	72	54	36	12	9	linea		1.935 mm
5184	7776	1728	1296	864	648	432	144	108	12	punto	161 μm

145.22.2 Units of Area

Before 1859

				Metric
fenega llamada Marco de Madrid				3423.812 1 m ²
2	media fanega			1711.906 05 m ²
4900	2450	vara cuadrada de Burgos		69.873 7 dm ²
44,100	22,050	9	píe cuadrada	7.763 7 dm ²

Burgos scale before 1859

								Metric
caballeria								386 373.705 0 m ²
1 $\frac{1}{5}$	yugada							321 978.087 5 m ²
60	50	fanegada						6 439.561 7 m ²
86 $\frac{2}{5}$	72	1 $\frac{1}{25}$	aranzada					4 471.917 9 m ²
720	600	12	8 $\frac{1}{3}$	celemin				536.630 1 m ²
2880	2400	48	33 $\frac{1}{3}$	4	cuartillo			134.157 5 m ²
34,560	28,800	576	400	48	12	estadal cuadrado		11.179 795 m ²
552,960	460,800	9216	6400	768	192	16	vara cuadrada	69.873 7 dm ²
4,976,640	4,147,200	82,944	57,600	6912	1728	144	9 pié cuadrado	7.763 7 dm ²

145.22.3 Units of Volume

Before 1859

			Metric
toesa cubica			4.672 623 m ³
8	vara cubica		584.078 dm ³
108	27	pié cubico	21.633 dm ³

145.22.4 Units of Dry Capacity

Local scale and Burgos scale before 1859

							Metric	Metric
cahiz							664.080 L	666.012 00 L
12	fanega						55.340 L	55.501 000 L
48	4	cuartilla					13.835 L	13.875 250 L
144	12	3	celemin				4.611 7 L	4.625 083 L
576	48	12	4	cuartillo			1.152 9 L	1.156 271 L
2304	192	48	16	4	ochavo		288.23 mL	289.068 mL
9216	768	192	64	16	4	ochavillo	72.06 mL	72.267 mL

145.22.5 Units of Liquid Capacity

Local scale for wine before 1859

				Metric
arroba				16.30 L
8	azumbre			2.037 5 L
32	4	cuartillo		509.375 mL
128	16	4	copa	127.344 mL

Burgos scale for wine before 1859

								Metric
bota								483.990 000 L
1 $\frac{1}{9}$	pipa							435.591 000 L
1 $\frac{7}{8}$	1 $\frac{1}{16}$	moyo						258.128 000 L
30	27	16	cantara					16.133 000 L
120	108	64	4	cuartilla				4.033 250 L
240	216	128	8	2	azumbre			2.016 625 L
960	864	512	32	8	4	cuartillo		504.156 mL
3840	3456	2048	128	32	16	4	copa	126.039 mL

Burgos scale for oil before 1859

							Metric
bota							483.714 000 L
1 $\frac{7}{9}$	pipa						433.458 000 L
38 $\frac{1}{2}$	34 $\frac{1}{2}$	arroba menor					12.564 000 L
962 $\frac{1}{2}$	862 $\frac{1}{2}$	25	libra				502.560 mL
3850	3450	100	4	panilla			125.640 mL
15,400	13,800	400	16	4	onza		31.410 mL

145.22.6 Units of Weight

Traditional system for construction materials (plaster, lime, etc.) in Madrid

				Castilian libra	Metric
cahiz^a				1344	618.364 992 kg
24	sack			56	25.765 208 kg
168	7	arroba		8	3.680 744 kg

^aLater also reported as 15 quintales = about 690 kg (see also [WECK, p. 422])

Burgos scale before 1859

								Metric
Tonelada								920.185 800 kg
13 $\frac{1}{3}$	quintal macho							69.013 935 kg
20	1 $\frac{1}{2}$	quintal						46.009 290 kg
80	6	4	arroba					11.502 323 kg
2000	150	100	25	libra				460.093 g
8000	600	400	100	4	cuarteron			115.023 g
32,000	2400	1600	400	16	4	onza		28.756 g
256,000	19,200	12,800	3200	128	32	8	ochava	3.594 g

For medical use

							Metric
libra medicinal							345.069 675 g
12	onza						28.755 806 g
96	8	dracma					3.594 476 g
288	24	3	escrupulo				1.198 159 g
576	48	6	2	obolo			599.079 mg
1728	144	18	6	3	siliqua		199.693 mg
6912	576	72	24	12	4	grano	49.923 mg

Burgos scale for gold

				Metric
Marco				230.046 450 g
50	castellano			4.600 929 g
400	8	tomin		575.116 mg
4800	96	12	grano	47.926 mg

Local subdivision for gold, silver and money

						Metric
marco						230.046 450 g
8	onza					28.755 806 g
64	8	ochava				3.594 476 g
128	16	2	adarme			1.797 238 g
384	48	6	3	tomin		599.073 mg
4608	576	72	36	12	grano	49.923 mg

For diamonds and jewels

			Metric
onza			27.957 034 g
140	quilat		199.693 mg
560	4	grano	49.923 mg

Metric-linked system after 1859

							Metric
tonelada metrica							1000 kg
10	quintal metrico						100 kg
100	10	arroba metrica					10 kg
1000	100	10	libra metrica				1 kg
10,000	1000	100	10	onza metrica			100 g
100,000	10,000	1000	100	10	dracma metrica		10 g
1,000,000	100,000	10,000	1000	100	10	escrupulo metrica	1 g

145.23 Taifa of Murcia

145.23.1 Units of Length

				Metric
vara				835.905 mm
3	pie			278.635 mm
4	1½	palmo		208.976 mm
36	12	9	pulgada	23.220 mm

145.23.2 Units of Area

					Metric
fanega					6707.876 8 m ²
6	tahulla				1117.979 5 m ²
48	8	ochava			139.747 4 m ²
1536	256	32	braza		4.367 1 m ²
9600	1600	200	6¼	vara cuadrada	69.874 dm ²

145.23.3 Units of Dry Capacity

					Metric
cahiz					663.36 L
12	fanega				55.28 L
144	12	celemin			4.607 L
576	48	4	cuartillo		1.151 7 L
2304	192	16	4	ochavo	287.92 mL

145.23.4 Units of Liquid Capacity

				Metric
arroba				15.60 L
8	azumbre			1.95 L
32	4	cuartillo		487.5 mL
128	16	4	copa	121.875 mL

145.24 Ourense

145.24.1 Units of Area

				Metric
ferrado				628.863 5 m ²
1 ^{11/25}	cavadura			436.710 7 m ²
900	625	vara cuadrada		69.873 7 dm ²
8100	5 625	9	pié cuadrada	7.763 7 dm ²

145.24.2 Units of Dry Capacity

For general use and maize

					Metric	Metric
fanega					55.52 L	75.16 L
4	ferrado				13.88 L	18.79 L
12	3	celemin			4.627 L	6.263 L
48	12	4	cuartillo		1.156 7 L	1.565 8 L
96	24	8	2	copelo	578.33 mL	782.92 mL

145.24.3 Units of Liquid Capacity

					Metric
moyo					127.64 L
4	cañado				31.91 L
8	2	cántara			15.955 L
72	18	9	azumbre		1.772 8 L
288	72	36	4	cuartillo	443.19 mL

145.24.4 Units of Weight

					Metric
quintal					57.40 kg
4	arroba				14.35 kg
100	25	libra			574 g
2000	500	20	onza		28.7 g
32,000	8000	320	16	adarme	1.79 g

145.25.2 Units of Liquid Capacity

For wine

				Metric
cántaro				15.75 L
8	azumbre			1.968 75 L
32	4	cuartillo		492.19 mL
128	16	4	copa	123.05 mL

145.25 Palencia

145.25.1 Units of Area

				Metric
obrada				5383.187 6 m ²
2	media obrada			2691.593 8 m ²
4	2	cuarto de obrada		1345.796 9 m ²
7704 ¹ / ₆	3852 ¹ / ₁₂	1926 ¹ / ₂₄	vara cuadrada	69.873 7 dm ²

For oil

				Metric
arroba				12.24 L
25	libra			489.6 mL
100	4	panilla		122.4 mL
400	16	4	onza	30.6 mL

145.26 Pontevedra

145.26.1 Units of Dry Capacity

For wheat

				Metric
fanega				62.320 L
4	ferrado			15.580 L
48	12	conca		1.298 3 L
96	24	2	curtillo	649.17 mL

For maize

				Metric
fanega				83.440 L
4	ferrado			20.860 L
56	14	conca		1.490 L
112	28	2	curtillo	745 mL

145.26.2 Units of Liquid Capacity

					Metric
moyo					130.800 L
4	cañado				32.700 L
8	2	cántaro			16.350 L
272	68	34	cuartillo		480.88 mL
4352	1088	544	16	onza or libra castellana	30.05 mL

Alternative scale

				Metric
moyo				180 L
12	cántaro			15 L
300	25	cuartillo		600 mL
6000	500	20	onza or libra gallega	30 mL

145.26.3 Units of Weight

					Metric
quintal					57.900 kg
4	arroba				14.475 kg
100	25	libra			579 g
2000	500	20	onza		28.95 g
32,000	8000	320	16	adarme	1.809 g

145.27 La Rioja Province (Present-Day La Rioja)

145.27.1 Units of Area

At Logroño

				Metric
fanega				1901.962 6 m ²
2	media fanega			950.981 3 m ²
2722	1361	vara cuadrada		69.873 1 dm ²
24,498	12,249	9	pie cuadrada	7.763 7 dm ²

145.27.2 Units of Dry Capacity

At Logroño

					Metric
cahiz					659.280 L
12	fanega				54.940 L
144	12	celemin			4.578 3 L
576	48	4	cuartillo		1.144 6 L
2304	192	16	4	ochavo	286.15 mL

145.27.3 Units of Liquid Capacity

At Logroño

					Metric
cántara or arroba					16.04 L
8	azumbre				2.005 L
32	4	cuartillo			501.25 mL
128	16	4	copa		125.31 mL

145.28 Salamanca

145.28.1 Units of Area

At Villagarcia

					Metric
yera					5022 m ²
8	cuarta				627.75 m ²
800	100	estadal			6.277 5 m ²
64,800	8100	81	pie cuadrada		7.75 dm ²

145.28.2 Units of Liquid Capacity

					Metric
cántaro					15.98 L
8	azumbre				1.997 5 L
32	4	cuartillo			499.375 mL
128	16	4	copa		124.848 mL

145.29 Segovia

145.29.1 Units of Area

						Metric
obrada ^a						3930.396 60 m ²
400	estadal cuadrado					9.825 99 m ²
5625	14 ³ / ₅₀	vara cuadrada				69.873 7 dm2
90,000	224 ⁴⁶ / ₅₀	16	palmo castellano cuadrado			4.367 1 dm ²
810,000	2024 ⁷ / ₂₅	144	9	pie castellano cuadrado		48.52 cm ²

^aAlso reported, by [DIRE], as 3940.700 6 m²

145.29.2 Units of Dry Capacity

						Metric
cahiz						655.20 L
12	fanega					54.60 L
144	12	celemin				4.55 L
576	48	4	cuartillo			1.137 5 L
2304	192	16	4	ochavo		284.375 mL

145.29.3 Units of Liquid Capacity

				Metric
arroba				16 L
8	azumbre			2 L
32	4	cuartillo		500 mL
128	16	4	copa	125 mL

145.30 Seville

145.30.1 Units of Length

					Metric
vara					835.905 mm
2	codo				417.952 5 mm
4	2	palmo			208.976 mm
8	4	2	octavo		104.488 mm
16	8	4	2	ava	52.244 mm

145.30.2 Units of Area

							Metric
fanega							5944.724 8 m ²
1¼	aranzada						4755.779 9 m ²
2	1⅓	media fanega					2972.362 4 m ²
2½	2	1¼	media aranzada				2377.889 95 m ²
8507 ¹³ / ₁₆	6806¼	4253 ²⁹ / ₃₂	3403⅜	vara cuadrada			69.873 72 dm ²
136,125	108,900	68,062½	54,450	16	palmo cuadrado		4.367 11 dm ²
1,225,125	980,100	612,562½	490,050	144	9	pie cuadrado	48.523 cm ²

145.30.3 Units of Dry Capacity

For grain during thefourteenth–fifteenth centuries, based on [CHIA]

					Metric
caffiso					633.36 L
9	quarta				70.37 L
12	1⅓	anco, anaco, or ancho			52.78 L
16	1⅞	1⅓	quarte		39.58 L
26	2⅞	2⅞	1⅞	Florentine staia	24.36 L

During the nineteenth century

						Metric
cahiz						656.40 L
12	fanega					54.70 L
24	2	media fanega				27.35 L
144	12	6	celemin			4.558 3 L
576	48	24	4	cuartillo		1.139 6 L
2304	192	96	16	4	ochavo	284.896 mL

145.30.4 Units of Liquid Capacity

For wine

						Metric
tomolo						939.60 L
60	arroba					15.66 L
480	8	azumbre or sombre				1.957 5 L
1920	32	4		cuartillo		489.37 mL
7680	128	16		4	copa	122.34 mL

For oil

						Metric
arroba mayor						12.563 L
2	media arroba mayor					6.281 5 L
4	2	cuarto de arroba mayor				3.140 75 L
42	21	10½		cuartillo		299.12 mL

Alternative scale for oil

						Metric
arroba menor or arroba pequeña						10.768 L
2	media arroba pequeña					5.384 L
4	2	cuarto de arroba pequeña				2.692 L
36	18	9		cuartillo		299.12 mL

145.31 Valladolid

145.31.1 Units of Area

During the nineteenth century, according to [DIRE]

						Metric
obra da						4658.247 8 m ²
600	estadal cuadrado					7.763 7 m ²
6666⅔	11⅔		vara cuadrada			69.874 dm ²

At Adalia

iguada			
4	quarta		
400	100	estadal cuadrado	
57,600	14,400	144	píe cuadrado

At Bamba

iguada			
4	quarta		
900	225	estadal cuadrado	
90,000	22,500	100	píe cuadrado

At Barcial de la Loma

iguada			
6	quarta		
600	100	estadal cuadrado	
51,337½	8556¼	85⅙	píe cuadrado

At Berrueces de Campos

iguada			
4	quarta		
400	100	estadal cuadrado	
72,900	18,225	182¼	píe cuadrado

At Bustillo de Chaves

iguada			
4	quarta		
400	100	estadal cuadrado	
44,100	11,025	110¼	píe cuadrado

At Cabreros del Monte in Valladolid

iguada			
6	quarta		
600	100	estadal cuadrado	
48,600	8100	81	píe cuadrado

At Castrodeza

iguada			
6	quarta		
600	100	estadal cuadrado	
60,000	10,000	100	píe cuadrado

At Castromembibre

				Metric
yera				3767 m ²
6	quarta			627.83 m ²
600	100	estadal		6.278 3 m ²
48,600	8100	81	píe cuadrada	7.751 dm ²

At Castromonte

iguada			
6	quarta		
600	100	estadal cuadrado	
54,150	9025	90¼	píe cuadrado

At Castroponce

iguada			
4	quarta		
400	100	estadal cuadrado	
62,500	15,625	156¼	píe cuadrado

At Cuenca de Campos

iguada			
4	quarta		
400	100	estadal cuadrado	
65,025	16,256¼	162⅙	píe cuadrado

At Gatón de Campos

iguada			
4	quarta		
400	100	estadal cuadrado	
78,400	19,600	196	píe cuadrado

At Matilla de los Caños

iguada			
4	quarta		
600	150	estadal cuadrado	
60,000	15,000	100	píe cuadrado

At Montealegre de Campos

iguada			
8	quarta		
800	100	estadal cuadrado	
80,000	10,000	100	píe cuadrado

At Morales de Campos in Valladolid

iguada			
6	quarta		
600	100	estadal cuadrado	
40,837½	6806¼	68⅞ ₁₆	píe cuadrado

At Palacios de Campos

iguada			
6	quarta		
600	100	estadal cuadrado	
65,104⅙	10,850 ⁹⁰ / ₇₂	108 ⁷³ / ₁₄₄	píe cuadrado

At San Cebrián de Mazote

iguada			
8	quarta		
800	100	estadal cuadrado	
64,800	8100	81	píe cuadrado

At Villabragma

iguada			
6	quarta		
600	100	estadal cuadrado	
43,350	7225	72¼	píe cuadrado

At Villalba del Alcor

iguada			
6	quarta		
600	100	estadal cuadrado	
72,600	12,100	121	píe cuadrado

At Villavarud

iguada			
8	quarta		
400	50	estadal cuadrado	
72,900	9112½	182¼	píe cuadrado

145.31.2 Units of Liquid Capacity

				Metric
cántaro				15.65 L
8	azumbre			1.956 25 L
32	4	cuartillo		489.06 mL
128	16	4	copa	122.26 mL

146 Cuba

Cuba was discovered by Christopher Columbus in 1492. By 1511, the Spanish had gained control of the island. Cuba was a Spanish colony, and was part of the Spanish West Indies, when a successful revolt broke out in 1895. The Spanish forces were defeated and a treaty ratified in 1899, establishing Cuba as an independent republic under U.S. protection. This protection lasted until 1902, and an independent Republic of Cuba was declared in 1902. The island returned to American rule from 1906 to 1909. A Communist regime was gradually established after the 1959 revolution.

The metric system has been official since 1858, and compulsory since 1960. During the late nineteenth century, old Spanish, U.S. and some local units were still in use.

Main sources: [BAUE], [MART3], and [ORIO]

146.1 Currency

1914–: 1 Cuban peso = 2½ cuarenta = 100 centavos

1899–1951: 1 US dollar = 100 cents

1899–1899: 1 Cuban peso = 100 centavos

1881–1899: 1 Cuban peso = 100 centesimos

1868–1881: 1 pesa = 100 centesimos

–1868: 1 peso = 8 reales de plata = 32 cuartillos = 100 centavos

146.2 Units of Length

1 legua legal = ~6646.15 varas = 5633.95 m.

Upper scale in Havana

							Metric
legua real							7064.166 667 m
-	legua						5651.333 333 m
3	—	milla marítima^a					2354.722 m
347 $\frac{7}{9}$	277 $\frac{7}{9}$	—	cordel				20.344 824 m
2083 $\frac{1}{3}$	1666 $\frac{2}{3}$	694 $\frac{2}{3}$	6	estadal			3.390 804 m
4166 $\frac{2}{3}$	3333 $\frac{1}{3}$	1388 $\frac{8}{9}$	12	2	braza, estado, or toesa		1.695 402 m
8333 $\frac{1}{3}$	6666 $\frac{2}{3}$	2777 $\frac{7}{9}$	24	4	2	vara^b	847.701 mm

^aOften used name for the British nautical mile = 1854.965 m

^bAlso reported as 847.717 mm [BAUE]

Middle scale in Havana

									Metric
vara									847.701 mm
1 $\frac{1}{2}$	codo de ribera								565.134 mm
2	1 $\frac{1}{3}$	codo							423.850 mm
3	2	1 $\frac{1}{2}$	pie						282.567 mm
4	2 $\frac{2}{3}$	2	1 $\frac{1}{3}$	palmo mayor					211.925 mm
6	4	3	2	1 $\frac{1}{2}$	gome				141.283 mm
8	5 $\frac{1}{3}$	4	2 $\frac{2}{3}$	2	1 $\frac{1}{3}$	colo			105.963 mm
12	8	6	4	3	2	1 $\frac{1}{2}$	palmo de ribera		70.642 mm
36	24	18	12	9	6	4 $\frac{1}{2}$	3	pulgada	23.547 mm

Lower scale in Havana

				Metric
vara				847.701 mm
36	pulgada			23.547 mm
432	12	linea		1.962 27 mm
5184	144	12	punto	163.522 μ m

New scale

							Metric
legua							4240 m
83 $\frac{1}{3}$	side of a besana						50.88 m
208 $\frac{1}{3}$	2 $\frac{1}{2}$	cordel					20.352 m
5000	60	24	vara				848.00 mm
15,000	180	72	3	pie			282.67 mm
180,000	2160	864	36	12	pulgada		23.56 mm

146.3 Units of Area

Upper scale in Havana

					Metric
caballeria					134,107. 127 4 m ²
20¼	fanega de tierra				6622.574 2 m ²
243	12	celemin de tierra			5.518 812 m ²
324	16	1⅓	cordel cuadrada		4.139 109 m ²
972	48	4	3	cuartillo de tierra	1.379 703 m ²

Lower scale in Havana

					Metric
cuartillo de tierra					137.970 3 m ²
12	estadal cuadrado				11.497 525 m ²
192	16	vara cuadrada			71.859 5 dm ²
1728	144	9	pie cuadrado		7.984 4 dm ²

New scale

						Metric
caballeria Cubana						1342.02 a
12	fanega					1118.35 a
18	1½	roza or rosa^a				7455.672 m ²
51 ^{21/25}	4 ^{8/25}	2 ^{23/25}	besana or mesana			2588.775 m ²
324	27	18	6¼	cordel cuadrada		414.204 m ²
186,624	15,552	10 368	3600	576	vara cuadrada	71.9 dm ²

^aAlso used as 10,000 varas cuadrada = 7190 m²

146.4 Units of Volume

1 **vara cubico** = 609.155 dm³. It was also reported as 609.191 dm³ [BAUE]

146.5 Units of Dry Capacity

Cadiz scale for general use

				Metric
cahiz				654.528 L
12	fanega			54.544 L
144	12	celemin or almud		4.545 333 L
576	48	4	cuartillo	1.136 333 L

For grain and salt, based on [BAUE]

						Metric	Metric
cahiz						1309.056 L	1104.24 kg
12	fanega					109.088 L	92.02 kg
48	4	cuartilla				27.272 L	23.005 kg
144	12	3	celemin			9.090 7 L	7.668 kg
576	48	12	4	cuartillo		2.272 7 L	1.917 kg
2304	192	48	16	4	ochavillo	568.17 mL	479.3 g

146.6 Units of Liquid Capacity

For wine and alcoholic beverages

						Metric
moyo						258.128 L
16	arroba or cantara^a					16.133 L
64	4	cuartilla				4.033 33 L
128	8	2	azumbre			2.016 667 L
512	32	8	4	cuartillo		504.167 mL
2048	128	32	16	4	copa	126.042 mL

^aAlso reported as about 15.90 L [BAUE]

For rum

		Metric
pipa		435.672 L
180	frasco	2.420 4 L

For honey, cognac and petroleum

				Metric	Metric
bocoy^a				136.275 L	138.027 9 kg
6	baril or barrile			22.712 L	23.004 6 kg
12	2	arroba		11.356 L	11.502 3 kg
36	6	3	gallon	3.785 L	–

^aFor general use = 662.4 L

Other measures reported during the nineteenth century:

- 1 **pipa** (for rum) = 476.96 L;
- 1 **barril** (for molasses) = 110 – 120 British wine gallons = 416.4 – 454.2 L;
- 1 **keg** (for molasses) = 5½ British wine gallons = 20.82 L;
- 1 **demijohn** (for Geneva) = 18 L;
- 1 **arroba** (for oil) = 12.563 L;
- 1 **pie de madera** or **de table de taller** = 2.360 L;
- 1 **taza** = 236 mL.

Metric-linked system

					Metric
aroba					15.5 L
4	cuartilla				3.875 L
8	2	azumbre			1.937 5 L
16	4	2	cuartillo		968.75 mL
64	16	8	4	copa	241.187 5 mL

Metric-linked system

				Metric
caneca				21.75 L
1½	garrafón			18.125 L
10	8½	frasco		2.175 L
30	25	3	botella	725.0 mL

146.7 Units of Weight

Traditional system

					Metric
tonelada					920.18 kg
20	quintal				46.009 kg
80	4	arroba			11.502 25 kg
2000	100	25	libra		460.009 g
32,000	1 600	400	16	onza	28.755 625 g

Other measures reported during the nineteenth century:

- 1 **tonelada larga española** = 1030.4 kg;
- 1 **ton** (for charcoal) = 1016.05 kg;
- 1 **tonelada larga** = 1015.65 kg;
- 1 **saco** (for sugar) = 250 libras = 115.023 kg;
- 1 **saco** (for coffee) = 90 kg;
- 1 **tercio** = 72.22 kg;
- 1 **bale** (for tobacco) = 135 – 140 lbs = 61.23 – 63.50 kg;
- 1 **hundredweight** (for sugar) = 50.80 kg;
- 1 **quintal** (for La Jara-tobacco) = 46 kg;
- 1 **arroba** (for coffee) = 23 libras = 10.58 kg;
- 1 **arroba** (for sugar) = 21½ - 22 libras = 9.89 – 10.12 kg.

Metric-linked system

										Metric
tonelada										920 kg
10	carga									92 kg
20	2	quintal								46 kg
80	8	4	arroba							11.5 kg
2000	200	100	25	libra						460 g
4000	400	400	50	2	marco					230 g
32,000	3200	1600	400	16	8	onça				28.75 g
512,000	51,200	25,600	6400	256	128	16	adarme			1.796 875 g
1,536,000	153,600	76,800	19,200	768	384	48	3	tomin		598.958 mg
18,432,000	1,843,200	921,600	230,400	9216	4 608	576	36	12	grano	49.913 mg

147 Curacao and Dependencies

See *Netherlands Antilles*.

148 Cyprus

Excavations have proved the existence of a Neolithic culture on this island in the fourth millennium BCE. The island was conquered by the Assyrian, Egyptian, Persian, Macedonian, Ptolemaic, Roman and Byzantine Empires. It was taken from Isaac Comnenus by Richard the Lionhearted in 1191, sold to the Knights Templar, and then ruled by the Franks and the Venetians, until Ottoman Turks conquered the island in late 1570. Cyprus was part of the Ottoman Empire until it was ceded to the British Empire in 1878, though the Turkish sultan remained sovereign. It was annexed by Britain in 1914, and became a crown colony in 1925. Cyprus gained its independence in 1960. In 1974, the Cyprus National Guard, under Greek officers, staged a coup. The northern part of Cyprus was invaded by Turkey in 1974. Southern Cyprus became a member of the European Union in 2004.

The British Imperial system for weights and measures became the only legal system in 1878. The metric system has been official since 1972, and compulsory since 1974.

Main sources: [DOUR], [ECON], [MART3], [ROBE4], and [UN66]

148.1 Currency

148.1.1 Southern Cyprus/Republic of Cyprus

2008–: 1 euro = 100 euro-cents
 1983–2007: 1 Cyprus pound = 100 cents
 1955–1983: 1 Cyprus pound = 1000 mils
 1914–1954: 1 Cyprus pound = 20 shillings = 180 piastres = 7200 para
 1879–1942: 1 Pound sterling = 20 shillings = 240 pence

148.1.2 Northern Cyprus

1974–: 1 Turkish lira = 100 kurus

148.2 Units of Length

For general use

			Metric
pic^a or pik			636.4 mm
2	Cypriot foot		318.2 mm
8	4	roupi or robi	79.6 mm

^aFor shoes = 671.80 mm, and for fabrics = 650.0 mm. [DOUR] reported 671.56 mm

British Imperial-linked system for fabrics

		Imperial	Metric
arsin, pic or pik		24 in	609.6 mm
8	roupi or robi	3 in	76.2 mm

Other reported measures:

1 **mile** (used in country areas) = 3 Imp. miles = 4 828.03 m.

148.3 Units of Area

British Imperial-linked system mainly used in Northern Cyprus

			Imperial	Metric
donum^a			14,400 ft ² = 1 600 yd ²	1337.803 776 m ²
4	evlek		3600 ft ²	334.450 944 m ²
60	15	pic	240 ft ²	22.297 296 m ²

^aIn the Southern part of Cyprus (the Republic of Cyprus), it was also referred to as a **skales** (σκάλες)

148.4 Units of Dry Capacity

Traditional system

							Metric
gomari or load							163.654 4 L
$2\frac{1}{4}$	medimno ^a						71.598 8 L
$4\frac{1}{2}$	2	kilé					36.367 6 L
16	7	$3\frac{3}{4}$	kouza				10.228 4 L
32	14	$7\frac{1}{2}$	2	kartos			5.114 2 L
$34\frac{22}{37}$	$15\frac{5}{37}$	$7\frac{2}{37}$	$2\frac{2}{37}$	$1\frac{3}{37}$	cass		4.730 635 L
128	56	$28\frac{4}{5}$	8	4	$3\frac{7}{10}$	oke or okka	1.278 55 L

^aAlso reported as 72.96 L and as 75.097 L

Other reported measures:

1 **kilé** (for corn) = 21 okes = 26.85 L;

1 **coffin** (for grains) = 19.76 L;

1 **cafisso** = 17.60 L.

148.5 Units of Liquid Capacity

Traditional system

			Metric
carica			10.414 000 L
16	guze		650.875 mL
64	4	boccale	162.719 mL

British Imperial-linked system, usually used for oil

						Imperial	Metric
gomari or load						36 gal	163.659 L
$4\frac{1}{2}$	kilé					8 gal	36.369 L
16	$3\frac{3}{4}$	kouza				2.25 gal	10.229 L
32	$7\frac{1}{2}$	2	kartos			1.12 gal	5.092 L
80	$11\frac{17}{45}$	$3\frac{1}{5}$	$1\frac{3}{5}$	Cyprus litre		2.8 qt	3.182 L
128	$28\frac{4}{5}$	8	4	$2\frac{1}{2}$	oke or okka	1.12 qt	1.273 L

Other reported measures:

1 **coriche** or **sonu** (for liquids) = 103.55 L;

1 **cass** = 4.731 600 L.

148.6 Units of Weight

Traditional system, based on [MART3]

					Metric
cantaro ^a					237.770 000 kg
100	rotolo				2.377 700 kg
$187\frac{1}{2}$	$1\frac{7}{8}$	oka			1.268 100 kg
1200	12	$6\frac{2}{5}$	vancheia		198.142 g
75,000	750	400	$62\frac{1}{2}$	dram	3.170 g

^aFor cotton = 180 oka = 228.258 000 kg

During the mid-nineteenth century

					Metric
cantaro					237.750 kg
100	rotolo				2.377 5 kg
200	2	oka			1.188 75 kg
1200	12	6	once		198.125 g
76,800	768	384	64	dram	3.095 7 g

Alternative scale, based on [ROBE4]

					Metric
cantaro					56.481 2 kg
22	rotolo				2.567 3 kg
44	2	oka			1.283 7 kg
176	8	4	onka or onje		320.916 g
1760	800	400	100	dram	3.209 g

British Imperial-linked upper system

					Imperial	Metric
ton					2240 lb	1016.05 kg
4	qantar^a				560 lb	254.012 kg
4 ⁹ / ₁₁	1 ¹ / ₉	qantar d'Aleppo^b			5 ⁵⁸⁹ / ₁₁ lb	228.611 kg
18 ² / ₁₁	4 ⁹ / ₁₁	4 ³ / ₁₁	qantar		124 lb	55.883 kg
20	5	4 ¹ / ₂	1 ¹ / ₁₀	moosa, moose, moosse, mosa, or mussa	112 lb	50.802 kg

^aFor fuel

^bFor carobs

British Imperial-linked lower system

					Imperial	Metric	[DOUR]
moosa, moose, moosse, mosa, or mussa					112 lb	50.802 kg	50.75 kg
8	stone				14 lb	6.350 kg	—
21 ¹ / ₃	2 ² / ₃	rotolo				2.381 25 kg	2.378 68 kg
40	5	1 ⁷ / ₈	oka or uqqa		2 lb 13 oz	1.270 058 636 kg	1.268 6 kg
16,000	2000	750	400	dram		3.175 g	3.171 6 g

149 Cyrenaica

See *Libya*.

150 Czech Republic [Former: Czechoslovakia]

The SI was adopted in 1980.
Main source: [CARD]

150.1 Currency

- 1993–: 1 Czech koruna = 100 haléřů
1945–1993: 1 Czechoslovak koruna = 100 haléřů
1939–1945: 1 German Reichmark = 100 Pfennig
1919–1939: 1 Czechoslovak koruna = 100 haléřů

150.2 Units of Length

1 **latro** = 1.917 m.

					Metric
mile					4381.02 m
3660	latro				1.917 m
3934 ¹ / ₂	129/120	Sah			1.113 m
11,803 ¹ / ₂	3 ³ / ₄₀	3	loket		371.1 mm
23,607	6 ³ / ₂₀	6	2	strevic	185.6 mm

150.3 Units of Area

				Metric
lan				~172,700 m ²
30	jitro			~5756.7 m ²
60	2	korec or strych ^a		~2878.3 m ²
86 ^{17/50}	1439/500	1439/1000	merice	~2000.2 m ²

^aThis is equal to the land area that could be sown with one strych of seed

150.4 Units of Volume

Some metric-linked measures:

1 **plometr** (for roundwood) = 1 m³;

1 **pinometer** = 1 m³.

150.5 Units of Liquid Capacity

Traditional system

		Metric
merice		~70.6 L
1 ^{3/4}	Strych	~51.3 L

150.6 Units of Weight

Metric-linked measure:

1 **custom quintal** (for hops) = 50 kg.

151 Czechoslovakia

See *Czech Republic*.

National Systems of Units and Currencies: D–G

1 Dahomey

See *Benin*.

2 Dalmatia

See also *Austria*, *Bosnia* and *Herzegovina*, *Croatia* and *Montenegro*.

The Kingdom of Dalmatia was formed from territories of the Illyrian Provinces in 1815. In 1918, most of the area became part of the State of Slovenes, Croats and Serbs and the Kingdom of Serbs, Croats and Slovenes.

Main sources: [MART3] and [ROTT2]

- 1 **rosghe** or **rosca** (at Omiš) = 2.434 14 m;
- 1 **pertica** or **hvat** (at Brač, Pag, Rab, Skradin and Zadar) = 2.434 14 m;
- 1 **rosghe** or **rosca** (at Trogir) = 2.318 23 m;
- 1 **pertica** (at Drniš) = 1.217 1 m;
- 1 **paliza** (in Lastovo) = 1.025 092 m;
- 1 **lakat** (for linen in Dubrovnic, based on [MART3]) = 683.396 mm;
- 1 **lakat** (for linen in Dubrovnic, based on [ROTT2]) = 681.918 mm;
- 1 **lakat** (for silk in Dubrovnic, based on [ROTT2]) = 637.598 mm;
- 1 **lakat** (for silk in Dubrovnic, based on [MART3]) = 638.721 mm.

2.1 Units of Length

In Dubrovnik before 1856, after 1856, and before 1876

		Metric	Metric	Metric
passo		2.046 532 m	2.050 740 m	2.050 187 m
4	lakat	511.633 mm	512.685 mm	512.547 mm

Some other reported measures:

- 1 **milja** (Vienna-linked system in Dubrovnic) = 1896.484 200 m;
- 1 **milja** (in Dubrovnik) = 1481.608 296 m;
- 1 **poplata** (at Korčula) = 2.521 1 m;

2.2 Units of Area

At Brač

		Metric
vretena		853.212 41 m ²
144	četvornih dokučiti	5.925 086 2 m ²

At Drniš, Šibenik and Skradin

		Metric
gognale		853.247 47 m ²
576	pertica dokučiti	1.481 33 m ²

At Knin and Šibenik

		Metric
gognale		915.200 m ²
576	Šibenik četvornih dokučiti	6.355 5 m ²

At Dubrovnik before 1856 and after 1856; before 1876, based on [MART3]

		Metric	Metric	Metric
soldo		1675.317 3 m ²	1682.213 8 m ²	1681.306 4 m ²
400	četvornih passo	4.188 293 2 m ²	4.205 534 5 m ²	4.203 266 m ²

At Hvar and Vis (Ventian scale)

		Metric
opera		435.313 17 m ²
100	Mletački četvornih dokučiti	4.353 131 7 m ²

At Omiš

		Metric
vretene		853.205 m ²
144	četvornih rosca	5.925 m ²

At Korčula

		Metric
gognale		915.200 m ²
144	četvornih poplate	6.355 5 m ²

Venetian scale at Makarska

		Metric
vretena		870.626 34 m ²
200	Mletački četvornih dokučiti	4.353 131 7 m ²

At Omis and Split; at Trogir

		Metric	Metric
vretena		853.212 41 m ²	773.890 8 m ²
144	četvornih rosghe	5.925 086 2 m ²	5.374 236 6 m ²

At Rab

		Metric
mina		592.508 62 m ²
100	četvornih dokučiti or pertica quadrata	5.925 086 2 m ²

At Pag, Skradin and Zadar

		Metric
gognale		2370.034 48 m ²
400	četvornih dokučiti	5.925 086 2 m ²
14,400	36 četvornih metara	16.458 57 dm ²

Some other reported measures:

1 **campo padovano** (at Pag, Skradin and Zadar) = 3656.630 6 m²;

1 **giornata di arare** (at Kotor in present-day Montenegro) = 1625.169 1 m²;

1 **variaciaco da semina** (at Fortopus, Pag, Skradin and Zadar) = 522.375 8 m².

2.3 Units of Volume

Some reported measures:

1 **carro** (for firewood in Brač and Korčula, $1\frac{3}{4} \times 1\frac{3}{4} \times 1\frac{3}{4}$ Venetian cubits) = 1.710 532 4 m³;

1 **carro** (for firewood in Split and Zadar, $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2}$ Venetian cubits) = 1.077 186 6 m³;

1 **cariche** (for firewood in Kotor, now part of Montenegro) = 126.314 4 dm³;

1 **fasci** (for firewood in Kotor, now part of Montenegro) = 56.841 1 dm³.

2.4 Units of Dry Capacity

In Brač, Comissa, Hvar and Vis before 1856 and after 1856

		Metric	Metric
quarta lessiniana		23.804 914 L	23.805 237 L
4	quartuzzi	5.951 228 L	5.951 309 L

At Drniš, Šibenik and Skradin

		Metric
quarta		35.346 7 L
4	variciachi	8.836 7 L

In Dubrovnik before 1856 and after 1856

		Metric	Metric
stajo		111.089 600 L	111.091 31 L
6	cupello	18.514 933 L	18.515 22 L
16	$2\frac{2}{3}$ baga	6.943 100 L	6.943 21 L

In Imotski, Makarska and Omiš before 1856 and after 1856

		Metric	Metric
quarta macarana		53.523 008 L	53.323 829 L
4	variciachi	13.380 752 L	13.330 957 L
24	6 bucare	2.230 125 L	2.221 826 L

In Knin before 1856 and after 1856

		Metric	Metric
quarta		35.346 69 L	35.346 928 L
4	variciachi	8.836 67 L	8.836 732 L

In Korčula

		Metric
quarta curzolana		11.902 457 L
4	quarterollo	2.975 614 L

In Kotor, now part of Montenegro

		Metric
cupello		20.829 3 L
4	quarterollo	5.207 3 L

In Obrovac and Zadar before 1856 and after 1856

		Metric	Metric
quarta		133.307 52 L	133.309 57 L
8	poluciachi	16.663 44 L	16.663 70 L

At Makarska and Omiš

		Metric
quarta		79.932 4 L
8	variciachi	9.991 55 L

In Pag

		Metric
metzen or moggio		333.268 8 L
8	mezzena	41.658 6 L

In Rab

		Metric
miica or mina		12.818 03 L
8	dixizze	1.602 25 L

In Sinj and Split before 1856 and after 1856

		Metric	Metric
quarta		79.932 437 L	79.933 48 L
8	variciachi	9.991 554 L	9.991 685 L

Some other reported measures:

- 1 **stajo** (in Dubrovnic, Lastovo, Vecchia and Slano after 1856) = 111.091 31 L;
- 1 **stajo** or **staja** (in Opuzen, Pag and Rab after 1856) = 83.318 33 L;
- 1 **staja** (at Narenta, now part of Bosnia-Herzegovina, after 1856) = 83.318 33 L.
- 1 **staja** (at Herceg Novi, now part of Montenegro) = 83.318 33 L;
- 1 **quarta** (in Trogir) = 76.929 548 L (before 1856) and 76.930 464 L (after 1856).

2.5 Units of Liquid Capacity

In Brač, Hvar, Trogir and Vis

		Metric
bačva		64.386 964 L
6	secchi	10.731 161 L
96	16 quartuzzi	670.697 5 mL

In Drniš, Fortopis, Imotski, Knin, Makarska, Neretva, Omiš and Opuzen

		Metric
bačva		64.386 964 L
6	secchi	10.731 161 L
108	18 quartuzzi	596.175 5 mL

In Herceg Novi and Kotor, now parts of Montenegro, and in Korčula

		Metric
bačva		64.386 964 L
75	canata	858.492 8 mL

At Imotski

		Metric
bačva		89.424 9 L
50	ocha	1.788 498 mL

Alternative scale in Makarska

		Metric
bačva		89.426 333 L
50	ocha	1.788 526 6 L

In Dubrovnik, Lastovo, Sabiocello, Šibenik, Skradin, Slano and Vrljka, based on [ROTT2] ad [MART3]

				Metric	Metric
bačva				64.386 964 L	64.385 900 L
6	secchio			10.731 16 L	10.730 983 L
84	14	quartuzzi or cuttli		766.511 5 mL	766.499 mL
104	17 $\frac{1}{3}$	1 $\frac{1}{21}$	cuttli piccolo	619.105 4 mL	–

At Obrovac, Rab and Zadar

			Metric
bačva			64.386 964 L
6	secchio		10.731 16 L
90	15	quartuzzi	715.410 7 mL

At Omiš

			Metric
bačva			64.39 L
6	secchio		10.73 L
108	18	quartuzzi	596 mL

In Sinj, Split and Verlicca

			Metric
bačva			68.411 149 L
6	secchio		11.401 858 L
108	18	quartuzzi	633.436 6 L

Some other reported measures:

1 **bačva** (in Poglizzo) = 85.513 936 L;
1 **bačva** (until 1856) = 64.386 964 L.

2.6 Units of Weight

At Dubrovnik

				Metric
oka ^a				1.303 001 kg
3 $\frac{1}{2}$	funta			372.286 g
42	12	onca		31.023 8 g
420	120	10	drahma	3.102 38 g

^aVaried between 1.336 and 1.272 kg

For gold and silver

						Metric
Mark						238.499 36 g
8	unca					29.812 42 g
32	4	četvrtina				7.453 105 g
192	24	6	denar			1.242 184 g
1152	144	36	6	Karat		207.031 mg
4608	576	144	24	4	žito	51.758 mg

Some other reported measures:

- 1 **bačva** (for wine in Dubrovnic) = 67.207 200 kg;
- 1 **bačva** (for brandy in Dubrovnic) = 62.726 720 kg;
- 1 **bačva** (for oil in Dubrovnic) = 60.486 480 kg;
- 1 **oka** (in Montenegro) = 1.500 kg;
- 1 **oka grossa** (in Obrovac, Šibenik, Split and Vrgorac) = 1.311 738 8 kg;
- 1 **oka communiale** (in Obrovac, Šibenik and Split) = 1.271 991 4 kg;
- 1 **funta** (in Obrovac, Šibenik and Split) = 12 oncia = 556.498 5 g;
- 1 **libbra grosso** (in Dalmatia) = 476.997 5 g;
- 1 **libbra sottile** (in Dalmatia) = 301.228 g;
- 1 **mark** (in Dubrovnic) = 221.804 440 g;
- 1 **onzia** (in Obrovac, Šibenik and Split) = 46.374 9 g;
- 1 **onzia** (in Dalmatia) = 39.750 g.

3 Danish Gold Coast

See also *Ghana* and *Swedish Gold Coast*.

This area was gradually annexed from Sweden between 1658 and 1787, and became a Danish crown colony in 1750. In 1850, all Danish settlements were sold to the British Gold Coast. The area is now part of Ghana.

Main source: [MART3]

3.1 Currency

- 1 bendo = 2 genuo = 4 gua = 16 cabses = 32 moeo = 64 pah or tabo = 128 boss
- 1 rigsdaler = 6 mark = 96 skilling

3.2 Units of Length

Some reported measures:

- 1 **jacktan** = 3.659 m;
- 1 **covado** = 577.5 mm.

3.3 Units of Capacity

Both dry commodities and liquids were sold by weight.

3.4 Units of Weight

Scale used by natives

				Metric
benda				64.120 g
2	benda-offa			32.060 g
4	2	engebba		16.030 g
8	4	2	ensanno	8.015 g

British Imperial-linked system for palm oil

		Metric
cru		20.865 232 kg
46	pund	453.592 g

For gold

		Metric
unse		20.396 g
16	acheh	1.274 75 g

4 Danish West Indies

See *Virgin Islands*.

5 Danzig

See also *Poland* and *Prussia*.

This city was part of Poland between 997 and 1308, when it became a territory of the Teutonic Order. In 1466, the town once again became part of Poland. Danzig was annexed to Prussia in 1793. Napoleon declared Danzig as a free city in 1807, but in 1815, it was again annexed to Prussia. In 1871, the city became part of the German Empire. The Allies took over control of the city in 1919, and the Free City of Danzig was established in 1920. Danzig was incorporated

into Germany in 1939, and then into Poland in 1945 under the name of Gdansk.

The Gdansk system of measurement became obsolete in 1816, when the Prussian system was introduced. The metric system has been compulsory since 1872.

Main sources: [DOUR], [HIRS], and [MART3]

Other reported measures:

1 **grosses Hundert** (for fish) = 6 Stich = 120;
Stich (for Fish) = 20.2

5.3 Units of Length

Before 1816

							Metric
Meile							7745.900 m
1800	Ruthe or pręt gdański						4.303 278 m
4500	2½	Klafter or sążeń					1.721 311 m
13,500	7½	3	Elle or łokieć				573.770 mm
27,000	15	6	2	Schuh or stópa			286.885 mm
324,000	180	72	24	12	Zoll or cale		23.907 mm
3,888,000	2160	864	288	144	12	Linie or linie	1.992 mm

5.1 Currency

1923–1939: 1 Danzig Gulden = 100 Pfennige
1920–1923: 1 Danzig Mark = 100 Pfennige
1872–1920: 1 German Mark = 100 Pfennige
1816–1872: 1 Prussian Thaler = 3 Gulden = 90 Groschen = 1 620 Pfennige
–1816: 1 Danzig Thaler = 3 Gulden = 30 Silbergroschen = 90 Groschen = 270 Schillinge = 1620 Pfennige

For yarn from Warmia

				Metric
Schock				112,032 m
60	Stück			1867.200 m
1200	20	Gebinde		93.360 m
48,000	800	40	Drade ^a	2.334 m

^aOne **Haspelfaden** (for threads of cotton and silk) = 3½ Prussian Elle = 2.334 279 m

5.2 Units of Quantity

For folding timber

				Metric
grosses Hundert Klappholz				2880
12	Ring			240
24	2	kleine Hundert		120
48	4	2	Schock	60

5.4 Units of Area

Before 1816

				Quadratschuh	Metric
Hufe				2025 000	740.572 12 m ²
1½	Hafen			1350 000	493.714 75 m ²
30	20	Morgen		67,500	24.685 74 m ²
9000	6000	300	Quadratruthe	225	8.229 44 dm ²

5.5 Units of Dry Capacity

For general use before 1816 and after 1816, based on [MART3]

						Metric	Metric	Metric
Last or laszt						3284.4 L	3297.6 L	3105.324 750 L
2½	Wispel					1313.76 L	1319.04 L	1242.129 900 L
5	2	Malter				656.88 L	659.52 L	621.064 950 L
60	24	12	Scheffel or korzec			54.74 L	54.96 L	51.755 412 L
240	96	48	4	Viertel or ćwierć		13.685 L	13.74 L	12.938 853 L
960	384	192	16	4	Metze or garniec gdański	3.421 25 L	3.435 L	3.234 713 L

For cereals

								Metric
Last^a								3688.998 L
–	Last^b							3381.581 L
1⅓	1⅒	Last^c						3074.165 L
–	–	1⅒	Last^d					2794.695 L
–	–	1⅓	–	Last^e				2673.187 L
–	–	60	–	–	Scheffel			51.236 L
–	–	240	–	–	4	Viertel		12.809 L
–	–	960	–	–	16	4	Metze	3.202 L

^aFor peas

^bFor wheat

^cFor linseed and buckwheat

^dFor barley

^eFor oats

For malt

					Metric
Grosse Last or Malzlast					48.639 L
1 $\frac{1}{8}$	Sackerlast				43.235 L
5 $\frac{5}{8}$	5	Malter			8.647 L
90	80	16	Scheffel		540.4 mL
1440	1280	256	16	Metze	33.78 mL

5.6 Units of Liquid Capacity

For wine before 1816, based on [HIRS], and after 1816, based on [MART3]

									Metric	Metric
Last									1685.298 000 L	1648.845 120 L
2	Fass or Fuber								842.549 000 L	824.422 560 L
4	2	Both or Sektpipe							421.324 600 L	412.211 280 L
4 $\frac{4}{5}$	2 $\frac{2}{5}$	1 $\frac{1}{5}$	Spanish Weinpipe						351.103 800 L	343.509 400 L
8	4	2	1 $\frac{1}{3}$	Oxhoft					210.662 280 L	206.105 640 L
12	6	3	2 $\frac{1}{2}$	1 $\frac{1}{2}$	Ohm				140.441 520 L	137.403 760 L
26 $\frac{2}{3}$	13 $\frac{1}{3}$	6 $\frac{2}{3}$	5 $\frac{1}{2}$	3 $\frac{3}{10}$	2 $\frac{1}{5}$	Loye^a			63.837 054 L	–
48	24	12	10	6	4	1 $\frac{1}{11}$	Anker		35.110 380 L	34.350 940 L
1440	720	360	300	180	120	54 $\frac{4}{11}$	30	Quart	1.170 346 L	1.249 125 L

^aFor wine from the Rhein Falls and Romania

For beer before 1816 and after 1816

				Metric	Metric
Last				1404.415 2 L	1374.037 600 L
6	Fass			234.069 2 L	229.006 267 L
12	2	Tonne		117.034 6 L	114.503 133 L
1200	200	100	Quart	1.170 346 L	1.145 031 L

5.7 Units of Weight

Before 1816

		Metric
Centner or cetnar		52.085 kg
120	Pfund or funt gdański	434.042 g

Between 1816 and 1858

								Metric
Schiffpfund								154.344 630 kg
3	Centner							51.448 210 kg
10	3 $\frac{1}{3}$	grosse Stein						15.434 436 kg
15	5	1 $\frac{1}{2}$	kleine Stein					10.289 642 kg
20	6 $\frac{2}{3}$	2	1 $\frac{1}{3}$	Liespfund				7.717 231 kg
330	110	33	22	16 $\frac{1}{2}$	Pfund			467.711 g
10,560	3520	1056	704	528	32	Loth		14.616 g
42,240	14,080	4224	2816	2112	128	4	Quentchen	3.654 g

6 Darfur

See also *Sudan*.

This area had been an independent Sultanate until it was taken over by Egypt in 1875. The Anglo-Egyptian government recognized Ali Dinar as the Sultan of Darfur in 1899. The British invaded and incorporated Darfur into the Anglo-Egyptian Sudan in 1916.

6.1 Currency

1 piastre

7 Delhi Sultanate (1206–1596)

See *India*.

8 Denmark

See also *Faroe Islands* and *Greenland*.

During the Viking Age, an empire around the North Sea was established by Knut den store. It included large parts of England and southern Norway, but the Empire did not survive its creator by many years, and its decay also marks the end of the Viking empire. During the Middle Ages, under the kings Valdemar Sejv and Valdemar Atterdag, the country included

conquered portions of the Baltic, Gotland, and northern Germany. In 1397, the Kalmar Union was formed by Queen Margaret I and her stepson Erik of Pomerania. This first effort to unite the Nordic countries into a single cohesive kingdom did not work out well, when the Union turned out to be only moderately popular, particularly in Sweden, which also left it upon Gustav Vasa's accession to the throne in 1523. From the formation of the Kalmar Union, Norway was annexed to the Danish Empire. In the mid-1600s, Denmark lost its Eastern provinces (Skåne, Halland and Blekinge) to Sweden. The Napoleonic War, in which Denmark was an ally of France, meant the end of the Danes' time in Norway. At the peace conference in Kiel in 1814, Norway became part of Sweden. After 1814, the Norwegian domains Faroe Islands, Greenland and Iceland officially became Danish. Iceland became an independent republic in 1944 and Greenland got extensive autonomy in 1979.

In the Middle Ages, Denmark was divided into smaller administrative units called Syssel. This was later also introduced in Norway, the Faroe Islands and Iceland. Nørrejylland was divided into Aabo, Almind, Hard, Himmer, Jelling, Lover, Ommer, Salling, Thy, Varde and Vend, Sønderjylland into Barvid, Ellum and Isted, and Sjælland into Medel, Øster, Sønder and Vester.

Before the late-seventeenth century, no weights and measures had been fixed by national regulation. In 1683 and 1698, King Christian V introduced a uniform measurement system in

Denmark and Norway. These regulations mandated, among other things, that the Danish *fod* would be equal to the Rhineland *fod*, which was about seven thousandths longer than the previous widely used *sjællandske* (Zealand) *fod*. In the period between 1820 and 1835, the foot had a different definition, which made it 0.354 million shares shorter. In 1835, the old *fod* was restored. In 1683, the *pund* had been set to equal 1/62 of the weight of one cubic *fod* of fresh water, but was, in 1839, redefined as 500 g. In 1861, i the decimal division of the *pund* was introduced. For various reasons, the decimal division of the length measurements were already in use by then. The metric system was adopted by law on May 4, 1907, and has been compulsory since 1910 and 1912.

Main sources: [AAKJ], [BRUU2], [FRII], [GLAM], [HÆGS], [KLEI], [MEYE], [NØRL], [PETE], [RASM], and [THES]

8.1 Currency

- 1873–:1 Danish krone = 100 øre
- 1854–1873:1 Danish rigsdaler = 96 skilling
rigsmønt
- 1813–1854:1 Danish rigsbankdaler =
96 rigsbank skilling
- 1625–1813:1 Danish rigsdaler = (1½ krone =)
6 mark specie = 64 skilling specie
= 768 pfennig
- 1544–1625:1 Danish ducat = 2 rigsdaler =
3 krone = 12 mark = 96 stuyver
= 192 skilling danske
= 384 fyrk = 576 hvid = 2304
pfennig

For fish and eggs

								Metric
tal								110
1⅔	ol							80
1⅙	1⅓	skok						60
2⅕	1⅔	1⅓	væt					50
2¼	2	1½	1¼	vedde				40
5½	4	3	1½	2	snes			20
7⅓	5⅓	4	3⅓	2⅔	1⅓	mandel		15
11	8	6	5	4	2	1½	vorde	10

- 1513–1544:1 Danish gulden = 3 krone =
24 marks = 128 skillings
- 1481–1513:1 Danish gulden = 32 skillings

8.2 Units of Quantity

- 1 **stort tusinde** = 1200;
- 1 **lille tusinde** = 1000;
- 1 **ring** = 240;
- 1 **tolf** (for horses) = 12;
- 1 **vrad** or **vråd** (for pigs) = 12;
- 1 **ring** (for planks) = 10;
- 1 **skok** (for sheaves) = 3 or 6;
- 1 **tal** = 6 (old) pigs;
- 1 **læg** = 6 pigs;
- 1 **kast** = 3 or 4 herrings;
- 1 **docka** (for embroidery cotton and silk yarn during the fourteenth to sixteenth centuries) = varying from one manufacturer to another.

For hides and skins during the thirteenth to nineteenth centuries

				Metric
schock				60
1½	zimmer or simmer			40
6	4	deger, døcher, dægge, or degger		10

For various commodities, as herring and eel

				Metric
ol, oll, or wall				80
2	timmer			40
4	2	snes or stieg		20

For pieces of money

			Metric
wall			80
1⅓	parti		60
20	15	kast or wurf	4
			Metric
gros			144
12	dusin, dutzend, or tylt		12
72	6	par	2

For paper sheets (writing paper and typing paper)

balle			
10	ris		
200	20	bog	
4800	480	24	ark skrivepapir (sheets of writing paper)
5000	500	25	ark trykpapir (sheets of typing paper)

For cows in Elsinore

		Metric
døcher		40
4	hide	10

8.3 Units of Length

Upper scale in Copenhagen between March 13, 1541 and May 1, 1683

									Metric
fjerdingsvej									1897.5 m
100	bolt								18.975 m
333⅓	3⅓	reb							5.692 m
500	5	1½	rode						3.795 m
1000	10	3	2	favn					1.898 m
3000	20	9	6	3	sjøllandsk alen^a				632.56 mm
6000	40	18	12	6	2	sjøllandsk fod			316.28 mm
12,000	80	36	24	12	4	2	kvarter		158.14 mm
24,000	160	72	48	24	8	4	2	håndsbred	79.1 mm

^aIn 1521, by a decree of Christian II, declared to be in legal use throughout the whole country

Lower scale in Copenhagen between March 13, 1541 and May 1, 1683

						Metric
håndsbred						79.10 mm
3	tomme or tol					26.357 mm
16	5⅓	bygkorn				4.940 mm
36	12	2¼	linje or strå			2.196 3 mm
432	144	27	12	skrupel		183 µm
5184	1728	324	144	12	qvinter	15 µm

Ole Rømer upper scale 1683–January 9, 1698

								Metric
fjerdingsvej								1884.12 m
333⅓	reb							5.652 36 m
500	1½	rode						3.768 24 m
1000	3	2	favn					1.884 12 m
3000	9	6	3	dansk alen				628.04 mm
6000	18	12	6	2	rhinlandsk fod			314.02 mm
12,000	36	24	12	4	2	kvarter		15.701 mm
24,000	72	48	24	8	4	2	håndsbred	78.505 mm

Lower scale between 1693 and 1698

						Metric
håndsbred						78.505 mm
3	tomme or tol					26.168 mm
16	5 $\frac{1}{3}$	bygkorn				4.906 6 mm
36	12	2 $\frac{1}{4}$	linje or strå			2.180 1 mm
432	144	27	12	skrupel		181.7 µm
5184	1728	324	144	12	qvinter	15.1 µm

Upper scale between 1698 (The ordinance of *January 10, 1698* redefined the rode as 5 alen) and 1820

								Metric
mil								7532.484 m
4	fjerdingsvej							1883.121 m
2400	600	rode						3.138 535 m
4000	1000	1 $\frac{1}{3}$	favn or skår					1.883 121 m
12,000	3000	5	3	rhinlandsk alen or skridt				627.707 mm
24,000	6000	10	6	2	rhinlandsk fod			313.853 5 mm
48,000	12,000	20	12	4	2	kvarter		156.926 7 mm
96,000	24,000	40	24	8	4	2	håndsbred	78.463 4 mm

Lower scale between 1698 and 1820

						Metric
håndsbred						78.463 4 mm
3	tomme or tol					26.154 5 mm
16	5 $\frac{1}{3}$	bygkorn				4.904 0 mm
36	12	2 $\frac{1}{4}$	linje or strå			2.179 5 mm
432	144	27	12	skrupel		181.6 µm
5184	1728	324	144	12	qvinter	15.1 µm

Upper scale between 1820 and June 3, 1835

										Metric
mil										7530.0 m
4	fjerdingsvej									1882.5 m
2400	600	rode								3.137 5 m
4000	1000	1⅔	favn							1.882 5 m
5142⅔	1 285⅔	2⅔	1⅔	doppelt skridt ^a						1.568 7 m
				2⅔	skridt					732.08 mm
12,000	3000	5	3	2½	1⅓	dansk alen or felles alen				627.50 mm
24,000	6000	10	6	5	2⅓	2	fod			313.75 mm
48,000	12,000	20	12	10	4⅔	4	2	kvarter		156.87 mm
96,000	24,000	40	24	20	9⅓	8	4	2	håndsbred	78.44 mm

^aAlso called **geometric skridt**

Lower scale between 1820 and June 3, 1835

						Metric
håndsbred						78.44 mm
3	tomme or tol					26.147 mm
16	5 $\frac{1}{3}$	bygkorn				4.902 5 mm
36	12	2 $\frac{1}{4}$	linje or strå			2.178 9 mm
432	144	27	12	skrupel		181.6 μ m
5184	1728	324	144	12	qvinter	15.1 μ m

Upper scale between 1835 (in order to harmonize with Prussian measures) and 1907

								Metric
mil								7532.484 m
4	fjerdingsvej							1883.121 m
40	10	kabellængde						188.312 1 m
2400	600	60	rode^a					3.138 535 m
4000	1000	100	1 $\frac{2}{3}$	favn				1.883 121 m
9600	2400	240	4	2 $\frac{2}{5}$	skridt^b			784.634 mm
12,000	3000	300	5	3	1 $\frac{1}{4}$	dansk alen or felles alen		627.707 mm
24,000	6000	600	10	6	2 $\frac{1}{2}$	2	preussisk fod	313.853 5 mm

^a[KLEI2, p. 66] reported 1 rode = 3.762 m

^b1 **doppelt skridt** or **geometric skridt** (used in the army and in surveying) = 5 fod = about 1.569 m

Lower scale between 1835 (in order to harmonize with Prussian measures) and 1907

							Metric
preussisk fod							313.853 5 mm
2	kvarter						156.927 mm
4	2	håndsbred					78.463 mm
12	6	3	tomme or tol				26.154 mm
144	72	36	12	linje or strå			2.179 mm
1728	864	432	144	12	skrupel		181.6 μ m
20,736	10,368	5184	1728	144	12	qvinter	15.13 μ m

Decimalized lower scale

					Metric
decimal fod					313.853 5 mm
10	decimal tomme				31.385 35 mm
100	10	decimal linje			3.138 535 mm
1000	100	10	decimal skrupel		313.853 5 μ m
10,000	1000	100	10	decimal qvinter	31.385 35 μ m

Some other *alen*-measures in use before the twentieth century:

- 1 **brabanter alen** (about 1650) = $1\frac{1}{9}$ sjællandske alen = about 702.9 mm;
- 1 **brabanter alen** (after 1820) = about 691.4 mm;
- 1 **jysk alen** = about 578 or 569 mm;
- 1 **lybsk alen** (about 1576) = $10/(11 + 1/40)$ sjællandske alen = about 573.8 mm;
- 1 **lybsk alen** (about 1650) = $9/10$ sjællandske alen = about 569.3 mm;
- 1 **lybsk alen** (about 1667) = about 575.1 mm;
- 1 **lybsk alen** (during the nineteenth century) = about 577 mm;
- 1 **lybsk alen** (as defined in 1907) = 575.2 mm;
- 1 **nürnberg artelleri alen** (about 1625) = about 584 mm;
- 1 **nürnberg alen** (about 1650) = $1\frac{1}{20}$ sjællandske alen = about 664.2 mm;
- 1 **nürnberg alen** (about 1820) = about 585.6 mm;
- 1 **nürnberg stadt alen** (after 1820) = about 607.6 mm;
- 1 **nürnberg wreck alen** (after 1820) = $11/12$ nürnberg stadt alen = about 557.0 mm;

- 1 **skovalen** (about 1650) = $6/7$ sjællandske alen + $1/7$ tomme = about 546.0 mm, but some sources say it was varying between 537.6 and 540.3 mm.

For maritime use:

- 1 **sømil, kvartsmil, or nautisk mil** = 1852 m.

8.4 Units of Area

Two distinct systems of agricultural land were used simultaneously. One type of unit, the *arealenheder*, was part of a traditional geometrical system, while the other type of unit, the *jordværedienheder*, was part of a system based on the land's productivity. As the *jordværedienheder* system served as the basis for calculation of taxes, its values varied depending on the manner in which the areas were cultivated, e.g., according to [MART3], the tønne hartkorn varied between 640 and 9600 kvadrat rode.

Because the systems measured different things, no conversion factor relating the two systems is possible. For example, one tønne of land might be worth as little as $1\frac{1}{2}$ tønne hartkorn, while a fertile toned piece of land could be rated at 22 tønne hartkorn.

Upper scale of the *arealenheds* system before 1683

				Metric
tønne land^a				5606.4 m ²
8	skæppe land			700.8 m ²
32	4	fjerdingskar land		175.2 m ²
96	12	3	album land	58.4 m ²

^aIt was equal to the amount of land area that could be planted with one tønne of seed

Lower scale of the *arealenheds* system before 1683

					Metric
kvadrat rode					14.402 m ²
36	kvadrat alen				40.006 dm ²
144	4	kvadrat fod			10.001 dm ²
20,736	576	144	kvadrat tomme		6.94 cm ²
2,985,984	82,944	20,736	144	kvadrat linje	4.83 mm ²

Upper scale of the *arealenheds* system 1683–1835

						Metric
tønde land						5523.84 m ²
8	skæppe land					690.48 m ²
32	4	fjerdingkar land				172.62 m ²
96	12	3	album land			57.54 m ²
384	48	12	4	penning land		14.385 m ²
560	70	17½	5⅙	1⅓ ₂₄	kvadrat rode	9.864 m ²

Lower scale of the *arealenheds* system 1683–1835

						Metric
kvadrat rod						9.864 m ²
25	kvadrat alen					39.456 dm ²
100	4	kvadrat fod				9.864 dm ²
14,400	576	144	kvadrat tomme			6.850 cm ²
2,073,600	82,944	20,736	144	kvadrat linje		4.756 mm ²

Upper scale of the *arealenheds* system after 1835

						Metric
tønde land						5516.225 12 m ²
8	skæppe land					689.528 14 m ²
32	4	fjerdingkar land				172.383 035 m ²
96	12	3	album land			57.460 678 m ²
560	70	17½	5⅙	kvadrat rode		9.850 402 m ²

Lower scale of the *arealenheds* system after 1835

						Metric
kvadrat rod						9.850 402 m ²
25	kvadrat alen					39.401 608 dm ²
100	4	kvadrat fod				9.850 402 dm ²
14,400	576	144	kvadrat tomme			6.840 557 cm ²
2,073,600	82,944	20,736	144	kvadrat linje		4.75 mm ²

Relations for the *jordværdienheds* system

bol					
2	plov				
4	2	fjerding			
8	4	2	otting		
16	8	4	2	tønde hartkorn	
64	32	16	8	4	tønde sædeland^a

^aIn the law of 1683, defined as 1 **tønde land** = 14,000 kvadrat alen

Several commentators give an area for the tønne hartkorn and its subdivisions during the nineteenth century. [KLIM, p. 386] reported that an order of January 20, 1788, made the tønne hartkorn 2.83 ha, 5.66 ha in wooded areas, 1.935 ha in Bornholm, 5.5 ha in the islands and 14.5 ha in Jutland.

Jordværedienheds system in 1840, based on [DOUR]

								Metric
plov or pflug								176,519.193 6 m ²
8	tønne hartkorn^a							22,064.899 2 m ²
16	2	tønne havre						11,032.449 6 m ²
32	4	2	tønne sædeland					5516.224 8 m ²
64	8	4	2	skæppe hartkorn^b				2758.112 4 m ²
256	32	16	8	4	fjerdingkar			689.528 1 m ²
768	96	48	24	12	3	album		229.842 7 m ²
3072	384	192	96	48	12	4	penning	57.460 7 m ²

^aOne tønne of land might have been worth as little as 2 tønne hartkorn, while a very fertile land area might have been rated as being 20 tønne hartkorn

^bThe amount of land area that would be sown by one skæppe of barley or rye, or two skæpper of oats

Jordværedienheds system in 1883, based on [MART3]

							Metric
pflug							226,953.262 08 m ²
8	tønne hartkorn						28,369.157 76 m ²
64	8	skæpper hartkorn					3546.144 72 m ²
256	32	4	fjerdingkar hartkorn				886.536 18 m ²
768	96	12	3	album hartkorn			295.512 06 m ²
23,040	2880	360	90	30	kvadrat rode		9.850 402 m ²

At Tønder (part of Prussia between 1864 and 1920)

			Metric
demat or Demath			4789.4 m ²
180	kvadrat rode or Quadratrute		26.608 m ²
58,320	324	kvadrat fod or Quadratfuss	8.212 dm ²

8.5 Units of Volume

For wood

			Metric
favn			2612.388 m ³
1 ² / ₁₄₄	favn brænde ^a		2225.940 m ³
84½	72	kubik fod	30.915 8 m ³

^aFor firewood

Other measures:

- 1 **skakt** (for earth) = $6 \times 6 \times \frac{1}{2}$ alen = 18 kubik alen = ~ 4.45 m³ (after 1835);
 1 **skogstig** (for charcoal) = 2 m³.

For herring

			Metric
læst sild			1298.462 592 L
12	sildetønde		108.205 216 L
1344	112	pot	966.118 mL

For hay:

1 **læs** = a cartload. There were both **bondelæs** (= farmer's cartload) and **borgerlæs** (= burghess cartload).

1 **rylte** = $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{3}{4}$ laes.

8.6 Units of Dry Capacity

Upper scale for cereals from 1683 until 1907

						Metric
læst korn ^a						3060.661 824 L
22	korntønde or tønde matkorn ^a					139.120 992 L
44	2	halv tønde				69.560 496 L
88	4	2	kvalt tønde			34.780 248 L
176	8	4	2	skæppe or otting		17.390 124 L
3168	144	72	36	18	pot ^b	966.118 mL

^aFor barley. Also reported as **metkorn-tønde**

^bThe pot has also reported, by [MART3], as equal to 1/32 kubik fod = 966.119 727 259 23 mL

Lower scale for cereals from 1683 until 1907

						Metric
skæppe or otting						17.390 124 L
4	fjerdingskar or fjerdæl					4.347 531 L
8	2	ottingkar, achtel, or ottendel ^a				2.173 765 L
16	4	2	halvottingkar or sextendel			1.086 883 L
18	4½	2¼	1⅛	pot		966.118 mL
72	18	9	4½	4	pægel	241.529 mL

^aAlso for potatoes

For charcoal

					Metric
læst kul					3060.661 824 L
18	tønde kul				170.037 768 L
324	18	kulmål			9.446 487 L
353⅔ ₁₁	19⅔ ₁₁	1⅙ ₁₁	kultønde		8.659 280 L
3168	176	9⅔	8 ²⁶ / ₂₇	pot	966.118 mL

	Period	
1 læs (by decree)	1716–1727	30 lispund
1 læs (by army fodder purchase)	1745–1799	32 lispund
1 læs (by estate account books)	1789–1792	32 lispund
1 stor læs (by the Chief of police in Copenhagen)	1802	36 lispund
1 lille læs (by the Chief of police in Copenhagen)	1802	24 lispund

For various types of commodity, based on [FRII]:

1 **last** (for flaxseed and hempseed, as reported in 1647) = 24 tønner;

1 **last** (for rye and wheat, as reported in 1632) = 22 tønner;

1 **last** (for coal) = 18 tønner;

1 **last** (for apples, beans, bread, butter, cement, cured fish, cured meat, eel, flaxseed, flour, groats of buckwheat, hempseed, juniper berries, mead, nuts, peas, rape and beet, soap, steel, and wood ashes) = 12 tønner;

For barley in Nordjylland from 1602 to 1683

					Metric
last					3465.792 L
12	pund				288.816 L
15	$1\frac{1}{4}$	ørtug			231.052 8 L
24	2	$1\frac{3}{5}$	tønne		144.408 L
180	15	12	$7\frac{1}{2}$	settingsskæppe	19.254 4 L

For oats in Nordjylland from 1602 to 1683

					Metric
last					6931.584 L
12	pund				577.632 L
18	$1\frac{1}{2}$	ørtug			385.088 L
48	4	$2\frac{2}{3}$	tønne		144.408 L
360	30	20	$7\frac{1}{2}$	settingsskæppe	19.254 4 L

For rye in Nordjylland from 1602 to 1683

					Metric
last					3465.792 L
12	pund				288.816 L
18	$1\frac{1}{2}$	ørtug			192.544 L
24	2	$1\frac{1}{3}$	tønne		144.408 L
180	15	10	$7\frac{1}{2}$	settingsskæppe	19.254 4 L

For grain in Aabo before 1683

					Metric
korntønne					143.75 L
8	skæppe				17.97 L
32	4	fjerdingskar			4.49 L
62	$7\frac{3}{4}$	$1\frac{15}{16}$	ottingkar		2.318 L
$148\frac{1}{2}$				pot	968 mL

For barley in Østjylland and Fyn from 1602 to 1683

					Metric
last					5198.688 L
12	pund				433.224 L
24	2	ørtug			216.612 L
36	3	1½	(Aabo)tønde		144.408 L
288	24	12	8	(Aabo)skæppe	18.051 L

For oats in Østjylland and Fyn from 1602 to 1683

					Metric
last					8664.48 L
12	pund				722.040 L
24	2	ørtug			361.020 L
60	5	2½	(Aabo)tønde		144.408 L
480	40	20	8	(Aabo)skæppe	18.051 L

For rye in Østjylland and Fyn from 1602 to 1683

					Metric
last					4332.24 L
12	pund				361.020 L
24	2	ørtug			180.510 L
30	2½	1¼	(Aabo)tønde		144.408 L
240	20	10	8	(Aabo)skæppe	18.051 L

For oats in Sjælland from 1602 to 1683

						Metric
last						866.448 L
12	pund					72.204 L
24	2	ørtug				36.102 L
80	6⅔	3⅓	tønde			10.830 6 L
96	8	4	1⅓	(small) tønde		9.025 5 L
480	40	20	6	5	skæppe	1.805 1 L

For rye in Sjælland from 1602 to 1683

						Metric
last						5198.688 L
12	pund					433.224 L
24	2	ørtug				216.612 L
40	3⅓	1⅓	tønde			129.967 2 L
48	4	2	1⅓	(small) tønde		108.306 L
240	20	10	6	5	skæppe	21.661 2 L

For barley and rye in Skåne from 1602 to 1683

					Metric
last					5776.321 L
12	pund				481.360 L
24	2	ørtug			240.680 L
40	3 $\frac{1}{3}$	1 $\frac{1}{3}$	(Åbo)tønde		144.408 L
240	20	10	6	skæppe	24.068 L

For barley in Bjerre and Luggude areas in Skåne from 1602 to 1683

					Metric
last					6931.584 L
12	pund				577.632 L
28 $\frac{4}{5}$	2 $\frac{2}{5}$	ørtug			240.680 L
48	4	1 $\frac{1}{3}$	(Åbo)tønde		144.408 L
288	24	10	6	skæppe	24.068 L

For oats in Skåne from 1602 to 1683

					Metric
last					11,552.640 L
12	pund				962.720 L
24	2	ørtug			481.360 L
80	6 $\frac{2}{3}$	3 $\frac{1}{3}$	(Åbo)tønde		144.408 L
480	40	20	6	skæppe	24.068 L

For barley in Sydjylland from 1602 to 1683

					Metric
last					5198.688 L
24	ørtug				216.612 L
32	1 $\frac{1}{3}$	tønde			162.459 L
288	12	9	(Åbo)skæppe		18.051 L

For oats in Sydjylland from 1602 to 1683

					Metric
last					8664.48 L
24	ørtug				361.020 L
53 $\frac{1}{3}$	2 $\frac{2}{3}$	tønde			162.459 L
480	20	9	(Åbo)skæppe		18.051 L

For rye in Sydjylland from 1602 to 1683

					Metric
last					4332.24 L
24	ørtug				180.510 L
26 $\frac{2}{3}$	1 $\frac{1}{3}$	tønde			162.459 L
240	10	9	(Åbo)skæppe		18.051 L

For barley in Vestjylland from 1602 to 1683

					Metric
last					4158.950 4 L
12	pund				346.579 2 L
24	2	ørtug or tønde			173.289 6 L
288	24	12	tiendelskæppe		14.440 8 L

For oats in Vestjylland from 1602 to 1683

					Metric
last					6931.584 L
12	pund				577.632 L
24	2	ørtug			288.816 L
48	4	2	tønde		144.408 L
480	40	20	10	tiendelskæppe	14.440 8 L

For rye in Vestjylland from 1602 to 1683

					Metric
last					3465.792 L
12	pund				288.816 L
24	2	ørtug or tønde			144.408 L
240	20	10	tiendelskæppe		14.440 8 L

For salt^a from 1683 to 1698

					Metric
tønde salt					170.037 768 L
8	skæppe salt				21.254 596 L
64	8	ottingkar			2.656 824 L
176	22	2 $\frac{1}{4}$	pot		966.118 mL

^aAccording to [FRII, p. 130]: 1 **last** (for salt from France, Scotland and Spain) = 18 tønder, but 1 **last** (for salt from Denmark, Norway and Lüneberg) = 12 tønder

For salt from 1698 to 1778

					Metric
tønde salt					173.901 240 L
10	kornskæpper				17.390 124 L
180	18	pot			966.118 mL

Other reported measures:

- 1 **rode** (for soil) = $6 \times 6 \times 6$ sjællandske alen = 54.671 m^3 , later said to equal $8 \times 8 \times 1$ sjællandske alen = 16.20 m^3 ;
- 1 **drøm** (for hops) = 495 potter = 478.23 L;
- 1 **kalktønde** (for lime) = 255.055 L;
- 1 **kultønde** (for charcoal) = 176 potter = about 170.037 L;
- 1 **øltønde** (for flour, butter, tallow, soap, pork and fish) = 131.392 L;
- 1 **tjæretønde** (for tar) = 120 potter = about 115.934 L;
- 1 **tønde sild** (for herring) = 112 potter = about 108.205 L;
- 1 **balje** (for herring after 1719) = 38 potter = 36.8 L;
- 1 **bimpel** (for sand eels, in Skåne (now part of Sweden), during the seventeenth to eighteenth centuries) = 19 L;
- 1 **ask** (for butter at Århus) = 13.9 L;
- 1 **ask** (for butter at Hardsyssel) = 1/6, 1/9, 1/10, or 1/12 tønde = 11.59–23.19 L;
- 1 **ask** (for butter at Himmerland) = 1/12 tønde = 11.6 L;
- 1 **ask** (for butter at Salling) = 1/9 or 1/12 tønde = 11.59–15.46 L;
- 1 **bänne** or **bende** (for fish, at Malmö (now part of Sweden), during the sixteenth century) = a wicker basket of unknown size, usually used for fish;
- 1 **bark** (during the late seventeenth century) = unknown size.

8.7 Units of Liquid Capacity

Old scale for beer, ale, and vinegar before 1683

				Metric
oksehoved				171.2 L
1½	øltønde			114.1 L
6	4	anker or anker øl		28.5 L
180	120	30	pot	951 mL

Scale for beer, ale, and vinegar after 1683

				Metric
oksehoved				199.8 L
1½	øltønde			133.2 L
6	4	anker or anker øl		33.3 L
210	140	35	pot	951 mL

New scale for beer, ale, and vinegar after 1698

				Metric
oksehoved				197.5 L
1½	øltønde			131.7 L
6	4	anker or anker øl		32.9 L
240	160	40	pot	823 mL

Scale for wine reported in 1647, according to [FRII]

				Metric
oksehoved				232.5 L
1½	ahm or ame			155 L
6	4	anker or anker vin		38.7 L
240	160	40	pot	969 mL

For wine before 1683

				Metric
oksehoved				228 L
6	anker or anker vin			38.0 L
12	2	bimpel		19.0 L
240	40	20	pot	950 mL

For wine, as stated by May 1, 1683

				Metric
amme ^a				149.75 L
4	anker			37.44 L
8	2	bimpel		18.72 L
155	38¾	19⅞	pot	966 mL

^aAlso reported as **ame**, **ahm** and **ohm**

For beer after 1683

								Metric
læst ^a								1576.704 576 L
6	ølfad							262.784 096 L
12	2	øltønde						131.392 048 L
24	4	2	halvtønde					65.696 024 L
48	8	4	2	fjerdingskar or ølanker				32.848 012 L
96	16	8	4	2	ottingkar or halvanker ^a			16.424 006 L
192	32	16	8	4	2	sextingkar		8.212 003 L
1632	272	136	68	34	17	8½	pot	966.118 mL

^aAlso for herring, oil, and butter

For wine after 1698

				Metric
amme ^a				150.71 L
4	anker			37.68 L
8	2	bimpel ^b		18.84 L
156	39	19½	pot	966 mL

^aAlso reported as **ame**, **ahm** and **ohm**^bIn 1773, also reported as a measure for tar

Upper scale for wine after 1698 (1 anker was often = 40 potter)

							Metric
vinfad							927.473 L
2	pibe						463.737 L
4	2	oksehoved					231.868 L
6	3	1½	ahm, amme, åm, or tierzen				154.579 L
6⅔ ₃₁	3⅔ ₃₁	1⅞ ₃₁	1⅓ ₃₁	spand			149.748 L
24	12	8	4	3⅞	anker		38.644 7 L

Middle scale for wine after 1698 (1 anker was often = 40 potter)

						Metric
anker						38.644 7 L
1½	kubikfod					30.915 8 L
2½	2	bimpel				15.457 9 L
5	4	2	viertel			7.728 9 L
40	32	16	8	pot ^a		966.118 mL

^aThe pot has also reported, by [MART3], as equal to 1/32 kubik fod = 966.119 727 259 23 mL

Lower scale for wine after 1698

							Metric
stob, stobiken, støfken, or stubchen							3.864 5 L
2	kande						1.932 2 L
4	2	pot					966.118 mL
5⅓	2⅔	1⅓	flaske				724.588 mL
16	8	4	3	pægl			241.529 mL
32	16	8	6	2	halvpægl		120.765 mL

For wine during the early nineteenth century, based on [DOUR]

				Metric
stubbchen				3.743 L
$3\frac{3}{8}$	pot			965.93 mL
$15\frac{1}{2}$	4	pægl		241.48 mL
31	8	2	halvpægl	120.74 mL

For wine in Copenhagen during the late eighteenth century

							Metric
foder							898.40 L
2	pibe						449.20 L
4	2	oxehoved					149.73 L
6	3	$1\frac{1}{2}$	ahm or ohm				99.82 L
24	12	6	4	anker			24.96 L
120	60	30	20	5	viertel		4.99 L
930	465	$232\frac{1}{2}$	155	$38\frac{3}{4}$	$7\frac{3}{4}$	pot	644 mL

For wine in Copenhagen during the mid-nineteenth century

								Metric
toldfoder								1854.946 560 L
2	foder							927.473 280 L
4	2	pibe						463.736 640 L
8	4	2	oxehoved					231.868 320 L
12	6	3	$1\frac{1}{2}$	ahm or ohm				154.578 880 L
48	24	12	6	4	anker			36.644 720 L
240	120	60	30	20	5	viertel		7.728 944 L
1920	960	480	480	160	40	8	pot	966.118 mL

For wine in Copenhagen in 1866, based on [MART3]

											Metric
stykfad											1123.112 175 L
$1\frac{1}{4}$	fad										898.489 740 L
$2\frac{1}{2}$	2	pibe									449.244 870 L
5	4	2	oxehoved								224.622 435 L
$7\frac{1}{2}$	6	3	$1\frac{1}{2}$	ahm or ohm							149.748 290 L
30	24	12	6	4	anker						37.437 072 L
150	120	60	30	20	5	viertel					7.487 414 L
$581\frac{1}{4}$	465	$232\frac{1}{2}$	$116\frac{1}{4}$	$77\frac{1}{2}$	$19\frac{3}{8}$	$3\frac{3}{8}$	kande				1.932 236 L
$1162\frac{1}{2}$	930	465	$232\frac{1}{2}$	155	$38\frac{3}{4}$	$7\frac{3}{4}$	2	pot			966.118 mL
1550	1240	620	310	$206\frac{2}{3}$	$51\frac{2}{3}$	$10\frac{1}{3}$	$2\frac{2}{3}$	$1\frac{1}{3}$	flaske		724.588 5 mL
4650	3720	1860	930	620	155	31	8	4	3	pægel	241.529 5 mL

In Helsingør, based on [MART3]

							Metric
fad							927.474 938 L
2	pipe						463.737 469 L
4	2	oxehoved					231.868 734 L
6	3	1½	ame				154.579 156 L
24	12	6	4	anker			38.644 789 L
120	60	30	20	5	fyrstel		7.728 958 L
960	480	240	160	40	8	pot	966.120 mL

For honey before 1683

				Metric
tønde hønning				139.4 L
4	fjerdning			34.85 L
8	2	otting		17.42 L
144	36	18	pot	968 mL

For honey in Aabo before 1683

					Metric
tønde					139.4 L
7½	ask				18.59 L
30	4	kande			4.647 L
60	8	2	stob		2.323 L
120	16	4	2	pot	1.162 L

For honey in Vendsyssel before 1683

					Metric
tønde					139.4 L
6	ask				23.23 L
24	4	kande			5.808 L
48	8	2	stob		2.904 L
96	16	4	2	pot	1.452 L

For honey in Hals before 1683

					Metric
tønde					139.4 L
8½	ask				16.40 L
34	4	kande			4.100 L
68	8	2	stob		2.050 L
136	16	4	2	pot	1.025 L

Other measures reported during the seven-teenth to nineteenth centuries:

- 1 **last** (for lard and train-oil, as reported in the 1640s) = 8 hogsheads;
- 1 **last** (for beer, Danish brandy, honey, linseed oil, and vinegar) = 12 tønnder or 8 ahms;
- 1 **last** (for wine, as reported in 1732) = 2 casks;
- 1 **øltønde** (for oil, honey, whale oil and cod liver oil after 1683) = 136 potter = 131.5 L;
- 1 **trantønde** or **tjæretønde** (for whale-oil and tar; also used for spirits in trade with Iceland) = 115.90 L;
- 1 **ask** (for hunny in Jylland) = 9.79 L (before 1683) and 7.73 L (after 1683);.
- 1 **bæger** (for tar during the seventeenth century) = unknown magnitude.

8.8 Units of Weight

For hops (pressed and measured) in Lübeck before 1683

				Metric	Metric
Lybsk drømt				383.4 L	31.7 kg
4	lispund			95.85 L	7.9 kg
16	4	Sjællandsk skæpper		24.0 L	2.0 kg
24	6	1½	røffel	16.0 L	1.3 kg

For hops (pressed and measured) in Rostock before 1683

				Metric	Metric
drømt				479.2 L	39.6 kg
5	lispund			95.8 L	7.9 kg
20	4	Sjællandsk skæpper		24.0 L	1.98 kg
24	4 $\frac{1}{2}$	1 $\frac{1}{2}$	røffel	20.0 L	1.65 kg

For hops (pressed and measured) in Wismar before 1683

				Metric	Metric
drømt				431.3 L	35.78 kg
4 $\frac{1}{2}$	lispund			95.8 L	7.95 kg
18	4	Sjællandsk skæpper		24.0 L	1.99 kg
24	5 $\frac{1}{3}$	1 $\frac{1}{3}$	røffel	18.0 L	1.49 kg
72	16	4	3 skaalpund	6.0 L	497 g

For copper before 1683 and after 1683

		Metric	Metric
skippund		158.48 kg	160.02 kg
14	skive	11.32 kg	11.43 kg

Lybske væktsystem used before 1683

							Metric
skippund							135.72 kg
20	lispund						6.786 kg
280	14	pund					484.71 g
560	28	2	mark				242.35 g
4480	224	16	8	unze			30.29 g
8960	448	32	16	2	lod		15.15 g
35,840	1792	128	64	8	4	qvintin or kvintin	3.79 g

Det tunge vægtsystem used before 1683

							Metric
skippund							158.464 kg
2 $\frac{7}{8}$	centner						55.462 kg
15 $\frac{5}{21}$	5 $\frac{1}{3}$	sten					10.399 kg
20	7	1 $\frac{49}{144}$	lispund				7.923 kg
22 $\frac{1}{2}$	7 $\frac{7}{8}$	1 $\frac{61}{128}$	1 $\frac{1}{8}$	letpund			7.043 kg
320	112	21	16	14 $\frac{7}{9}$	skaalpund		495.2 g
640	224	42	32	28 $\frac{7}{9}$	2	mark	247.6 g

Det lette vægtsystem used before 1683

							Metric
skaalpund							495.2 g
2	mark						247.6 g
16	8	unse					30.95 g
32	16	2	lod				15.47 g
128	64	8	4	quintin or kvintin			3.87 g
512	256	32	16	4	ort		967 mg

Kølnerpund system (based on the mark of Cologne) before 1683

					Metric
kølnerpund					467.71 g
2	mark				233.85 g
16	8	unse			29.23 g
32	16	2	lod		14.62 g
128	64	8	4	quintin or kvintin	3.65 g

Bismersystem before 1683

					Metric
vaag, vog, waag, weg, or wog					17.827 kg
3	bismerpund				5.942 kg
6	2	kors			2.971 kg
36	12	6	skaalpund		495.2 g
72	24	12	2	bismermark	247.6 g

Copenhagen scale before 1683 (A statute of March 31, 1615 required the use of the Copenhagen *skålpund* throughout Denmark)

										Metric
vog, wog, or waag										17.890 kg
3	bismerpund									5.963 kg
36	12	skaalpund^a								496.94 g
72	24	2	mark							248.47 g
576	192	16	8	unze						31.06 g
1152	384	32	16	2	lod					15.53 g
4608	1536	128	64	8	4	qvintin or kvintin				3.88 g
18,432	6144	512	256	32	16	4	ort			970.6 mg
329,472	109,824	9152	4576	572	286	71½	17⅞	es or as		54.3 mg
2,635,776	878,592	73,216	36,608	4576	2288	572	143	8	gran	6.8 mg

^aDefined as the weight of 1/62 kubik fod of water

Upper scale in Copenhagen after 1683, based on [MART3]

							Metric
læst							2596.406 800 kg
16¼	skippund						159.778 880 kg
52	3⅓	centner					49.930 900 kg
144⅞	8⅞	2⅞	vog				17.975 124 kg
325	20	6¼	2¼	lispund			7.988 944 kg
433⅓	26⅔	8⅓	3	1⅓	bismerpund		5.991 708 kg
5200	320	100	36	16	12	pund	499.309 g

Scale in Copenhagen after 1683, based on [MART3]

							Metric
pund							499.309 g
16	unze						31.206 812 g
32	2	lod					15.603 406 g
128	8	4	kvintin				3.900 852 g
512	32	16	4	ort			975.213 mg
8192	512	256	64	16	es		60.951 mg
65,536	4096	2048	512	128	8	gran	7.619 mg

Scale after 1683 (decree of May 1, 1683)

											Metric
commercelæst or skiblast ^a											2598.44 kg
16¼	skippund										159.904 kg
52	3½	centner									49.97 kg
325	20	6¼	lispund								7.995 kg
5200	320	100	16	skaalpund							499.7 g
10,400	640	200	32	2	mark						249.8 g
83,200	5120	1600	256	16	8	unze					31.2 g
166,400	10,240	3200	512	32	16	2	lod				15.6 g
665,600	40,960	12,800	2048	128	64	8	4	qvintin			3.9 g
2,662,400	163,840	51,200	8192	512	256	32	16	4	ort		976 mg
42,598,400	2,621,440	819,200	131,072	8192	4096	512	256	64	16	es or as	61 mg

^aUsed in the shipping industry

Scale after 1698 (decree of January 10, 1698)

											Metric
commercelæst or skiblast											2579.20 kg
16¼	skippund										158.72 kg
52	3½	centner									49.60 kg
325	20	6¼	lispund								7.936 kg
5200	320	100	16	pund ^a							496.0 g
10,400	640	200	32	2	mark						248.0 g
83,200	5120	1600	256	16	8	unze					31.0 g
166,400	10,240	3200	512	32	16	2	lod				15.5 g
665,600	40,960	12,800	2048	128	64	8	4	quintin or kvintin			3.875 g
2,662,400	163,840	51,200	8192	512	256	32	16	4	ort		968.75 mg
42,598,400	2,621,440	819,200	131,072	8192	4096	512	256	64	16	es or as	60.55 mg

^aDefined as the weight of 1/62 cubic fod of water = about 496.0 g (based on [FRII] and [THES]). There is some uncertainty about the exact weight. [BRUU2, pp. 201–202] reported it as 498.087 6 g, and [PETE, p. 143] as 499.72 g

Metric-linked upper scale after 1839 (by the King's Order in Council, August 20, 1839)

							Metric
commercelæst or skiblast							2600 kg
$16\frac{1}{4}$	skippund or skibpund						160 kg
52	$3\frac{1}{5}$	centner or zentner					50 kg
$144\frac{4}{9}$	$8\frac{8}{9}$	$2\frac{2}{9}$	vog				18 kg
325	20	$6\frac{1}{4}$	$2\frac{1}{4}$	lispund			8 kg
$433\frac{1}{3}$	$26\frac{2}{3}$	$8\frac{1}{3}$	3	$1\frac{1}{3}$	bismerpund		6 kg
5200	320	100	36	16	12	pund	500 g

Metric-linked lower scale after 1839 (by the King's Order in Council, August 20, 1839)

							Metric
pund							500 g
16	unze						31.25 g
32	2	lod					15.625 g
128	8	4	kvintin				3.906 25 g
512	32	16	4	ort			976.562 5 mg
8192	512	256	64	16	es or as		61.035 156 mg
65,536	4096	2048	512	128	8	gran	7.629 394 mg

Metric-linked lower scale after July 1, 1861

							Metric
centner							50 kg
100	pund						500 g
200	2	mark^a					250 g
1000	10	5	unze				50 g
10,000	100	50	10	qvint or kvint^b			5 g
100,000	1000	500	100	10	ort		500 mg
1,000,000	10,000	5000	1000	100	10	es or as	50 mg

^aNot officially adopted, but sometimes used

^bUsually spelt qvint

For butter from c.1200 to c. 1526

			Metric
tønne			89.579 520 kg
6	løb		14.929 920 kg
14	$2\frac{1}{3}$	smørpund	6.398 537 kg

For butter from 1526 to 1683

		Metric
løb		15.925 248 kg
$2\frac{1}{3}$	smørpund	6.825 106 kg

For butter before 1683

							Metric
smørtønde							126.77 kg
4	kisner or fjerdings						31.69 kg
8	2	otting					15.85 kg
32	8	4	bøtte, kande, or kvarter				3.962 kg
64	16	8	2	stob, stor skaal, or tolvte			1.981 kg
128	32	16	4	2	bolle or liden skaal		990.4 g
256	64	32	8	4	2	slettepund	495.2 g
512	128	64	16	8	4	2	mark 247.6 g

For butter in Langeland before 1683

				Metric
tønde				126.80 kg
8	ask or skæppe			15.85 kg
16	2	lispund		7.925 kg
32	4	2	kande, korter, or stob	3.962 kg

For butter in Salling before 1683

			Metric
spand			10.563 kg
1½		letpund	7.042 kg

For butter in Salling before 1683

			Metric
tønde smør			126.58 kg
20	bismerpund		6.33 kg
480	24	bismermark	263.7 g

For butter in Fyn before 1683

			Metric
tønde smør			126.75 kg
18	bismerpund		7.04 kg
432	24	bismermark	293.4 g

For butter in Sjælland before 1683

			Metric
tønde smør			126.76 kg
16	bismerpund		7.92 kg
384	24	bismermark	330.1 g

For butter in Mors before 1683

			Metric
tønde smør			126.58 kg
15	bismerpund		8.44 kg
360	24	bismermark	351.6 g

For butter in Hardsyssel before 1683

			Metric
tønde smør			126.58 kg
10	bismerpund		12.66 kg
240	24	bismermark	527.4 g

For butter in Hardsyssel before 1683

			Metric
tønde smør			126.73 kg
9	bismerpund		14.08 kg
216	24	bismermark	586.7 g

For butter before 1839 and after 1839

						Metric	Metric
tøned smør						110.105 kg	112 kg
3	drittel					37.035 kg	37.333 kg
8	2½	otting or åtting				13.89 kg	14 kg
28	9½	3½	bøtte			3.97 kg	4 kg
112	37½	14	4	bolle or liden skål		992 g	1 kg
224	74½	28	8	2	pund	496 g	500 g

For apothecaries and medical use: using nürnberg pund; before December 13, 1857; and 1858–1869

					Metric	Metric	Metric
apotekerpund					375.84 g	357.853 8 g	375 g
12	unse				31.32 g	29.821 15 g	31.25 g
96	8	drachme			3.915 g	3.727 644 g	3.906 25 g
288	24	3	apotekerskrupel		1.305 g	1.242 548 g	1.302 08 g
5760	480	60	20	gran	65.2 mg	62.127 mg	65.1 mg

For precious metals around 1600

						Metric
Amsterdam pund						441.169 92 g
16	unse					27.573 12 g
32	2	lod				13.786 56 g
128	8	4	quintin			3.446 64 g
512	32	16	4	ort		861.66 mg
9216	576	288	72	18	es or as	47.87 mg

For precious metals around 1650

						Metric
Amsterdam pund						442.368 g
16	unse					27.648 g
32	2	lod				13.824 g
128	8	4	quintin			3.456 g
512	32	16	4	ort		864 mg
9216	576	288	72	18	es or as	48 mg

Probervægt for gold and silver around 1680, based on the Cologne standard before 1683

							Metric
pund							~460 g
2	mark						~230 g
16	8	unse					~28.75 g
32	16	2	lod				~14.375 g
128	64	8	4	quintlein			~3.594 g
512	256	32	16	4	ort		~898.4 mg
9216	4608	576	288	72	18	es or as	~49.9 mg

For gold around 1680, based on the Cologne standard before 1683

				Metric
mark				~230 g
24	karat			~9.583 g
96	4	gran		~2.396 g
288	12	3	gren	~798.6 mg

Probervægt for gold and silver, after 1683, based on the mark of Cologne after 1683

				Metric
kølnør pund				470.32 g
2	kølnør mark			235.16 g
16	8	unse		29.395 g
32	16	2	lod	14.697 g

Probervægt for gold and silver after 1698, based on the Cologne standard

							Metric
kølnør pund^a							466.823 53 g
2	kølnør mark						233.411 76 g
16	8	unse					29.176 47 g
32	16	2	lod				14.588 23 g
128	64	8	4	qvintin			3.647 06 g
512	256	32	16	4	ort		911.76 mg
9216	4608	576	288	72	18	es or as	50.65 mg

^aIn the ordinance of 1698, 1 pund in silver was set at 16/17 of 1 pund. It has also been reported as 468.787 5 g ([BRUU, p. 218]) and as 467.6 g ([PETE, p. 151])

For gold and silver during the early nineteenth century [DOUR]

						Metric
lødemark						235.389 419 52 g
8	unse					29.423 677 44 g
16	2	lod				14.711 838 72 g
64	8	4	kvintin			3.677 959 68 g
4096	512	256	64	es or as		57.468 12 mg

For gold and silver during the late nineteenth century [MART3]

						Metric
pund						470.588 200 g
2	mark					235.294 100 g
16	8	unse				29.411 762 g
32	16	2	lod			14.705 881 g
128	64	8	4	kvintin		3.676 470 g
8192	4096	512	256	64	ort	57.445 mg

Other reported measures:

- 1 **kultønde** (for charcoal) = about 130 kg;
- 1 **tønde ærter** (for peas and beans) = about 112.5 kg;
- 1 **tønde turnipa** (for turnips) = about 112.5 kg;
- 1 **tønde hvede** (for wheat) = about 106.5 kg;
- 1 **tønde kartofler** (for potatoes) = about 100.0 kg;
- 1 **tønde rug** (for rye) = about 98.5 kg;
- 1 **tønde 2-radet byg** (for barley) = about 92.0 kg;
- 1 **tønde runkelroer** (for sugar-beets) = about 90.0 kg;
- 1 **tønde kålroer** (for Swedish turnips) = about 90.0 kg;
- 1 **tønde boghvede** (for buckwheat) = about 85.0 kg;
- 1 **tønde gulerødder** (for carrots) = about 80.0 kg;
- 1 **tønde havre** (for oats) = about 70.0 kg;
- 1 **balle** (for spices and chemicals) = varying between 100 and 400 pund;
- 1 **last** (for dried fish, brass, lead, potash, iron and tartar) = 12 skippunds = 3840 pund;
- 1 **last** (for clay, sugar and lemon peel) = 3200 pund;
- 1 **last** (for feathers, flax, hemo, hops, linen yarn and wax) = 6 skippunds = 1920 pund;
- 1 **skive** (for soups) = 1/14 skippund = about 11.32 kg (before 1683) and about 11.43 kg (after 1683);
- 1 **spand** (for butter in Bornholm and in Dragsholm before 1683) = 7.923 kg;
- 1 **vegt smør** (for butter in Sallingsyssel before 1683) = 15 slettepund = 7.428 kg;
- 1 **vegt smør** (for butter in Fiendsherred before 1683) = 14 slettepund = 6.933 kg;
- 1 **skok** (for yarn after 1839) = 1/2 lispund = 4 kg;
- 1 **snes** = varying between 10 and 30 pund;
- 1 **strå** or **straa** (for smoked herring) = 1/20 læst.

9 Djibouti [Formerly: French Territory of the Afars and Issas, French Somaliland]

In 1856, the French government purchased the territory of Obock, and in 1896, the French Somaliland was established by conjoining the former French Protectorates of Obock, Tadjoura and Djibouti. Djibouti became the capital of French Somaliland in 1891, replacing Tadjoura. French Somaliland was a colony of France from 1896 until 1946, when it became a territory within the French Union. In 1967, the area became an overseas territory of France, known as the French Territory of Afars and Issas. It gained its independence as the Republique de Djibouti in 1977.

The traditional systems for weights and measures were mainly influenced by the Arabic system. The metric system has been official since 1898.

Main sources: [UN55] and [UN66]

9.1 Currency

1977–:	1 Djibouti franc = 100 centimes
1967–1977:	1 French Afars and Issas franc = 100 centimes
1948–1967:	1 Côte Française des Somalis (French Somaliland) franc = 100 centimes
c. 1885–1948:	1 French franc = 100 centimes 1 Indian rupee = 16 anna = 64 pice 1 Maria Therea Thaler

9.2 Units of Area

1 **feddan** = 0.42 ha.

10 Dobruja

See also *Bulgaria* and *Romania*.

This area had been part of the Roman Empire, the Byzantine Empire, and the Bulgarian Empire, and then under Mongol rule before it became autonomous in 1325. In late 1388, it came under Wallachian rule. The Ottomans occupied the area in 1420, and it remained under Ottoman control until the 1878 war, when Russia received Northern Dobruja and Bulgaria received the southern half of Dobruja. Russia forced Romania to turn over a region partly overlapping the so-called Southern Bessarabia to it. In 1913, after the Second Balkan War, Bulgaria lost Southern Dobruja to Romania.

Main source: [AKAD]

11.1 Currency

- 1973–: 1 US dollar = 100 cents
- 1965–: 1 East Caribbean dollar = 100 cents
- 1950–1964: 1 British East Caribbean dollar = 100 cents
- 1935–1950: 1 British West Indies dollar = 100 cents
- 1862–1935: 1 US dollar = 100 cents
- 1842–1862: 1 pound sterling = 20 shillings = 240 pence
- 1813–1841: 1 holed Spanish colonial dollar = 16 bits; 1 unholed Spanish colonial dollar = 18 bits

10.1 Units of Weight

						Metric
cechlos						225.798 kg
4	cántara					56.449 kg
176	44	oca				1.283 kg
400	100	2 ³ / ₁₁	lodre			564.49 g
70,400	17,600	400	176	dram		3.207 g
1,126,400	281,600	6400	2816	16	caratur	200.46 mg

11 Dominica (Commonwealth of Dominica)

This island was discovered by Christopher Columbus in 1493. The French colonized the island in 1632, but it was captured by the British in 1756. Thereafter, it changed hands between the French and British a dozen times. The Treaty of Versailles formally recognized Britain’s sovereignty over the Dominican Islands, Grenada, St. Vincent, St. Cristopher and Montserrat in 1783, but it did not become a permanent British possession until 1805. Dominica became part of the West Indies Federation from 1958 until 1962, and gained its independence in 1978.

Both the British Imperial system and the metric system is in use.

- 1791–1813: 1 holed Spanish colonial dollar = 11 bits; 1 unholed Spanish colonial dollar = 12½ bits

12 Dominican Republic [Formerly: Santo Domingo]

See also *Haiti*.

The entire island of Hispaniola, discovered by Christopher Columbus in 1492, was originally a Spanish colony, known by the name of Santo Domingo. The island was formally divided between French Saint Dominique (present-day Haiti, which became a French colony in 1677) and Spanish Santo Domingo (present-day Dominican Republic) in 1697. Santo Domingo was a Spanish colony from 1492 to 1795, a

French colony from 1795 to 1808, and once again a Spanish colony from 1808 to 1821. In 1821, the Dominican Republic gained its independence, but it was reconquered by Haitians in 1822. It became independent as the Dominican Republic in 1844, transforming into a province of Spain between 1861 and 1865, and then falling under American rule from 1916 to 1924.

The metric system has been official since 1849 and compulsory since Aug. 1, 1913. It was legally adopted again in 1942–55.

Main sources: [MART3], [UN55], and [UN66]

12.1 Currency

1937–:	1 Dominican peso or peso oro = 100 centavos
1905–1937:	1 US dollar = 100 cents
1891–1897:	1 Franco = 100 centimos
1877–1905:	1 Dominican peso or peso oro = 100 centavos
1844–1877:	1 Dominican peso or peso oro peso = 8 reales
1814–1821:	1 Haitian gourde or goud = 100 centimes or santimes
1800s–1814:	1 piastre gourde = 100 centimes
1700s–1800s:	1 piastre gourde = 4 gourdins = 8 escalins

12.2 Units of Length

Castilian-linked system

		Metric
legua		6687.240 000 m
8000	vara	835.905 mm

British Imperial-linked system

			Metric
yarda			914.392 mm
3	pie		304.797 mm
36	12	pulgada	25.400 mm

Other reported measures:

1 **ona** = 1.188 m.

12.3 Units of Area

				Metric
caballería				757,850.920 m ²
60	caró or carreau			12,630.849 m ²
3600	60	taréa		210.514 m ²
8,157,600	135,960	2266	pie cuadrado	92.901 dm ²

12.4 Units of Volume

Some reported measures:

1000 **piés cubicos** (for mahogany wood) = 34.277 270 m³;

1000 **piés cubicos inglés** (for mahogany wood) = 28.316 080 m³.

12.5 Units of Dry Capacity

			Metric
arroba			16.32 L
4	azumbre		4.08 L
16	4	cuartillo	1.02 L

Other reported measures:

1 **fanege** = 55.501 L.

12.6 Units of Liquid Capacity

			Metric
pipa			572.850 L
176%		galón	3.240 l L

12.7 Units of Weight

French-linked system

			Metric
legno			979.011 693 kg
20	quintal ^a		48.950 584 kg
2000	100	libra	489.506 g

^aOften used for cotton and tobacco

British Imperial-linked system

					Imperial	Metric
tonelada					2240 lbs	1016.047 542 kg
22%	quintal				100 lbs	45.359 265 kg
89%	4	arroba			25 lbs	11.339 816 kg
2240	100	25	libra		1 lb	453.592 g
35,840	1600	400	16	onza	1 oz	28.349 5 g

Metric-linked system

			Metric
quintal			1 kg
100	libra		500 g
1800	18	onza	27.778 g

Other reported measures:

1 **saco** (for coffee) = 75 kg.

13 Durrani Empire

See also *Afghanistan*.

This Empire was founded in 1747 by Ahmad Shah Durrani. The empire encompassed present-day Afghanistan, Pakistan, northeastern Iran, eastern Turkmenistan, northwestern India and the Kashmir region. After the First Anglo-Afghan War (1838–42), the Barakzai dynasty established the Emirate of Afghanistan.

Main sources: [ADAM5], [NALW], and [SABA]

13.1 Currency

1776–1842: 1 toman = 20 Kabul rupees
1747–1776: 1 toman = 20 Kandahar rupees

13.2 Units of Area

Some reported measures:

1 **qulba** = the portion of irrigated land that one man would be able to cultivate with one oxen and one plow. This area was considered to give double space for sowing two kharwars

of grain; one half of the qulba was cultivated each year, while the other half remained fallow.

13.3 Units of Dry Capacity

Estimated system for wheat

				Metric
pai				56.4 kg
4	topa			14.1 kg
8	2	seer		7.05 kg
112	28	14	chutak	503.3 g

13.4 Units of Weight

Some reported measures:

1 **kharwar** = a donkey load = about 100 man = about 110 kg;
1 **maund** or **man** = varied by location;
1 **rupee** = 9.32 g.

14 Dutch East Indies

See *Indonesia*.

15 Dutch Guiana

See *Surinam*.

16 Dutch West Indies

See *Netherlands Antilles*.

17 East Africa

See *British Somaliland, Kenya, Uganda, and Zanzibar*.

East Africa was an administrative grouping of five separate British territories between 1903 and 1922.

17.1 Currency

1907–1922:	1 East African rupee = 100 cents
1903–1922:	1 East African florin = 2 shilling = 100 cents
1903–1907:	1 East African rupee = 16 annas = 192 pies

18 East Caribbean States [Formerly: British Caribbean Territories]

See also *Anguilla, Antigua, Barbados, Dominica, Grenada, Guyana, Leeward Islands, Nevis, St. Kitts, St. Lucia, St. Vincent, Trinidad & Tobago, Virgin Islands, and Windward Islands*.

The British Caribbean Territories was a currency board in existence between 1950 and 1965, for the purpose of providing Anguilla, Antigua, Barbados, Dominica, Grenada, Guiana, Nevis, St. Kitts, St. Lucia, St. Vincent and Trinidad & Tobago with a common currency. In 1965, a grouping, called the East Caribbean Territories, including Barbados, and the Leeward and Windward Islands, came into being. In 1981, the group was renamed the East Caribbean States.

19 East Pakistan

See *Bangladesh*.

20 East Timor or Timor Leste [Formerly: Portuguese Timor]

The first European powers to arrive on Timor were the Portuguese in the 1520s, followed by the Dutch, who established themselves in Kupang in 1613. The eastern part of the island was established as a Portuguese colony in 1642, and was known as Portuguese Timor until Portugal's decolonization of the country in 1975. It was occupied by Dutch and Australian forces from 1941 until 1942, and by the Japanese from 1942 until 1945. The former Dutch colony on the western part of the island became part of Indonesia in 1950. In late 1975, East Timor declared its independence, but was invaded and occupied by Indonesia later that year. In 1999, Indonesia relinquished control of the territory, and East Timor became a sovereign state in 2002.

Various Dutch and Portuguese units of measurement were reported as being used in trading from the seventeenth century. The metric system has been compulsory since 1957.

Main source: [BUDI]

20.1 Currency

2000–:	1 US dollar = 100 cents
1975–1999:	1 Indonesian rupiah = 100 sen
1959–1975:	1 Portuguese escudo = 100 centavos
1945–1958:	1 Portuguese Timorese pataca = 100 avos
1944–1945:	1 Netherlands Indian roepiah = 100 sen
1942–1944:	1 Netherlands Indies gulden
1894–1942:	1 Portuguese Timorese pataca = 100 avos
–1894:	1 Portuguese milréis = 1000 réis

20.2 Units of Length

Metric scale after 1957

				Metric
kilómetro				1000 m
1000	metru			1 m
100,000	100	sentímetru		0.01 m
1,000,000	1000	10	milímetru	0.001 m

20.3 Units of Liquid Capacity

1 **litru** = 1 L.

20.4 Units of Dry Capacity

1 **lata** = a 20 L oil can that holds 12.8 kg of unmilled rice, 16.3 kg of milled rice, or 18 kg of beans.

20.5 Units of Weight

1 **pikul** = as much as a man can carry on a shoulder-pole = about 60 kg;

1 **kilogramama** = 1 kg;

1 **catty** = 1/100 pikul = about 0.6 kg;

1 **grama** = 1 g.

21 Ecuador [Formerly: South of Colombia]

See also *Colombia*.

This area became part of the Incan Empire in 1463. The Kingdom of Quito, established in 1525, was invaded by Spanish armies in 1532, and conquered by Spanish conquistadors, under

Francisco Pizarro, in 1541. In 1563, Quito became an administrative district of Spain and part of the Vice-Royalty of Lima, and later the Vice-Royalty of Nueva Granada. Ecuador was part of the Vice-Royalty of New Granada until 1819. The States of Guayaquil and Cuenca became independent in 1820, and in 1822, the rest of Ecuador gained its independence. Later in 1822, Ecuador was incorporated into Great Colombia, with present-day Colombia and Venezuela. Ecuador gained its independence in 1830 as the State of the South of Colombia, and was renamed the State of Ecuador later the same year.

The metric system has been official since 1856 and compulsory since 1866 and 1871. British Imperial and old Spanish units were reported as still being used to a certain degree during the early twentieth century. The SI has been compulsory since 1974.

Main sources: [ECON], [ECUA], [MART3], [UN55], and [UN66]

21.1 Currency

2001–: 1 US dollar = 100 cents

1884–2000: 1 Ecuadorian condor = 25 sucres
1 Ecuadorian sucre = 10 decimos = 100 centavos

1871–1884: 1 Ecuadorian peso = 8 reales

1835–1871: 1 Ecuadorian escudo = 2 pesos = 16 reales

1822–1835: 1 Grand Colombia escudo = 2 pesos = 16 reales = 200 centavos

–1822: 1 Spanish escudo = 2 pesos = 16 reales = 200 centavos

21.2 Units of Length

Traditional system and metric-linked system during the twentieth century

					Metric	Metric
legua					4975.59 m	5000 m
3½	milla				1393.17 m	1400 m
59 ¹¹ / ₂₁	16 ² / ₃	cuadra			83.59 m	84.0 m
5 952 ⁸ / ₂₁	1 666 ² / ₃	100	vara		835.90 mm	840 mm
23, 809 ¹¹ / ₂₁	6666 ² / ₃	400	4	cuarta, quarta, or palmo	208.975 mm	210 mm

British Imperial scale

			Metric
milla inglés			1609.344 m
2112	vara		838.20 mm
5280	2¼	pié or pièze	304.8 mm

Other measures reported during the nineteenth to twentieth centuries:

- 1 **carga** (for cacao in Guayaquil) = 80 Castilian libras = 36.807 440 kg;
1 **mula** or **fanega** (for potatoes) = 91 kg.

21.3 Units of Area

Traditional system

					Metric
caballeria					112,896 m ²
16	cuadra cuadrada				7056 m ²
64	4	solar			1764 m ²
256	16	4	cantero		441 m ²
160,000	10,000	2500	625	vara cuadrada	0.705 6 m ²

21.4 Units of Dry Capacity

1 fanega = 55.5 L.

21.5 Units of Liquid Capacity

				Metric
moyo				568.32 L
16	cantaro			35.52 L
128	8	azumbre		4.44 L
512	32	4	cuartillo	1.11 L

Other measures reported during the nineteenth to twentieth centuries:

- 1 **arroba menorah** = 12.56 L;
1 **balde** (for milk) = 10 L.

21.6 Units of Weight

Traditional system and metric-linked system

								Metric	Metric
fanega or mula								92.019 kg	92 kg
2	quintal or media							46.009 kg	46 kg
2½	1¼	tercio						36.807 kg	36.8 kg
4	2	1⅓	cuartilla					23.005 kg	23 kg
7½	3¾	2⅔	1⅞	almud				12.883 kg	12.88 kg
8	4	3⅓	2	1⅓	arroba			11.502 kg	11.5 kg
16	8	6⅓	4	2⅔	2	botija		5.751 kg	5.75 kg
200	100	80	50	28	25	12½	libra	460.093 g	460 g

22 Egypt [Formerly: United Arab Republic (with Syria)]

In 1517, the Mamluks were conquered by the Ottomans. Egypt was part of the Ottoman Empire, but ruled by the Mamluks, when it was invaded by France in 1798. The British expelled the French in 1801. In 1914, the Egypt Sultanate was made a British protectorate. The British ended said protectorate in 1922. Egypt gained its full independence in 1936, though the British continued their presence there until the Anglo-Egyptian treaty was repealed in 1952. Egypt was briefly united with Syria from 1958 to 1961 as part of the United Arab Republic.

The traditional systems for weights and measures were mainly influenced by the Arabic system. Later, the Mamluk, Ottoman and British systems came to influence the Egyptian standard

measurement systems. The metric system was established by law in 1939, and became compulsory during 1951-61.

Main sources: [BENC], [ECON], [FORE], [GRAN3], [HARM], [MART3], [UN55], and [UN66]

22.1 Currency

1982–: 1 Egyptian pound = 100 piastres
= 1000 milliemes
1953–1982: 1 Egyptian pound = 1000
milliemes
1885–1953: 1 Egyptian pound = 100 piastres
= 1000 milliemes
1834–1885: 1 piastre = 40 para
–1834: 1 Ottoman lira = 100 piastres =
4000 paras = 12,000 aspers

In Alexandria during the late eighteenth century

purse											
–	fundeclee										
–	–	zumabob									
–	–	4320/ 3852	zenzerli								
277 $\frac{2}{3}$	1156/540	1 $\frac{1}{3}$	1284/ 1080	mahoub							
625	289/60	3	321/120	2 $\frac{3}{4}$	piastre						
833 $\frac{1}{3}$	73/15	4	107/30	3	1 $\frac{1}{3}$	griscio or abuquelp					
2500	14 $\frac{2}{5}$	12	10 $\frac{7}{10}$	9	4	3	ducatallo				
25,000	146	120	107	90	40	30	10	medino or para			
75,000	438	360	321	270	120	90	30	3	asper		
150,000	876	720	642	540	240	180	60	6	2	forli	
200,000	1168	960	856	720	320	240	80	8	2 $\frac{2}{3}$	1 $\frac{1}{3}$	borbi

22.2 Units of Length

Traditional system

		Metric
malakah		~64 min of walking
16	dereghe	~4 min of walking

Medieval Arab system (estab. c. 700–900)

								Metric
farsakh								1740.6 m
3	mil hachmi							580.2 m
500	166⅔	kaṣabah						3.481 2 m
750	250	1½	gasab or qasab ^a					2.320 8 m
3000	1000	6	4	dirá baladi or pic ^b				580.2 mm
6000	2000	12	8	2	kadam			290.1 mm
18,000	6000	36	24	6	3	abdat		96.7 mm
72,000	24,000	144	96	24	12	4	qirat	24.17 mm

^aIt was also reported as 3.55 m^bUsed for textiles

Medieval Arab system (estab. c. 700–900)

							Metric
bâa							3.0 m
4	diraa mémari, dhira ma'mari, or dirâ macmari ^a						750 mm
24	6	qabd'ah					125 mm
96	24	4	uḥbú or usbaa				31.248 mm
576	96	24	6	habba shair ^b			5.208 mm
3456	576	96	36	6	qirat barsoun		0.868 mm

^aFor building^bAlso reported as 5.22 mm

Some measures reported during the eighteenth century:

- 1 **malakāh** = the distance between two villages;
- 1 **schaenus** (in Upper Egypt) = about an hour and a half's journey = about 3¾ and 4½ miles;
- 1 **schaenus** (in Lower Egypt) = about an hour's journey = about 2½ and 3 miles;
- 1 **bâa** = the distance from one hand to the other, with both arms extended;

1 **diráa Istamboolee** (cubit of Constantinople; for European cloth) = about 26½ inches = 673.1 mm;

1 **diráa hindázeh** (for Indian goods) = about 25 inches = 635 mm;

1 **diráa beledee** (for linen manufactured in Egypt) = about 22⅔ inches = 575.7 mm;

1 **shibr** = the distance between the tip of the thumb and the tip of the outstretched little finger;

1 **fitr** = the distance between the extension of the thumb and the first finger.

Metric-linked upper scale reported during the late nineteenth century

				Metric
farsakh				2250 m
3	mil hachmi			750 m
750	250	bâa		3 m
3000	1000	4	diraa mémari, dhira ma'mari, or dirâ macmari	750 mm

Metric-linked lower scale reported during the late nineteenth century

					Metric
diraa mémari, dhira ma'mari, or dirâ macmari					750 mm
6	qabd'ah				125 mm
24	4	aşba^c, uçbú, or usbaa			31.25 mm
144	24	6	habba shair		5.208 mm
864	144	36	6	qirat barsoun or qirat barsum	868.05 mm

Other measures reported during the nineteenth century:

- 1 **pik mébandeze** (for land) = 24 kirāt = 771.5 mm;
- 1 **kirāt** (for sculptures in stone) = 770.0 mm;
- 1 **pik mehendaseh** (factory scale in Cairo) = 4 rub = 24 kirāt = 767.0 mm;
- 1 **pik** (used in building) = 750 mm;
- 1 **pik stambuli** (for European silk) = 4 rub = 24 kirāt = 677.0 mm or 691.4 mm;
- 1 **pik stambúli** or **dhira stambúli** = 660 mm;
- 1 **pik endaseh** (for cotton and linen) = 638.4 mm;
- 1 **Scutari pik** (at present-day Üsküdar) = 631.36 mm;
- 1 **pik hendesi** or **dhira handasa** (for Indian muslins and cotton stuff) = 4 rub = 24 kirāt = 630.5 or 650 mm;
- 1 **pik baladi** or **dhira baladi** (of the country) = 580 or 585 mm;
- 1 **pik beledi** or **pik massri** (for cloth and cotton from the Orient) = 4 rub = 24 kirāt = 568.47 mm or 577.50 mm;

- 1 **pik mechias** (Mekka standard) = 4 rub = 24 kirāt = 540.7 mm;
- 1 **nili** = 524.5 mm;
- 1 **qadam** = 1 English foot = 304.8 mm;
- 1 **shibr** = 225 mm;
- 1 **fiṭr** 6= buça = 6 inches = 152.4 mm;
- 1 **kasaba** or **kasba** = 1/6 carpenter's arşın = 125 mm;
- 1 **buça** = 1 English inch = 25.4 mm.

Turkish standard for silk and wool

					Metric
kaşabah or qaçaba					3.554 25 m
5¼	pik stambuli				677.0 mm
21	4	rup			169.25 mm
126	24	6	qirat		28.21 mm

For cloth, linen, and Syrian silk in Alexandria

					Metric
kaşabah					3.850 m
6⅔	pik beledi				577.5 mm
136⅔	20½		qirat		281.7 mm

In Cairo

						Metric
malacah or maraga						4928 m
16	dereghe					308 m
64	4	faddān or feddan				77 m
1280	80	20	cassabeh			3.85 m
6400	400	100	5	chirat		770 mm
28,160	1760	440	22	4⅔	tsciobdah	175 mm

22.3 Units of Area

Ancient scale during the Roman period

								Metric
kha-ta or jata								197,473 m ²
10	khat or jat							19,747.3 m ²
100	10	setjat , aroura , or arura						1974.73 m ²
~200	~20	~2	remen					987.36 m ²
~400	~40	~4	2	heseb or hebes				493.68 m ²
~800	~80	~8	4	2	sa			246.84 m ²
~1000	~100	~10	~5	~2½	~1¼	kha		197.47 m ²
~10,000	~1000	~100	~50	~25	~12½	10	ta or mej	19.75 m ²

Scale used during the eighteenth century

								Metric
qada								22,054.41 m ²
5¼	feddān or feddān maari							4200.84 m ²
126	24	ķeerāt , qīraṭ or kīrat kamel						175.035 m ²
378	72	3	habba					58.345 m ²
756	144	6	2	daneq				29.173 m ²
3024	576	24	8	4	sahme , sahm , or sehm			7.293 m ²
72,576	13,824	576	192	96	24	sahtout		0.303 88 m ²

1 **feddān**, according to [ROTT, p. 141], = 4200.833 3 m². [WAGN2] reported it as 4459.1 m².

1 **pik**² (used in building) = 5.62 m²;

1 **diraa mémari**² = 56.25 dm².

In Cairo

				Metric
feddān				5929.0 m ²
24	qīraṭ			247.041 7 m ²
400	16⅔	cassabeh ²		14.822 5 m ²
17, 777⅔	740 ^{20/27}	44⅔	pik beledi ²	333.506 3 m ²

For taxation in Cairo

				Metric
feddān				4459.102 1 m ²
24	qīraṭ			185.795 9 m ²
333⅓	13⅔	cassabeh ²		13.377 3 m ²

22.4 Units of Volume

In general, timber was sold by weight.

For timber and firewood in Cairo

			Metric
scechi			135.889 6 kg
110	oca		1.235 36 kg
305%	2%	rottet	444.729 6 g

Some reported measures for building:

1 **ķaşabah**³ = 10.547 m³;

1 **pik**³ = 421.875 dm³.

22.5 Units of Dry Capacity

Old scale

						Metric
ardeb, ardebb or irdabb						197.774 770 L
3	kanṭār					65.924 923 L
6	2	kuebeh, weybeh, or waiba				32.962 462 L
12	4	2	keila, kilah, or kēla			16.481 231 L
24	8	4	2	rub^c, roub, or roubouh		8.240 615 L
288	96	48	24	12	kele	686.718 mL

Traditional upper scale, as reported in 1876

								Metric
daribah or dariba								1467.80 L
8	ardeb							183.475 L
48	6	ouebeh or wa'ba						30.579 L
96	12	2	keila, or kilé					15.290 L
192	24	4	2	rub^c, roub, or roubouh				7.645 L
384	48	8	4	2	malouah			3.822 L
768	96	16	8	4	2	keddah		1.911 2 L
1536	192	32	16	8	4	2	nisf keddah	955.6 mL

Traditional lower scale, as reported in 1876

						Metric
nisf keddah						955.6 mL
2	roubb-keddah, rub^ca, or rub'					477.8 mL
4	2	thoumn-keddah or thumna				238.9 mL
8	4	2	kharouba, kharrûba or fjarûbba			119.4 mL
16	8	4	2		qyrât or kirat	59.7 mL

Upper new rounded scale, as reported in 1952

						Metric
daribah						1584 L
8	ardeb, ardabb, or irdabb^a					198 L
96	12	keila, kilah, or kilá				16.5 L
192	24	2	rob, roubouh, or rub			8.25 L
384	48	4	2	malouah		4.125 L
768	96	8	4	2	keddah, cadaa, kaledje, or kadah	2.062 5 L

^aThis was used for grain. Its size varied between 90 and 198 L. According to [TECH, p. 307], it was usually equal to 195 L

Lower new rounded scale, as reported in 1952

						Metric
keddah, cadaa, kaledje, or kadah						2.062 5 L
2	nisf keddah					1.031 25 L
4	2	robhah or roubb-keddah				515.625 mL
8	4	2	toumna or thounn-keddah			257.812 mL
16	8	4	2	khanoubah		128.906 mL
32	16	8	4	2	kirat	64.453 mL

Traditional system at Rosetta

			Metric
ardeb, ardabb, or irdabb			284.000 000 L
12	rob, roubouh, or rub		23.666 667 L
48	4	keddah, cadaa, kaledje, or kadah	5.916 667 L

In Alexandria and Cairo, based on [MART3]

					Metric	Metric
daribba					542 L	358 L
2	ardeb				271 L	179 L
12	6	vebih			45.166 667 L	29.833 333 L
24	12	2	cheleh or chela		22.583 333 L	14.916 667 L
48	24	4	2	rub or rubba	11.291 667 L	7.458 333 L

For corn in Alexandria

		Imp bu	Metric
kisloz		4 $\frac{7}{8}$	~ 177.30 L
1 $\frac{1}{2}$	rebebe	4 $\frac{1}{2}$	~ 163.66 L

Other reported measures:

- 1 **ardeb** (for grain and wheat) = 197.75 L;
- 1 **ardeb** (in Alexandria during the nineteenth century) = 179–182 L;
- 1 **ardeb** (for rice from Rosetta) = 181.61 L;
- 1 **ardeb** (for legumes) = 151.46 L;
- 1 **dscha** = 330 mL.

22.6 Units of Liquid Capacity

Traditional system (measured by weight)

								Metric
letech								143.44 kg
$2\frac{13}{16}$	artabe							51 kg
$3\frac{3}{8}$	$1\frac{1}{5}$	metretes (of Heron)						42.5 kg
$4\frac{7}{32}$	$1\frac{1}{2}$	$1\frac{1}{4}$	keramion or khar					34 kg
$16\frac{7}{8}$	6	5	4	apt				8.5 kg
$67\frac{1}{2}$	24	20	16	4	hecte			2.125 kg
$168\frac{3}{4}$	60	50	40	10	$2\frac{1}{2}$	maân or mine		850 g
675	240	200	160	40	10	4	outen	212.5 g

For rice (see also [BENC])

				Metric
daribah				1584 L
$13\frac{3}{7}$	zambil kabir or large fard			115.5 L
$27\frac{3}{7}$	2	zambil çaghir or small fard		57.75 L
192	14	7	rob or roubough	8.25 L

22.7 Units of Weight

Upper scale [medieval Arab system (estab. c. 700–900)]

				Metric
heml				249.6 kg
5%	қаңғар, cantar, qintar, quintal, or qantâr			44.928 kg
200	36	oke or oca		1248 kg
555%	100	$2\frac{2}{9}$	rotolo, raṭl, rotl, or rottle	449.28 g

Lower scale [medieval Arab system (estab. c. 700–900)]

								Metric
rotolo, raṭl, rotl, or rottle								449.28 g
32	uḳḳah or uckieh							14.04 g
96	3	mitḳál or miskal						4.68 g
128	4	$1\frac{1}{3}$	magar					3.51 g
144	$4\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{8}$	dirhem				3.12 g
2304	72	24	18	16	kirat or quirat			195 mg
10,368	324	108	81	72	$4\frac{1}{2}$	barley grain		43.3 mg

During the fourteenth century:

A unit called a **ḥabba** (for pearls) was mentioned in the *Mukātebāt-i Rasīdī* and the *Resālā-ye Falākiyyā*, according to [INAL2, p. 317].

Mamluk system during the fifteenth century

				Metric
ḳaṭār forforo				44.544 96 kg
36	uḳḳah			1.237 36 kg
100	2%	raṭl		445.449 6 g
14,400	400	144	drachmen	3.093 4 g

Mercantile scale reported during the early nineteenth century and late nineteenth century, based on [BUDG]

						Metric	Metric
ardeb^a						133.419 kg	134.79 kg
3	ḳaṭār^b					44.473–123.536 kg	44.93 kg
108	36–100	uḳḳah, oca, or wuḳḳah				1.235 36 kg	1.248 kg
300	100	2%	raṭl^c or rotolo			444.730 g	449.30 g
3600	1200	33⅓	12	uḳēeyeh or wuḳēeyeh		37.061 g	37.44 g
28,800	9600	266⅔	96	8	mitḳāl	4.632 6 g	4.68 g

^aFor various commodities, see below

^bIn Alexandria, usually said to equal 44 oken = 54.355 84 kg. According to [KELL], the **ḳaṭār zaydino** = 60.472 kg, the **ḳaṭār zauro** = 93.883 kg, and the **ḳaṭār mina** = 74.741 kg

^cThere was also a large **raṭl** = 26 uḳēeyeh = 963.581 g and a official **raṭl** = 15 uḳēeyeh = 555.912 g. In Alexandria, there was also a large **raṭl** = 963.43 g, and an old **raṭl** = 8¼ uḳēeyeh = 324.282 g. In Cairo, there was a large **raṭl** = 1.00 kg

In Alexandria, based on [KELL]

				Metric
oca				1.209 kg
400	dram			3.022 5 g
6400	16	carat		188.9 mg
25,600	64	4	grain	47.2 mg

For refined sugar in Alexandria, based on [MART3]

				Metric
uḳḳah, oca, or wuḳḳah				1.272 421 kg
1 ^{100/312}	rotolo			963.581 g
412	312	dram		3.088 g

In Cairo

									Metric
himi^a									741.216 000 kg
–	himi^b								617.680 000 kg
–	–	ardeb^c							395.315 200 kg
–	–	–	ardeb^d						389.138 400 kg
–	–	–	–	himi^e					370.608 000 kg
–	–	–	–	–	ardeb^f				333.547 200 kg
–	–	–	–	–	–	sack or bag^g			277.338 320 kg
216	180	115 $\frac{1}{5}$	113 $\frac{3}{5}$	108	97 $\frac{1}{5}$	80 $\frac{4}{50}$	oca		1.235 360 kg
600	500	320	315	300	270	224 $\frac{1}{2}$	2 $\frac{1}{2}$	rottet	444.729 6 g

^aFor linen^bFor peppers^cFor beans^dFor wheat and maize^eFor flour^fFor cotton seed^gFor milled rice

In Cairo, based on [MART3]

										Metric
cantar^a										123.536 000 kg
–	ardeb^b									113.035 440 kg
–	–	cantar^c								111.182 400 kg
–	–	–	cantar^d							103.770 240 kg
–	–	–	–	cantar^e						96.358 080 kg
–	–	–	–	–	cantar					88.945 920 kg
–	–	–	–	–	–	cantar^f				66.709 440 kg
–	–	–	–	–	–	–	cantar^g			62.262 144 kg
–	–	–	–	–	–	–	–	cantar^h		59.297 280 kg
100	91 $\frac{1}{2}$	90	84	78	72	54	50 $\frac{1}{5}$	48	oca	1.235 360 kg
277 $\frac{1}{9}$	254 $\frac{1}{6}$	250	233 $\frac{1}{5}$	216 $\frac{2}{5}$	200	150	140	133 $\frac{1}{5}$	2 $\frac{1}{2}$	rottet 444.729 6 g

^aFor wheat^bFor barley. Also reported as **ardeb**^cFor dried dates^dFor iron^eFor wool^fFor arsenic, plumbago, lime and linseed^gFor lead^hFor aloë

In Cairo, based on [MART3]

										Metric	
cantar ^a										58.704 306 kg	
–	cantar (small)									57.814 848 kg	
–	–	cantar ^b								55.814 848 kg	
–	–	–	cantar ^c							53.944 046 kg	
–	–	–	–	cantar ^d						53.367 552 kg	
–	–	–	–	–	cantar ^e					51.143 904 kg	
–	–	–	–	–	–	cantar ^f				48.920 256 kg	
–	–	–	–	–	–	–	cantar ^g			46.696 608 kg	
–	–	–	–	–	–	–	–	cantar ^h		45.708 320 kg	
47 ¹³ / ₂₅	46 ³ / ₅	45	43 ³ / ₅	43 ³ / ₅	41 ³ / ₅	39 ³ / ₅	37 ³ / ₅	37	oca	1.235 360 kg	
132	130	125	121 ⁸ / ₂₇	120	115	109 ³ / ₅	105	102 ³ / ₅	2 ³ / ₅	rottet	444.729 6 g

^aFor rubber^bFor drugs in general^cFor steel^dFor solid wood^eFor almonds and fruit^fFor carnations, nutmeg, sarsaparilla and ivory^gFor coffee. Coffee from Cairo was also sold by the **quintal** = 47.017 kg^hFor caffè mocha and peppers

In Cairo, based on [MART3]

							Metric
cantar^a							45.362 419 kg
–	cantar^b						45.090 640 kg
–	–	cantar^c					44.472 960 kg
36 ¹⁸ / ₂₅	36 ¹ / ₂	36	oca				1.235 360 kg
102	101 ⁷ / ₁₈	100	2 ³ / ₅	rottet			444.729 6 g
–	–	1200	33 ³ / ₅	12	uchieh		3.727 5 g
–	–	14,400	400	144	12	dirhem	30.884 mg

^aFor mercury, vermilion, zinc, and sugar^bFor the pond^cFor general use of various commodities

For barley in Cairo, based on [MART3]

			Metric
ardeb			113.035 44 kg
91 ¹ / ₂	oca		1.235 36 kg
254 ³ / ₅	2 ³ / ₅	rotolo	444.729 6 g

During the mid-nineteenth century, based on [WINS]

						Metric
cantar forfora or kañár forfora						43.092 kg
34 ³ / ₅	oca					1.257 kg
36	1 ¹ / ₂₀	harsela				1.197 kg
100	2 ¹ / ₁₂	2 ³ / ₅	rañl or rotolo forfora			430.92 g
10,000	291 ³ / ₅	277 ³ / ₅	100	miscalì		43.09 g
144,000	4200	4000	144	14 ³ / ₅	drachme	299 mg

Government scale during the late nineteenth to early twentieth centuries

					Metric
cantar or kaṇṭār					44.472 960 kg
36	oca				1.235 360 kg
100	2%	raṭl or rotolo			444.729 6 g
9600	266⅔	96	mitḳál		4.632 6 g
14,400	400	144	1½	dirhem	3.088 4 g

Scale reported during the late nineteenth century

							Metric
kikkar or talent							40.95 kg
50	mine						819 g
300	6	kedet					136.5 g
3000	60	10	deben				13.65 g
30,000	600	100	10	sep			1.365 g
45,000	900	150	15	1½	grain		910 mg
60,000	1200	200	20	2	1⅓	gerah or obol	682.5 mg

For various commodities during the nineteenth to twentieth centuries:

1 **bale** (for cotton) = 500 lbs = 226.8 kg;

1 **harsela** (for silk) = 1.195 kg;

1 **raṭl zauro** or **rotolo zauro** (for iron) = 1.005 kg;

1 **raṭl mina** or **rotolo mina** (for spices) = 636.4 g;

1 **raṭl zaidino** or **rotolo zaydino** (for dye-woods) = 516.2 g.

Scale reported in Suez during the nineteenth century

			Metric
oca			1.574 96 kg
2%	raṭl or rotolo		566.985 6 g
400	144	dirhem	3.937 4 g

Metric-linked system for silk and amber

		Metric
bai'a		4.5 kg
10	raṭl	450 g

For silk, rose oil, gold dust, medical use, pearls, gold and silver during the early nineteenth century

						Metric
mitḳál						4.632 6 g
1½	dirhem					3.088 4 g
24	16	keerát				193.025 mg
72	48	3	ḥabbeh or habba ^a		grain of barley	64.342 mg
96	64	4	1⅓	kamḥah or kommhah	grain of wheat	48.256 mg

^aDuring the mid-nineteenth century, also reported as about 65 mg

23 El Salvador

El Salvador was conquered by the Spanish conquistador Pedro de Alvarado in 1525. It was part of the Captaincy-General of Guatemala within the Vice-Royalty of New Spain until gaining its independence in 1821. In 1823, the United Provinces of Central America was formed by the five Central American states. This federation was dissolved in 1838. El Salvador formally became independent in 1842.

The metric system has been official since 1886 and compulsory since 1910 and 1912.

Main sources: [CAMP], [ECON], [MART3], [UN55], and [UN66]

23.1 Currency

2001–:	1 US dollar = 100 cents
1919–2003:	1 Salvadoran colón = 100 centavos
c.1870–1919:	1 Salvadoran peso = 100 centavos
1841–c.1870:	1 Salvadoran escudo = 8 reales
1824–1841:	1 Central American escudo = 2 pesos = 16 reales
–1824:	1 Spanish escudo = 2 pesos = 16 reales

23.2 Units of Quantity

1 **sēmpuwal** (among the pipils) = 5 (a group of things).

23.3 Units of Length

Traditional system

						Metric
legua						4179 m
2500	brazada					1671.6 m
5000	2	vara				835.8 mm
15,000	6	3	almud, tercia, or pié			278.6 mm
20,000	8	4	1⅓	cuarta		208.95 mm
180,000	72	36	12	9	pulgada	23.22 mm

British Imperial-linked system

					Imperial	Metric
brazada					5½ ft	1.676 4 m
1%	yarda				1 yd	0.914 4 m
2	1⅓	vara			2¾ ft	83.82 cm
5½	3	2¾	pié, pièze, or tercia		1 ft	30.48 cm
66	36	33	12	pulgada	1 in	2.54 cm

23.4 Units of Area

					Metric
caballería					44.964.8 ha
64	manzana				70.257 9 a
625	$9\frac{49}{64}$	cuerda or kwerda (32 vara \times 32 vara)			719.440 9 m ²
6400	100	$10\frac{6}{25}$	cuadra		70.257 9 m ²
640,000	10,000	1024	100	vara cuadrada	70.257 9 dm ²

Other reported measures:

- 1 **tarea** or **nāwi ixku** (among the pipils) = a day's work; reported as 280, 398, 438 or 875 m²;
- 1 **ixku** (among the pipils) = a quarter of a day's work.

23.5 Units Volume

Metric-linked system

		Metric
camionada^a		3 m ³ or 2722 kg
3	carretada	1 m ³ or 907.184 kg

^aSometimes referred to as a truckload

Other reported measures:

- 1 **kūpān-ti** or **pān-ti** (for piled and chopped firewood among the pipils) = 2 varas \times 1 vara \times $\frac{1}{2}$ vara = 583.86 dm³;
- 1 **vara** (for mahogany) = 1 vara \times $\frac{1}{9}$ vara \times $\frac{1}{2}$ vara = 32.45 dm³.

23.6 Units of Dry Capacity

For corn among the pipils

					Metric
large bushel					~14.4 L
2	small bushel				~7.2 L
12	6	sonte or tsunti			~1.2 L
240	120	20	handful		~60 mL
1200	600	100	5	ēlut^a	~12 mL

^aAn ear of corn

23.7 Units of Liquid Capacity

Traditional system

			Metric
arroba mayor or cántara			16.128 L
8	azumbre		2.016 L
32	4	cuartillo	504 mL

Metric linked system

			Metric
galón			3.75 L
$3\frac{3}{4}$	litro		1 L
5	$1\frac{1}{3}$	botella	0.75 L

23.8 Units of Weight

Traditional upper scale and British Imperial-linked system

							Metric	Metric
camionada							2756.118 kg	2721.552 kg
3	carretada						918.706 kg	907.184 kg
13%	4 ¹⁷ / ₂₇	fanega ^a					198.440 kg	195.952 kg
30	10	2 ¹ / ₂₅	carga ^b				91.871 kg	90.718 kg
60	20	4 ¹ / ₂₅	2	quintal or nāwi			45.935 kg	45.359 kg
166 ² / ₃	55 ¹ / ₉	12	5 ¹ / ₉	2 ¹ / ₉	almud		16.537 kg	16.33 kg
240	80	17 ¹ / ₂₅	8	4	1 ¹ / ₂₅	arroba or almun	11.484 kg	11.34 kg

^aOther scales used were: 480 libras = about 221 kg, 600 libras = about 276 kg, and 720 libras = about 331 kg

^bAlso reported as 300 lb = 136.08 kg

Traditional lower scale and British Imperial-linked system

				Metric	Metric
arroba or almun				11.484 kg	11.34 kg
1 ⁷ / ₁₈	medio almud			8.268 kg	8.165 kg
12 ¹ / ₂	9	mancuerna		918.706 g	907.184 g
25	18	2	libra	459.353 g	453.59 g

Metric-linked system for corn, beans, rice, yuza and yams during the early twentieth century

						Metric
tonelada corta						920 kg
10	carga					92 kg
20	2	quintal or nāwi				46 kg
80	8	4	arroba or almun			11.5 kg
2000	200	100	25	libra		460 g
32,000	3200	1600	400	16	onze	28.75 g

Other reported measures:

1 **saco** (for coffee) = 69 kg;

1 **gramo** = 1 g.

24.1 Currency

1944–: 1 Leo d’or

24 Elleore

Elleore is an unrecognised micronation, founded in 1944, that is actually part of Zealand in Denmark.

25 Ellice Islands

See *Tuvalu*.

26 Elobey, Annobón, and Corisco

See *Equatorial Guinea*.

The small islands of Annobón, Corisco, Elobey Grande and Elobey Chico were a colonial administration of Spanish Africa until 1909.

27 Epirus

See *Albania*.

28 Equatorial Guinea [Formerly: Gulf of Guinea, Spanish Guinea]

See also *Elobey*, *Annobón*, and *Corisco*.
The islands of Annobón and Fernando Pó (present-day Bioko), inhabited by a Bubi ethnic group, were first visited by the Portuguese navigator Fernão do Pó in 1473, or possibly 1474. The Dutch East India Company established trade bases on Fernando Pó in 1642. In 1778, the islands, along with the mainland area called Río Muni, were ceded to Spain under the Treaty of El Pardo. The British established a base on Fernando Pó, from 1827 to 1843, to combat the slave trade. In 1844, on restoration of Spanish sovereignty, the area was renamed Gulf of Guinea. The mainland portion, Río Muni, became a protectorate in 1885 and a colony in 1900. After the Spanish-American War of 1898, the area became a Spanish colony. Fernando Pó, Annobón and Río Muni were united as Spanish

Guinea in 1926. The whole territory was first represented in the Spanish Cortes in 1960, when the Africans were given equal status. In 1963, after a plebiscite, the colony granted given self-government and renamed Equatorial Guinea. A further plebiscite led to complete independence in late 1968.
The Spanish system for weights and measures was in use well into the twentieth century. Now, the metric system is officially in use.

28.1 Currency

- 1985–: 1 CFA franc = 100 centimes
- 1979–1985: 1 Equatorial Guinean epkwele = 100 céntimos
- 1973–1979: 1 Equatorial Guinean ekuele = 100 céntimos
- 1969–1973: 1 Equatorial Guinean peseta = 100 céntimos
- 1864–1968: 1 Spanish peseta = 100 céntimos
- 1827–1844: 1 pound Sterling = 20 shillings = 240 pence
- Eighteenth century: the Bubi people made strings of snailshells and plated them together to make circular bands or belts called jibbu

28.2 Units of Length

Castilian-linked system

								Metric
legua or lieue								6687.240 m
2000	estadal or perche							3.344 m
4000	2	braza or toise						1.672 m
4800	2⅔	1½	paso or pas					1.393 m
8000	4	2	1⅔	vara or verge				835.905 mm
16,000	8	4	3⅔	2	codo or coudée			417.953 mm
24,000	12	6	5	3	1½	pie or pied		278.635 mm
288,000	144	72	60	36	18	12	pulgada or pouce	25.400 mm

28.3 Units of Area

Castilian-linked system

					Metric
yugada or jugère					321,978.087 m ²
50	fanegada or matutine				6439.562 m ²
600	12	celemín or travée			536.630 m ²
2400	48	4	cuartillo or quart de travée		134.157 m ²
460,800	9216	768	192	vara cuadrada or verge carrée	69.873 dm ²

28.4 Units of Dry Capacity

Castilian-linked system

					Metric
cahíz or muid					666.000 000 L
12	fanega or boisseau				55.500 000 L
144	12	celemín or gallon			4.625 000 L
288	24	2	medio		2.312 500 L
576	48	4	2	cuartillo	1.156 250 L

28.5 Units of Liquid Capacity

Castilian-linked system

					Metric
arroba					16.133 333 L
8	azumbre or quade				2.016 667 L
21 ¹ / ₃	2 ² / ₃	botella			756.250 mL
32	4	1 ¹ / ₂	cuartillo or pinte		504.166 mL

28.6 Units of Weight

Castilian-linked system

						Metric
tonelada or tonne						920.160 kg
20	quintal					46.008 kg
80	4	arroba				11.502 kg
2000	100	25	libra or livra			460.080 g
4000	200	50	2	marco or marc		230.040 g
32,000	1600	400	16	8	onza or once	28.755 g

29 Eritrea [Formerly: Eritrea Autonomous Region in Ethiopia]

See also *Ethiopia*.

Eritrea was part of the Ottoman Empire from 1557 to 1865, and under Egyptian rule from 1865. Italy began settling Massawa in 1885 and soon purchased the port of Aseb. Eritrea was created in 1890, when it became an Italian colony. In 1936, Eritrea became a province of Italian East Africa. It fell under British military administration between 1943 and 1950 and under a UN mandate between 1950 and 1951. Eritrea became part of a federated Ethiopia in 1952. The federation was dissolved in 1962, and Eritrea became a province of Ethiopia. 1993 saw a guerilla war that ended with Eritrea declaring its independence.

The metric system has been official since 1927.

Main sources: [CARD], [CLAS], [CRUM], [GUIL], [UN55], [UN66], and [ZIMM]

29.1 Currency

- 1997–: 1 Eritrean nakfa = 100 cents
- 1976–1997: 1 Ethiopian birr = 100 santims or senteems
- 1945–1976: 1 Ethiopian dollar = 100 cents
- 1941–1945: 1 East African shilling = 100 cents
- 1936–1941: 1 East African lira = 100 centesimi
- 1921–1931: 1 Abyssinian birr = 100 santims
- 1890–1921: 1 Eritrean tallero = 5 lire = 500 centesimi

29.2 Units of Length

Traditional system

		Metric
khalad		~65 m
130	kend^a or kind	~500 mm

^aTraditionally, the distance from the elbow to the tip of the middle finger. [CRUM, p. 178] reported it to vary between 480 and 500 mm

Traditional system and metric-linked system

				Metric	Metric
emmet, derah, or deraga				467.36 mm	460 mm
$1\frac{7}{16}$	cubi			325.12 mm	320 mm
2	$1\frac{9}{23}$	sinjer, sedri, sener, senzer, or sinzer		233.68 mm	230 mm
$6\frac{7}{15}$	$4\frac{4}{15}$	$3\frac{7}{15}$	gat	76.2 mm	75 mm

British Imperial-linked system (names in Tigrinya)

				Metric
ማይል or ሳቕን ንውሓት				1609.344 m
1760	ጫተር or መዓቀኒ ንውሓት			914.4 mm
5280	3	እግሪ		304.8 mm
63,360	36	12	ኢንች	25.4 mm

Other reported measures:

- 1 farsakh, farsak, farsakh-song, farasang, farsang, or parasakh = 5070 m;
- 1 Turkish pik = 680 mm.

Metric system (names in Tigrinya)

				Metric
ኪሎሜትር				1000 m
1000	ሜትር, ሜትር, or መትሮ			1 m
100,000	100	ሰንቲ ሜትረ		10 mm
1,000,000	1000	10	ሚሊ ሜትር	1 mm

29.3 Units of Area

1 **gasha** (for agricultural land) = usually about 40 ha.

29.4 Units of Dry Capacity

Traditional system

		Metric
ardeb		4.40 L
10	madega	440 mL

Metric-linked system

			ሊተር or ሊትሮ		Metric
tat					25 L
5	kunna or kouna				5 L
8⅓	1⅔	goundo			3 L
25	5	3	kuba		1 L
83⅓	16⅔	10	3⅓	wancha ^a	300 mL

^aOld name for a drinking-horn. See [PARK4, p. 362]

29.5 Units of Liquid Capacity

Traditional system

							Metric
entelam							189.056 L
$1\frac{1}{2}$	saccoa						106.344 L
8	$4\frac{1}{2}$	ghebeta					23.632 L
$10\frac{2}{3}$	6	$1\frac{1}{3}$	tanica^a				17.724 L
32	18	4	3	cabaho			5.908 L
96	54	12	9	3	caba		1.969 L
128	72	16	12	4	$1\frac{1}{3}$	encá, encáa, or messé	1.477 L

^aThe tanica varied greatly depending on the province and the commodity

British Imperial-linked system (names in Tigrinya)

			Metric
መደፍዕ, ፊስቶ, or ብርሚል			159.11 L
35	ጋሎን		4.546 L
140	4	ርብዒ, ርባዕ, or ሰፈር	1.136 5 L

Metric-linked system

							Metric
entelam or entelem							192 L
2 ⁷ / ₁₁	daula						88 L
8	3 ⁷ / ₃	ghebeta					24 L
10 ⁷ / ₃	4%	1 ¹ / ₃	tanica				18 L
32	14 ⁷ / ₃	4	3	cabaho			6 L
43 ⁷ / ₁₁	20	5 ⁷ / ₁₁	4 ⁷ / ₁₁	1 ⁴ / ₁₁	kunna or kouna		4.4 L
128	58 ⁷ / ₃	16	12	4	2 ¹⁴ / ₁₅	encá, encáa, or messé	1.5 L

29.6 Units of Weight

Two reported traditional systems

				Metric	Metric
gisla				168.508 kg	163.538 g
$194\frac{4}{30}$	natr			868.0 g	842.4 g
364	$1\frac{15}{16}$	rotolo or rottolo		462.9 g	449.3 g
5824	30	16	woket, wogiet, okia, or uqiya ^a	28.9 g	28.1 g

^aUsed for precious metals and civet

British Imperial-linked system for export

					Metric
dawala or dawulla					92.2 kg
2	ladan				46.1 kg
$5\frac{15}{17}$	$2\frac{19}{17}$	frasoulla, farasula, or frazula ^a			15.67 kg
20	10	$3\frac{7}{5}$	kunna, kouna, or kuna		4.608 kg

^aAlso reported as 17.972 kg (for rubber), 17.95 kg (for gum), 16.85 kg (for coffee), and 13.478 kg (for ivory)

British Imperial-linked system during the late eighteenth century

								Metric
gisla								163.293 kg
360	neter, netir, or metir (= 1 lb av)							453.592 g
525	1 ¹¹ / ₂₄	rotl						311.04 g
5250	14 ⁷ / ₁₂	10	mocha					31.104 g
6300	17½	12	1⅕	woket, wogiet, okia, or uqiya				25.92 g
17,500	63	33⅓	3⅓	2⅔	deben			9.33 g
63,000	175	120	12	10	3⅓	derime or dirhem (= 40 gr)		2.592 g
2,240,000	6222⅔	4266⅔	426⅔	355%	128	35%	pek	72.9 mg

British Imperial-linked system during the late nineteenth century

							Metric
kunna, kouna, or kuna							4.608 kg
5^{25}_{27}	natr						777.60 g
$11\frac{1}{6}$	$1\frac{7}{8}$	neter, netir, or metir					414.72 g
14^{23}_{27}	$2\frac{1}{2}$	$1\frac{1}{3}$	rotl				311.04 g
$148\frac{4}{27}$	25	$13\frac{1}{3}$	10	mocha			31.104 g
$177\frac{7}{9}$	30	16	12	$1\frac{1}{5}$	woket, wogiet, okia, or uqiya		25.92 g
$1\ 777\frac{7}{9}$	300	160	120	12	10	derime or dirhem (= 40 gr)	2.592 g

Metric-linked system

							Metric
dawala or dawulla							100 kg
2	ladan						50 kg
5^{15}_{17}	2^{19}_{17}	frasoulla, ferasla, or frasilla					17 kg
20	10	$3\frac{7}{8}$	kunna, kouna, or kuna				5 kg
$222\frac{2}{3}$	$111\frac{1}{3}$	$37\frac{1}{2}$	$11\frac{1}{2}$	neter			450 g
$3\ 555\frac{5}{6}$	$1\ 777\frac{7}{9}$	$604\frac{2}{3}$	$177\frac{7}{9}$	16	woket, wogiet, okia, or uqiya		28.125 g

Metric system (names in Tigrinya)

				Metric
ቶን				1000 kg
1000	ኪሎግራም			1 kg
100,000	100	ሰንቲግራም		10 g
1,000,000	1000	10	ግራም	1 g

30 Estonia [Formerly: Estonian Soviet Socialist Republic]

See also *Russia*.

After the Livonian Crusade, in 1219, Estonia was conquered by the Danes and the Teutonic Knights of Germany. In 1625, mainland Estonia came under Swedish rule. Following the Capitulation of Estonia and Livonia during the Great Northern War, the Swedish empire lost Estonia to Russia by the Treaty of Nystad in 1721. Estonia was then part of the Russian Empire, until it declared its independence in 1918. Estonia was formally incorporated into the USSR in 1940. Germany occupied Estonia from 1941 to 1944 and made it part of Ostland

(Courland, Estonia, Latvia, Lithuania, and parts of Belarus). The Soviet Union reincorporated Estonia into the USSR in 1944. The Republic of Estonia was formed in 1990, and declared its independence in 1991.

During the late seventeenth century, Swedish weights and measures influenced the system of measurement in Estonia. The Russian weights and measures became standard on October 11, 1835, and became extended by a ukase for the Baltic provinces in June 4, 1842. The metric system has been compulsory since January 1, 1929.

Main sources: [CARD], [EEST], [GBOT2], [KAHN], [KORH], [LAGM], [LEIN], [LIIV], [RÄNK], [SAAR], [SCH14], [TATE], and [VIIR]

30.1 Currency

- 2011–: 1 euro = 100 sent
- 1992–2011: 1 Estonian kroon = 100 senti
- 1944–1992: 1 Russian ruble = 100 kopeks

1941–1944	1 German ostmark
1940–1941:	1 Russian ruble = 100 kopeks
1924–1941:	1 Estonian kroon = 100 senti
1918–1927:	1 Estonian mark = 100 penni
1918:	1 Russian ruble = 100 kopeks
	1 German ostruble = 2 ostmark
	1 Finnish markkaa = 100 pennia
1721–1917:	1 Russian ruble = 100 kopeks
1609–1720:	1 Swedish riksdaler = 6 mark
1604–1608:	1 Swedish riksdaler = 4 mark
1561–1603:	1 Swedish daler = 4 mark
–1561:	During medieval times, several units of exchange were used, Such as the Novgorod grivna and the Krakow grzywna.

1 **vaks** = span;
 1 **mehesüld** or **lihasüld** = fathom;
 1 **kämmel** = palmbreadth;
 1 **peo** = handbreadth.

Estimated local Estonian system during the sixteenth century

					Metric
Liivimaa miil					7102 m
4400	süld				1.614 m
13,200	3	küünar			538 mm
26,400	6	2	jalg		269 mm
316,800	72	24	12	toll	22.42 mm

30.2 Units of Quantity

For printed paper and writing paper

riis		500 sheets	480 sheets
20	raamat	25 sheets	24 sheets

Swedish-linked system during the seventeenth century

					Metric
rootsi penikoorem					10,689.24 m
6000	süld				1.781 54 m
18,000	3	rootsi küünar			593.85 mm
36,000	6	2	jalg		296.92 mm
432,000	72	24	12	toll	24.744 mm

30.3 Units of Length

AS in other Uralic cultures, the Estonians used primitive natural measures:

1 **kukekiim** = the distance at which one can hear a cook;
 1 **samm** = pace;

Russian-linked system after 1835

								Metric
vene penikoorem^a								7467.532 968 m
7	verst							1066.790 424 m
3500	500	süld						2.133 580 848 m
10,500	1500	3	arssin					711.194 mm
14,000	2000	4	1⅓	küünar^b				533.395 mm
24,500	3500	7	2⅓	1¼	jalg			304.797 mm
168,000	24,000	48	16	12	6⅞	verssok		44.450 mm
294,000	42,000	84	28	21	12	1¾	toll	25.400 mm
2,940,000	420,000	840	280	210	120	17½	10 liin	2.540 mm

^aThis penikoorem was usually called a **vene penikoorem** (= Russian mile), to distinguish it from two other mile measures in use: 1 **rootsi penikoorem** (Swedish mile) = 10,689.240 m, and 1 **soome penikoorem** (Finnish mile) = 10 verst = 10,667.904 m

^b1 **küünar** (for surveying in southern Estonia) = 2 jalga = 609.594 mm

In Reval, present-day Tallinn, after 1835

			Metric
süld			2.244 200 m
7	jalg		320.600 mm
84	12	toll	26.717 mm

British Imperial-linked system during the early nineteenth century

				Metric
inglise penikoorem				1609.314 9 m
880	fathom			1.828 767 m
1760	2	inglise jard		914.383 mm
5280	6	3	inglise jalg	304.794 mm

Maritime system before 1928 and after 1928

		Metric	Metric
meremiil, merepenikoorem, or meresõlm		1854	1852 m
10	kaabeltau	185.4 m	185.2 m

Other units reported during the nineteenth century:

- 1 **geograafiline penikoorem** = 1/15 kraadi ekvaatoril = 6956 versta = ~ 7420.594 km;
1 **miil** = 1609.344 m.

30.4 Units of Area

For surveying during the seventeenth century

		Metric
tündrimaa ^a		5202.467 8 m ²
14,000	ruutküünar	37.160 5 dm ²

^aThe amount of land area required to grow 1 tündri of barley. This area varied according to location and period during the seventeenth and eighteenth centuries. Sometimes reported as 16,000 ruutküünart = 5945.677 5 m², and even as 18,000 ruutküünart = 6688.887 2 m²

Swedish/Russian-linked system in Reval, present-day Tallinn, during the eighteenth century

					Metric
tiin or dessantiin					10.925.201 352 m ²
2	tündrimaa or tonnestelle				5462.600 676 m ²
6	3	vakamaa ^a			1820.866 892 m ²
70	35	11⅓	kapp or kapamaa ^b		156.074 305 m ²
2400	1200	400	34⅔	ruutsüld	4.552 167 23 m ²

^aThis was later called a **tallinna vakamaa** (used in Tallinn), to distinguish it from the **riia vakamaa** (used in Riga).
1 tallinna vakamaa = 0.49 riia vakamaa
^bAlso reported as 148.64 m²

In Reval, present-day Tallinn, after 1802, based on [SCH14]

			Metric
tündrimaa or tonnestelle			6270.73 m ²
3	vakamaa		2090.24 m ²
35	11⅔	kapp or kapamaa	179.16 m ²

Russian scale after 1845

ruutpenikoorem										Metric
49	ruutverst									55,764,046.119 m ²
5 104 ¹ / ₂	104 ¹ / ₂	tiin								1,138,041.757 m ²
12,250,000	250,000		2400	ruutsild						10,925,20135 m ²
110,250,000	2,250,000	21,600	9		Ruutarssin					4,552 167 23 m ²
600,250,000	12,250,000	117,600	49	5 ¹ / ₂		ruutjalg				50,579 636 dm ²
28,224,000,000	576,000,000	5,529,600	2304		256	47	ruutverssok			9,290 137 2 dm ²
—	—	—	7 059 ³ / ₄₇		784	144	3 ³ / ₄₇	ruutfool		1,975 767 dm ²
—	—	—	—		78,400	14,400	306 ³ / ₄₇	100	ruutliin	6,451 484 2 cm ²
										6,451 484 2 mm ²

For land surveying during the nineteenth century

tündrimaa						Metric
1 ¹ / ₂						5202.467 8 m ²
35		vakamaa				3716.048 4 m ²
14,000		25	kapamaa			148,641 9 m ²
		10,000	400	ruutküünar		37,160 48 dm ²

Metric scale after 1929

ruutkilomeeter						Metric
100	hektar					1,000,000 m ²
10,000	100	aar				10,000 m ²
1,000,000	10,000	100	ruutmeeter			100 m ²
100,000,000	1,000,000	10,000	100	ruutdetsimeeter		1 m ²
10,000,000,000	100,000,000	1,000,000	10,000	100	ruutsentimeeter	1 dm ²
1,000,000,000,000	10,000,000,000	100,000,000	1,000,000	10,000	100	1 cm ²
						1 mm ²

30.5 Units of Volume

Russian-linked system

								Metric
kuuppeni-koorem								416.419 836 km ³
343	kuupverst							1.214 052 km ³
–	125,000,000	kuupsüld						9.712 417 m ³
–	3,375,000,000	27	kuuparssin					359.719 14 dm ³
–	–	343	49	kuupjalg				28.316 084 dm ³
–	–	–	4096	–	kuupver-ssok			87.822 056 cm ³
–	–	–	–	1728	–	kuuptoll		16.386 622 7 cm ³
–	–	–	–	1,728,000	5360	1000	kuupliin	16.386 622 7 mm ³

For timber during the twentieth century:

1 **steer** = 1 m³.

Metric system after 1929

				Metric
kuupmeeter				1 m ³
1000	kuupdetsimeeter			1 dm ³
1,000,000	1000	kuupsentimeeter		1 cm ³
1,000,000,000	1,000,000	1000	kuupmillimeeter	1 mm ³

30.6 Units of Dry Capacity

Some reported traditional measures:

- 1 **sületäis** = armful;
- 1 **kamalutäis**, **kamal**, or **ruhim** = double handful;
- 1 **peotäis** = handful;
- 1 **näputäis** = dash.

Old Livonian system during the sixteenth century

				Metric
tünder				137.76 L
2	vakk			68.88 L
12	6	külmit ^a		11.48 L
108	54	9	toop	1.275 L

^aAlso reported as **külmet**, **kilmitt**, and **kilmit**

For grain in Reval, present-day Tallinn, during the seventeenth century

						Metric
sälitis						3306.24 L
24	tünder					137.76 L
96	4	vakk ^a				34.44 L
288	12	3	külimit			11.48 L
768	32	8	2 ² / ₃	kapp		4.305 L

^aThe **vakk** was usually a hamper-like container made of wood or bark

For grain in Riga during the seventeenth century

						Metric
sälitis						2838.96 L
24	tünder					118.29 L
72	3	vakk ^a				39.43 L
216	9	3	külmit			13.14 L
2592	108	36	12	toop		1.095 L

^aAlso reported as 39.752 L

Russian-linked system formally used until 1835

						Metric
setvert						209.91 L
2	osmin					104.95 L
8	4	setverik				26.24 L
64	32	8	karnits			3.28 L
170⅔	85⅔	21⅔	2⅔	toop		1.23 L
12,800	6400	1600	200	75	kanttoll	16.4 mL

For grain in Reval, present-day Tallinn, before 1840 and after 1840

						Metric	Metric
sälitis						3447.36 L	3187.92 L
24	tünder					143.64 L	132.83 L
72	3	vakk				47.88 L	44.277 L
288	12	4	külmit			11.97 L	11.069 L
3456	144	48	12	toop		997.5 mL	922.4 mL
259,200	10,800	3600	900	75	kanttoll	13.3 mL	12.3 mL

Riga system in 1926, based on [TATE]

						Metric
sälitis						3051.0 L
24	tünder					127.125 L
72	3	vakk				42.375 L
216	9	3	külmit			14.125 L ^a
2592	108	36	12	toop		1.177 L
194,400	8100	2700	900	75	kanttoll	15.69 mL

^a[KAHN] reported 1 **kulmet** = 14.124 L, and according to Sven Aakjaer (Kong Valdemars Jordebog. 1943, p. 355.) = 14.12 L

In Reval, present-day Tallinn, during the late nineteenth century, based on [MART3]

						Metric
Last						3050.784 000 L
2	Last^a					1525.392 000 L
24	12	Tonne				127.116 000 L
72	36	3	Loof			42.372 000 L
216	108	9	3	Külmit		14.124 000 L
2592	1296	108	36	12	Stoof	1.177 000 L

^aFor lime, linseed and herring

In former Bishopric of Ösel-Wiek during the late sixteenth century

						Metric
sälitis						3270 L
2	pund					1635 L
24	12	tünder				136.25 L
60	30	2½	vakk			54.50 L
360	180	15	6	külmit		9.08 L

At Pärnu and Tartu during the eighteenth to nineteenth centuries

				Metric	Metric
sälitis				~3312 L	3744 L
24	tünder			~138 L	156 L
48	2	vakk		~69 L	78 L
192	8	4	külimit	~17.25 L	19.5 L

Swedish-linked system for French and Spanish salt in Reval, present-day Tallinn

			Metric
sälitis or last			2364.66 L
18	tünder		146.37 L
612	34	kapp	4.305 L

Russian-linked system for salt in Reval, present-day Tallinn

			Metric	Metric
sälitis or last			3050.784 000 L	2948.483 232 kg
18	tünder^a		169.488 000 L	163.804 624 kg
72	4	loof	42.372 000 L	40.951 156 kg

^aDefined as one Russian berkowetz

30.7 Units of Liquid Capacity

In Reval, present-day Tallinn, and Russian-linked system

								Metric	Metric
Vaat								532 L	491.976 L
10	ankur							53.2 L	49.197 6 L
40	4	pang or wedro						13.3 L	12.299 4 L
400	40	10	toop^a or kruschka					1.33 L	1.229 94 L
800	80	20	2	pudel				–	614.97 mL
1600	160	40	4	2	kortel or sorokovka			–	307.485 mL
1840	184	46	4 ³ / ₅	2 ³ / ₁₀	1 ³ / ₂₀	sotka or tsarka			267.378 mL
30,000	3000	750	75	37 ¹ / ₂	18 ³ / ₄	16 ⁷ / ₂₃	kanttoll	–	16.399 mL

^aAlso reported as 1.32 L

For wine in Reval, present-day Tallinn, during the nineteenth century

								Metric
suur vaat^a								604.423 L
1 ³ / ₁₀	vaat^b							464.941 L
2 ¹ / ₅	1 ¹ / ₃	härja-aam^c						278.965 L
3 ¹ / ₄	2 ¹ / ₂	1 ¹ / ₂	aam					185.976 L
13	10	6	4	ankur				46.494 L
97 ¹ / ₂	75	45	30	7 ¹ / ₂	veerand			6.199 L
390	300	180	120	30	4	toop		1.550 L
1560	1200	720	480	120	16	4	kvartal	387.45 mL

^aA large vaat, used for wine from Alicante and Portugal

^bFor Spanish wine

^cHogshead

In Reval, present-day Tallinn, during the late nineteenth century, based on [MART3]

						Metric
Fass^a						153.010 000 L
$4\frac{1}{16}$	Anker					37.664 000 L
$20\frac{1}{5}$	$5\frac{3}{25}$	Viertel				7.532 800 L
65	16	$3\frac{1}{8}$	Kanne			2.354 000 L
130	32	$6\frac{1}{5}$	2	Stoof		1.177 000 L
520	128	25	8	4	Quartier	292.250 mL

^aFor brandy

At Pärnu and Tartu during the nineteenth century

								Metric
härja-aam								229.14 L
$1\frac{1}{2}$	aam							152.76 L
6	4	ankur						38.19 L
90	60	15	kann					2.546 L
180	120	30	2	toop				1.273 L
288	192	48	$3\frac{1}{5}$	$1\frac{1}{5}$	pudel			795.625 mL
360	240	60	4	2	$1\frac{1}{4}$	pooltoop		636.50 mL
720	480	120	8	4	$2\frac{1}{2}$	2	kortel	318.25 mL

Metric system after 1929

						Metric
hektoliiter						100 L
10	dekaliiter					10 L
100	10	liiter				1 L
1000	100	10	detsiliiter			100 mL
10,000	1000	100	10	sentiliiter		10 mL
100,000	10,000	1000	100	10	milliliiter	1 mL

30.8 Units of Weight

Some reported traditional measures:

1 **seljatais** = the amount carried on the back of an ox, later estimated as less than 20 puuds = about 330 kg;

1 **kaenlatäis** = the amount carried under the arm;

1 **kandam** or **koorem** = a load for carrying;

1 **vedam** = a load for conveying;

1 **vinnam** = a load for pulling.

Swedish-linked system during the seventeenth to eighteenth centuries

								Metric
tonn								1030.560 kg
6	laevanael ^a							171.760 kg
20	3½	tsentner						51.528 kg
60	10	3	puut					17.176 kg
120	20	6	2	leisik				8.588 kg
2400	400	120	40	20	nakla or nael			429.400 g
76,800	12,800	3840	1280	640	32	luut		13.419 g
307,200	51,200	15,360	5120	2560	128	4	qvintin	3.355 g

^aAlso reported as about 168 kg

Russian-linked system during the eighteenth to nineteenth centuries

										Metric
sältisi										1965.660 kg
1 ^{29/31}	tonn									1015.590 kg
12	6½	kaal or perkovets								78 kg
120	62	10	puut							163.804 96 kg
120	62	10	puut							16.380 50 kg
240	124	20	2	leisik						8.190 25 kg
4800	2480	400	40	20	nakla or vene nael					409.512 41 g
76,800	39,680	6400	640	320	16	unts				25.594 52 g
153,600	79,360	12,800	1280	640	32	2	luut			12.797 26 g
460,800	238,080	38,400	3840	1920	96	6	3	solotnik		4.265 75 g
274,268,160	22,855,680	3,686,400	368,640	184,320	9216	576	288	96	dool	44.434 9 mg

Russian-linked system during the twentieth century

				Metric
nagöl				453.592 g
32	luut			14.175 g
96	3	solotnik		4.725 g
1536	48	16	untsi	295.3 mg

In Reval, present-day Tallinn, during the late nineteenth century based on [MART3]

					Metric
Schiffpfund					172.146 800 kg
20	Liespfund				8.607 340 kg
400	20	Pfund			430.367 g
12,800	640	32	Loth		13.449 g
51,200	2560	128	4	Quentschen	3.362 g

Other units reported during the nineteenth century:

- 1 **setvert** (for rye) = 360 naela = ~ 147 kg;
- 1 **setvert** (for barley) = 300 naela = ~ 123 kg;
- 1 **karaat** (for fine use) = 200 mg.

Metric system after 1929

					Metric
tonn					1000 kg
10	tsentner				100 kg
1000	100	kilogramm			1 kg
1,000,000	100,000	1000	gramm		1 g
1,000,000,000	100,000,000	1,000,000	1000	milligramm	1 mg

For medical use

		Metric
apteegi nael		358.323 g
84	solotnik	4.265 75 g

For medical use in Reval, present-day Tallinn

							Metric
Medicinal Pfund							357.853 800 g
1½	Mark						238.569 200 g
12	8	Unze					29.821 150 g
96	64	8	Drachme				3.727 644 g
288	192	24	3	Skrupel			1.242 548 g
5760	3840	480	60	20	Gran		62.127 mg
6165	4110	4 ¹¹⁰ / ₈	4 ¹¹⁰ / ₆₄	4 ¹¹⁰ / ₁₉₂	411/384	Ass	58.05 mg

For gold and silver in Reval, present-day Tallinn

				Metric
Mark				215.183 500 g
8	Unze			26.897 938 g
16	2	Loth		13.448 969 g
64	8	4	Quentschen	3.362 242 g

31 Ethiopia [Formerly: Abyssinia and Italian East Africa]

See also *Eritrea*.

One of the oldest set of remains of a human ancestor ever found was discovered in the Awash

Valley in present-day Ethiopia. Aksum, Ethiopia’s main ancestor state, was established before the first century BCE. Missionaries from Egypt and Syria reached the region in the fourth century and introduced Christianity. The rise of Islam during the Solomonic Dynasty caused the country to become isolated from European Christianity starting in the seventh century. The Portuguese re-established contact with the region in the sixteenth century, and tried to convert the population to Roman Catholicism. More than a century of religious conflict followed. From 1789 to 1855, the real power in the country lay in the hands of the dukes of the several regions into

which it was divided. Some of these states were reunited by the Emperor Theodore II in 1855 and some by the Emperor Tewodros in 1869. Ethiopia was incorporated into Italian East Africa from 1936 until 1941.

There were a wide variety of units of measurement in use before metrification. These units were often borrowed from several different civilisations, and provincial variations were usually considerable. It is no understatement to say that the region has had one of the most complex situations in terms of weights and measures. The metric system has been compulsory since 1963. Official recognition of the metric system came with the Weight and Measures Regulations Legal Notice No. 333 in 1967.

Main sources: [ALAM], [ARMB], [BAET], [BASS], [BEKE], [BERH], [CARD], [COLL3], [CONS], [COUL], [DABB], [DOMP], [DOUR], [ETHI]–[ETHI19], [EUR2], [FERM], [FERR3], [GANK], [GUID], [HEUG], [HEUG2], [HUFF], [ISEN], [KELL], [LEFE], [LESL], [LITT2], [MANT], [PANK], [PANK2], [PANK3], [PANK4], [PARK4], [PERI], [PLOW], [RODÉ], [ROSS5], [RÜPP], [SELL2], [SEMI], [STAT1949], [TANC], [UN55], [UN66], [WALK2], [WORQ], and [YOHA]

31.1 Currency

1976–:	1 Ethiopian birr = 100 santeems
1945–1976:	1 Ethiopian dollar = 100 cents
1942–1945:	1 East African shilling = 100 cents
1936–1941:	1 Italian lira = 100 centesimo
1931–1936:	1 Abyssinian birr = 100 metonnyas or matonas
1928–1931:	1 Abyssinian birr = 16 mähäleqs or mehaleks
1903–1928:	1 Abyssinian birr = 2 alads = 4 rubs or erubs = 8 temums = 16 gerš or piastres = 32 bessas
1893–1903:	1 Abyssinian talari or birr = 20 gerš = 40 bessas
1855–1893:	1 Maria Theresa Thaler = 2 alads = 200 amolés =

300 harfs = 12,000 diwanis = 18,000 kibeers = 54,000 birčiqos

–1855:

For large payments: 1 wakea of gold = about 80 salt bricks

At Harari: 1 Maria Theresa Thaler = 3 asrafis = 66 mähäleqs = 1452 plantains

At Massawa: 1 Maria Theresa Thaler = 24 – 48 harfs or dahabs

At Massawa: 1 harf or dahab = 4 diwanis or paras = 40 kibeers = 120 birčiqos (= glass beads)

Eighteenth century:

salt pieces weighing about 80 lbs, 40 lbs, 20 lbs, 10 lbs and 5 lbs

1 amolé (salt bar) = 4 kurmanas = 8 gedelas = 12 țats = 16 fotoqes

At Harari: 1 wäqét = 4 miskals = 48 gerš = 960 mähäleqs

Sixteenth to Seventeenth centuries:

Blocks of salt, 4 fingers broad and 3 fingers thick

The relative value of small monies at Massau during the late eighteenth century

sequin					
2¼	pataka or patacca				
81	36	harf			
324	144	4	diwani		
3240	1440	40	10	kibear or kebir	
9720	4320	120	30	3	borjooke ^a

^aGlass beads of all colours, perfect or broken

31.2 Units of Quantity

1 **koräja** (for straw mats, wooden planks, and cloth) = 24 or 25;

1 **räbta** (for goat and sheep skin) = 20;

1 **šekem** (in Amharic) or **baa** (in Gallinya) = a bundle of firewood;

1 **kum** (among the Wolaita people) = a bunch of vegetables.

For animal parts (usually cattles) after the slaughtering (in Amharic/Tigre)

ቅርጫ/ጉዚ	ብልት/መደብ	parts
qereča/guzi ^a		12
3	belet/mädäb	4

^aSometimes also reported as 8 or 7 parts

31.3 Units of Length

Since ancient times, there have been several different types of length measure in use, e.g., some units of measurement were based on the human body, some were influenced by terms used by trading cultures and some were based on the time required for a journey.

Some traditional Amharic and Tigre measures based on parts of the human body:

1 **Iyasu qumät** (አ.የሱ : ቁመት; literally “standing Iyasu”) or **yäsaw qumät** (የሰው : ቁመት) = the width of a man with two hands extended horizontally. It was reported as about 5 f. and 6 in.

1 **ermeja** (እርምጃ) or **segumti** (ስጉምቲ) = the distance between two feet while walking, a pace.

1 **kend** (ክንድ) or **emät** (አመት) = the distance from the elbow to the tip of the second finger; according to [PANK2], also formerly known as a **hend** (ኸንድ) or **henda** (ኸንዳ).

The Arabic term (**dera**) and the Harari term (**kuru**) for the cubit were also in common use.

It was estimated as 50 cm (by [PERI] and [TANC]), 48 cm (by [GUID]), 45 to 48 cm (by [DABB]), 45.7 cm (about 18 in., by [ARMB], [ISEN], [WALK2]), 45 cm (by [RODÉ]) and 44 cm (by [FERR3]).

1 **eger** (አግር), **egri** (አግሪ) or **čama** (ጫማ) = the length of a man’s foot or shoe. It was estimated as 28 cm (by [DABB]).

1 **senzer** (ስንዝር) or **sezer** (ስዝር) = the span between the thumb and the tip of the second finger. It was called a **sedri** (in Tegrēñña), **säder** (in Tegré), **senzer** (in Čaha), **zesser** (in Gallinña) and **zunzurii** (in Harari).

It was estimated as 24 cm (by [RODÉ]), 20 to 25 cm (by [HUFF]), 20 or 22 cm (by [TANC]) and as 20 cm (by [WALK2]).

1 **kubi** (ኩቢ) or **qelešem** (ቅልጽም) = the distance from the elbow to the wrist.

The **kubit** was usually used in the north, according to [TANC], and has usually been estimated as about 32 cm.

1 **gat** (ጋት), **ṣat** (ጻት) or **fah** (ፋሕ) = the breadth of four fingers placed flat. It was estimated as 3–4 in (by [ARMB]) and 7–9 cm (by [TANC]). The Eritrean Report of 1937 reported it as 9 cm in the highlands, but only 7.6 cm in the lowlands.

1 **ṭat** (ጣት) = the breadth of the index finger.

Many scholars have tried to find mathematical relationships between these various units of measurement, e.g., 1 kend = 2 senzers + 2 ṭats. It is probable that no uniform system for units of length existed until the late nineteenth century. Longer distances were traditionally measured in terms of the amount of time required to travel them by foot or by mule. There was also a system of measurement, based on the ancient Greek system, used for longer distances.

Greek-linked system for longer distances

ፈረስክ	ምዕረፍ	Metric
färäsek		5550 m
30	me’raf ^a	185 m

^aAccording to [LITT2], there were three types of me’raf in use, namely a unit equal to 200 senzers = about 48 m, a unit of 185 m and a unit of 700 kends = about 330 m

Units of measurement based on the time required for a journey:

1 **amät** (ዓመት) = a one year journey;

1 **wäreha** (ወርህ) = a one month journey;

1 **elät** (ዕለት) = a one day journey; [FERR3] estimated it as about 5 or 6 leagues in Tegré for a mule caravan, almost double that;

[LEFE] estimated it as about 3 marine leagues (about 16.8 km) for a mule and about 6 or 7 marine leagues (about 33.6 km or 39.2 km) for a man on foot.

Other measures reported during the eighteenth to nineteenth centuries:

1 **alabi** = ~ 0.8 m;

1 **Baymot cubit** = about 665 mm; according to [MANT], the span was measured, during the reign of Menelik, on a man of enormous height named Baymot. This cubit was used in the measurement of land (see below).

For medical prescriptions, the actual finger was sometimes indicated, e.g., **asabe'e abiy** or **awra tat** (the thumb) and **nestit asab'e** or **tenneš tat** (the little finger).

During the nineteenth century, various units of measurement were adopted from different trading partners, such as the Arab countries, the Ottoman Empire and Britain.

Arabian-linked system during the mid-nineteenth century

		Metric
dera		623.62 mm
8	robi	77.95 mm

Upper scale of Ottoman/British Imperial-linked system used at the coast during the mid-nineteenth century

					Metric
färäsek					5.068.703 km
3	berri				1.689.568 km
5 543¼	1 847¾	yard			914.392 mm
7391	2 463¾	1½	pik halébi^a		685.794 mm
11,086½	3 695½	2	1½	pik habeci	457.196 mm

^aThe pik of Constantinople. There was also a pik called the Turkish pik = 685.787 8 mm. Other reported pik-measures in use were the **pik hendasi** = about 630 mm, the **pik hindi** = about 627 mm, the **pik beledi** = about 560 mm and the **pik Stambuli** (the pik of Istanbul) = 677 mm

Lower scale of Ottoman/British Imperial-linked system used at the coast during the mid-nineteenth century

					Metric
pik habeci					457.196 mm
1½	foot				304.797 mm
2	1½	senzer			228.598 mm
6	4	3	gat		76.199 mm
18	12	9	3	inch	25.400 mm
19⅘	12⅘	9⅘	3⅘	1⅘	tat 23.812 mm

The land was first systematically measured during the reign of Iyasu I (1682–1706) in Bägémder, and later during the reign of Menelik II (1889–1913) in the southern provinces.

For surveying during the seventeenth century, based on [DABB] and [GUID]

የመድኃኒት:	ክንድ	Metric
gämäd^a		19 m
40	kend	0.475 m

For surveying during the early nineteenth century, based on [DABB]

ቃዳ or ካዳ	ክንድ	Metric
qada or kada^a		63 m
132	kend	477.3 mm

^aConsisted of 33 sticks, each 4 kend long. According to [BAET], it was long used in the Gondar area

During the reign of Menelik II, the cords used for surveying were much longer. According to [HUFF], the cords (rope or thong) varied between 60 and 100 metres according to the location. As the length of the rope also varied in accordance with the weather, it was later abandoned in favor of a wire.

For surveying in Harari, based on [PANK2]

የመድኃኒት:	ክንድ	Metric
garada		75 m
156¼	kend	0.48 m

For surveying, based on [GUID]

የመድኃኒት:	ክንድ	Metric
gämäd		72 m
150	kend	0.48 m

For surveying, based on [MANT] and [WORQ]

		Metric
qālad or kēlad ^a		66.75 m
133	Baymot cubit	502 mm

^aIt was reported as 132 kend by [BERH]

For surveying in Asela, based on [PANK2]

የመድገ፡	ከንድ	Metric
qālad		60 m
125	kend	0.48 m

For surveying, based on [WALK2]

የመድገ፡	ከንድ	Metric
gāmād		57 m
120	kend	0.475 m

For surveying in the Arsi Province, based on [PANK2]

የመድገ፡	ከንድ	Metric
qālad		48 m
100	kend	0.48 m

Some measures reported as used for measuring cloth:

- 1 **ṭaqa** = 56 kends (according to a contemporary informant referred to by [PANK2];
 1 **gabi** = 20 kends (according to [DABB] and [GUID]), it was reported as a **šamma** by [ALAM];

1 **qerāna** = 10 kends (according to [ALAM], [GUID], and [ISEN]) or 6 kends (according to [ROSS5]);

1 **ak** or **aq** = 4 kends (according to [BAET]) or 2 māqačo (according to [PANK2]);

1 **gārdab** or **gerdab** = 3 kends (according to [LITT2]), 5 kends (according to [ALAM], [DABB], [GUID], and [ISEN]) or 6 kends (according to [ROSS5]);

1 **māqača** = 3 kends (according to [GUID]);

1 **esil** = 2 or 3 kends (according to [GUID] and [BAET]);

1 **kābib** = 4 or 5 kends (according to [LITT2]).

Metric-linked system reported during the late nineteenth century, based on [CARD]

ከንድ	ስንዝር	ጋት	ጣት	Metric
kend				49 cm
3 ¹ / ₁₆	senzer			16 cm
6 ¹ / ₈	2	gat		8 cm
19 ³ / ₅	6 ² / ₅	3 ¹ / ₅	ṭat	2.5 cm

Metric-linked system after 1963

ከን	ጣጣንድ	የመድገ፡	ከንድ	ስንዝር	Metric
kan					25,000 m
250	gemand				100 m
384 ¹ / ₁₃	1 ¹ / ₁₃	kēlad			65 m
50,000	200	130	kend		500 mm
125,000	500	325	2 ¹ / ₂	senzer	200 mm

Metric system after 1967

ሄክቶሜትር	ሜትር	ዴሲሜትር	ስቲግሜትር	ሚሊሜትር	Metric
héketométer					10 m
10	méter				1 m
100	10	désiméter			100 mm
1000	100	10	säntiméter		10 mm
10,000	1000	100	10	miliméter	1 mm

31.4 Units of Area

A new land tenure system, the *qälad* or *gaša* system, was begun in Shewa in 1879–1880, during the reign of Menelik II (1844–1913). See also [PANK, pp. 120–121]. According to [WORQ], a land measurement, also called the *qälad* system, had already been introduced in the northern Shewa region by Yekuno Amlak in the 1270s. A land proclamation of 1909–1910 required the measurement of all land and its redistribution to the central government. *Qälad* was the term for a cord made of fiber or, more often, leather that was later applied to a piece of land measured by a rope 67 metres long. A rectangle, 8 ropes-wide and 11 ropes-long, usually constituted a *gaša*, but the size of the *gaša* varied between about 24 ha and 120 ha, depending on population density and quality of soil. The term *gaša* has also been described as an area of land that has been cultivated in return for military service. According to [STAT1949], one *gaša* varied between 15×25 kélads and 7×11 kélads. Anyhow, the measure of land areas was not very exact, according to [SELL2], as account was never taken of irregularities in the level of the land and the sides of the plots were seldom parallel.

According to [MANT, pp. 81–82], the size of a *gaša* (ገሳ) was determined by the situation and the quality of the soil as below:

- 1 **gaša** (on low lying plains (*mēda*), which were freshly scorched where the land was not very fertile and becomes barren after 6–7 years of cultivation) = 20×9 kélads = about 70 ha;
- 1 **gaša** (on fertile plains that are situated at high altitudes on plateaus (*dega*), where barley, broad beans and peas were cultivated) = 15×9 kélads = about 60 ha;
- 1 **gaša** (on sandy and stone-ridden soils that were covered in craters and where the sun and the wind combined to depress the crop and cattle was set to graze) = 13×9 kélads = about 60 ha;
- 1 **gaša** (on fertile mountain slopes (*weyna dega*), on which barley, broad beans, grain, *tíkúr téf*,

and *zengada* could be cultivated) = 12×8 kélads = about 47 ha;

- 1 **gaša** (on barren soil (*girgira*) in the valleys, where the land was sandy and dry and cattle was put out to graze) = 12×8 kélads = about 47 ha;
- 1 **gaša** (on fertile soils in the valley (*kólla*), on which berbere, cotton, nashilla, *nech'téf*, and *zengada* could be cultivated) = 11×7 kélads = about 34 ha.

Another widely-used unit of land measure was the area ploughed in a day by a pair of oxen. According to reports published during the late 1960s by the Central Statistical Office, the unit had the following values in each province:

- 1 **temad** (ጥማድ) = 1440 m² in the Arsi Province;
- 1 **temad** (ጥማድ) = 1272 m² in the Begmender Province;
- 1 **temad** (ጥማድ) = 1185 m² in the Gamu-Gofa Province;
- 1 **temad** (ጥማድ) = 1505 m² in the Gojjam Province;
- 1 **temad** (ጥማድ) = 1735 m² in the Hararghe Province;
- 1 **temad** (ጥማድ) = 1547 m² in the Shewa Province;
- 1 **temad** (ጥማድ) = 1170 m² in the Wollo Province.

In the Welega Province, this unit was called a **mesa** and was reported as about 1329 m², and in the Harari region, there was yet another name for the unit.

System used in the Hararghe Province

			Metric
jarib			60×60 kends = 1296 m ²
2	nus jarib		648 m ²
4	2	rub jarib	324 m ²

The area effectively worked in one ploughing by a pair of oxen was called one **gäzem** (ገዝም), and was reported by the Central Statistical Office

as 1357 m² in the Gojjam Province and 1189 m² in the Shewa Province.

The Central Statistical Office also reported a land measure equal to the amount of land worked without oxen in a day:

1 **qān** (ቀን) = 199 m² in the Gamu-Gofa Province;

1 **qān** (ቀን) = 1681 m² in the Shewa Province;

1 **qān** (ቀን) = 1481 m² in the Wollo Province;

Other measures reported for land areas:

1 **kélad**, **khalad**, **qalaad**, or **kalad** (a rectangular plot of land) = varying between about 3900 and 4900 m²; according to [MANT], usually about 4356 m²;

1 **fär** (ፈር; in Shewa) = about 1217 m²;

1 **masa** (ማሳ) = 986 m² (in Gojjam), 1070 m² (in Wollo) and 2633 m² (in Shewa);

1 **boy** (ቦይ; in Shewa) = about 700 m²; it was also reported as used in Sidamo, but the variations here were too great for reliability's sake;

1 **telem** (ትልም; in Wollo) = about 269 m²;

1 **mäbäd** (መጽፈ; in Shewa, Tigray and Wollo) = varying greatly between about 50 and 255 m²;

1 **pic halébi**² = 47.032 16 dm²;

1 **dera merabba** = about 54.5 cm².

Metric system after 1967

ሐ.ከታር	ሜትር:ከሬ	Metric
héktar		10,000 m ²
10,000	méter karé	1 m ²

31.5 Units of Dry Capacity

During the late nineteenth century

							Metric	Metric
cafiso ^a							317.088 L	320.205 312 kg
5 ² / ₁₇	gome (in Gondar)						59.894 4 L	60.483 226 kg
30	5 ² / ₃	ardeb ^b (in Massau)					10. 569 6 L	10.673 510 kg
72	13 ² / ₅	2 ² / ₅	ardeb (in Gondar)				4.404 L	4.447 296 kg
720	136	24	10	madega			440.4 mL	444.729 6 g
8640	1632	288	120	12	unze (in Gondar)		–	37.061 g
103,680	19,584	3456	1440	144	12	drachme (in Gondar)	–	3.088 g

^aAlso reported, during the early twentieth century, as about 317.47 L

^bAlso reported, see [KELL], as about 11.746 L

For grain in the northern Tigre-speaking areas, based on [BASS]

እን.ገ.ገም	ያኒት	ገበታ	ዕሲ	ምሳ	እንቅዓ	ሥልዖ	Metric
enetälam							~160 kg
2	yahit						~80 kg
8	4	gäbäta					~20 kg
32	16	4	esi				~5 kg
128	64	16	4	mesa			~1.25 kg
341 ¹ / ₃	170 ² / ₃	42 ² / ₃	10 ² / ₃	2 ² / ₃	enqe'a		~469 g
1024	512	128	32	8	3	sele'o	~156 g

For grain in the northern Tigre-speaking areas, based on [DABB, p. 520] and [PARK4, p. 191]

እን.ገ.ገም	ማዴጋ	ምስ	Metric
enetälam			273.92 L
8	madega		34.24 L
128	16	mäsé	2.14 L ^a

^aThe mean value of three measures made by [DABB], 2.042 463 L, 2.088 05 L and 2.280 15 L

For grain at Serae, Hamasén and Akele Guzay, based on [PERI, p. 433]

ከዕቢ	አን.ላም	ያኒት	እንቅፈቲ	ገበታ	ምስላሽ	ኸበ	ምዕሮ	እንቅዓ	ኸፋሎ	ሥልፆ	Metric	Metric
ka'ebi											816 L	496 L
2	enetālam										408 L	248 L
4	2	yahit									204 L	124 L
8	4	2	enefeqeti								102 L	62 L
16	8	4	2	gābāta							51 L	31 L
21⅓	10⅔	5⅓	2⅔	1⅓	meselas						38.250 L	23.250 L
64	32	16	8	4	3	ka'ābo					12.750 L	7.750 L
128	64	32	16	8	6	2	me'ero				6.375 L	3.875 L
256	128	64	32	16	12	4	2	enqe'a			3.187 L	1.937 L
512	256	128	64	32	24	8	4	2	kefalo		1.594 L	969 mL
1024	512	256	128	64	48	16	8	4	2	sele'o	797 mL	484 mL

Upper scale for grain in the northern Tigre-speaking areas, based on [TANC, pp. 136–7]

ከዕቢ	አን.ላም	መገጸ	ያኒት	እንቅፈቲ	ገበታ	ምስላሽ	ሕፋፍ	ኸበ	Metric
ka'ebi									637.44 L
2	enetālam								318.72 L
2⅔	1⅓	māgāsa							239.04 L
4	2	1½	yahit						159.36 L
8	4	3	2	enefeqeti					79.68 L
16	8	6	4	2	gābāta				39.84 L
21⅓	10⅔	8	5⅓	2⅔	1⅓	meselās			29.88 L
32	16	12	8	4	2	1½	nefeqi		19.92 L
64	32	24	16	8	4	3	2	ka'ābo	9.96 L

Lower scale for grain in the northern Tigre-speaking areas, based on [TANC, pp. 136–7]

ካዕቢ	ምዕሮ	እጎቅዓ	ኸፋሎ	ስልስቶ	ሥልፖ	Metric
ka'äbo						9.96 L
2	me'ero					4.98 L
4	2	enqe'a				2.49 L
8	4	2	kefalo			1.245 L
12	6	3	1½	seleseto		830 mL
16	8	4	2	1½	sele'o	622.5 mL

For grain by the Jews in the northern Tigre-speaking areas, based on [ELLE], [SEMI, pp. 43–52] and [PANK3, p. 119]

ካዕቢ	እጎ.ላ.ላም	ያኒት	እጎቅረቲ	ገቢታ	ጎፍቂ	ካዕቢ	ምዕሮ	እጎቅዓ	ጎጣሴ	ሥልፖ	ምኒልክ	ፈረቃ:ሥልፖ	Metric
ka'ebi													634.9 L
2	enetälam												317.4 L
4	2	yahit											158.7 L
8	4	2	enefeqeti										79.36 L
16	8	4	2										39.68 L
32	16	8	4	gäbata									19.92 L
64	32	16	8	4	2								9.96 L
128	64	32	16	8	4	ka'äbo	me'ero						4.98 L
256	128	64	32	16	8	4	2	enqe'a					2.49 L
512	256	128	64	32	16	8	4	2	gomisé				1.245 L
1024	512	256	128	64	32	16	8	4	2	sele'o			622 mL
1536	768	384	192	96	48	24	12	6	3	1½	menilek ^a		415 mL
6144	4608	2304	1152	576	288	96	48	24	12	6	4	färäqa sele'o	104 mL

^aA measurement based on imported conical enamel drinking cups

For grain in the northern Tigre-speaking areas, based on [COLL3, p. 9]

ካዕሲ	አንገላም	መገጸ	የኒት	አንቅፋቲ	ገቢታ	ምስለሽ	ንፍቂ	ኸበ	ምዕሮ	አንቅፋ	ኸፋሎ	ሰሌዕቶ	ሥልፆ	Metric
ka'ebi														637.44 L
2	enetālam													318.72 L
2⅔	1⅓	mägäsa												239.04 L
4	2	1½	yahit											159.36 L
8	4	3	2	enefeqeti										79.68 L
16	8	6	4	2	gäbäta									39.84 L
21⅓	10⅔	8	5⅓	2⅔	1⅓	meseläs								29.88 L
32	16	12	8	4	2	1½	nefeqi							19.92 L
64	32	24	16	8	4	3	2	ka'äbo						9.96 L
128	64	48	32	16	8	6	4	2	me'ero					4.98 L
256	128	96	64	32	16	12	8	4	2	enqe'a or mesé				2.49 L
512	256	192	128	64	32	24	16	8	4	2	kefalo			1.245 L
768	384	288	192	96	48	36	24	12	6	3	1½	selesto		830 mL
1024	512	384	256	128	64	48	32	16	8	4	2	1⅓	sele'o	622.5 mL

For grain in the northern Tigre-speaking areas, based on Dr Makonnen Fäqadu, according to [PANK3, p. 120]

አንገላም	ወራይ	ገቢታ	ምስለሽ	ንፍቂ	ኸበ	ምዕሮ	አንቅፋ	ኸፋሎ	ሰሌዕቶ	ሥልፆ	Metric
enetālam											265.60 L
1⅓	wäray										199.20 L
8	6	gäbäta									33.20 L
10⅔	8	1⅓	meseläs								24.90 L
13⅓	10	1⅔	1¼	nefeqi							19.92 L
26⅔	20	3⅓	2½	2	ka'äbo						9.96 L
53⅓	40	6⅔	5	4	2	me'ero					4.98 L
106⅔	80	13⅓	10	8	4	2	enqe'a				2.49 L
213⅓	160	26⅔	20	16	8	4	2	kefalo			1.245 L
320	240	40	30	24	12	6	3	1½	seleseto		830 mL
426⅔	320	53⅓	40	32	16	8	4	2	1⅓	sele'o	622.5 mL

For grain in the northern Tigre-speaking areas, based on Amanuʼel Yohannes, an informant, according to [PANK3, p. 121]

ገቢታ	ምስላሽ	ገፍቂ	ገፍፂጃፂ	ኸባቦ	ምዕሮ	እገቅጻ	ምኒልክ	ኸፋሎ	Metric
gābāta									13.28 L
1⅓	meselās								9.96 L
2	1½	nefeqi							6.64 L
3⅓	2⅔	1⅔	gwedegwado						4.15 L
4	3	2	1¼	kaʼābo					3.32 L
5⅓	4	2⅔	1⅔	1⅓	selesta mesé				2.49 L
8	6	4	2½	2	1½	meʼero			1.66 L
16	12	8	5	4	3	2	enqeʼa or mesé		830 mL
32	24	16	10	8	6	4	2	menilek	415 mL
64	48	32	20	16	12	8	4	kefalo	207.5 mL

For grain in the northern Tigre-speaking areas, based on [ROSS5, p. 95]

እገብላም	መገጸ	ያጊት	እገቅፈቲ	ገቢታ	ምስላሽ	ገፍቂ	ኸባቦ	ምዕሮ	እገቅጻ	Metric
enetālam										358.56 L
2	māgāsa									179.28 L
3	1½	yahit								119.52 L
6	3	2	enefeqeti							59.76 L
12	6	4	2	gābāta						29.88 L
36	18	12	6	3	meselās					9.96 L
54	27	18	9	4½	1½	nefeqi				6.64 L
108	54	36	18	9	3	2	kaʼābo			3.32 L
216	108	72	36	18	6	4	2	meʼero		1.66 L
432	216	144	72	36	12	8	4	2	enqeʼa	830 L

For grain in the the Bilén country and at Keren, based on [PERI, p. 435]

ገበታ	ዕቢላ	ከፋሎ	ስልስቶ	ገበሽልፆ	ሕፍን	Metric	Metric
gābāta						124.8 L	96 kg
4	ebēla					31.2 L	24 kg
24	6	kefalo				5.2 L	4 kg
48	12	2	šele'o			2.6 L	2 kg
96	24	4	2	gābāšele'o		1.3 L	1 kg
192	48	8	4	2	hefen	0.65 L	0.5 kg

For grain in the Mänsa area, based on [RODÉ]

ባረኛ	ገበታ	ዕቢላ	ከፋሎ	ስልስቶ	እርኬት or ተጌት	Metric
barāna						~288 L
6	gābāta					~48 L
24	4	ebēla				~12 L
96	16	4	kefalo			~3 L
192	32	8	2	šele'o		~1.5 L
288	48	12	3	1½	arakét or tāgét	~1 L

For grain in the western Tigre-speaking areas, based on [LITT2]

ቆር or እንተላም	ምከላት	ባተ	ገበታ	ከፋሎ	ቆርባተ	ገቦ or ዑፍ	ሸከና	Metric
qor or enetālam								~300 L
4%	mekelat^a							~72 L
10	2½	bat						~30 L
16⅔	4	1⅓	gābāta					~18 L
100	24	10	6	kefalo				~3 L
150	36	15	9	1½	qorbat			~2 L
400	96	40	24	4	2⅔	gābo or 'uf		~750 mL
800	192	80	48	8	5⅓	2	šākāna	~375 mL

^a[TANC] reported it as a **bishani**

Amharic system in Basso, based on [BEKE] and [GUID]

ጫን	ማድጋ	ቆና				Metric
čan						460.29 L
30	madega					15.34 L
180	6	qunna^a				2.56 L
720	24	4	efeya			639 mL
1800	60	10	2½	derego^b or silayo		256 mL

^aReported as about 4½ Imperial pints

^b[BEKE] reported it as a quantity sufficient to make a loaf of bread

Amharic system, based on [ALAM]

ጫን	ማድጋ		ላዳን	ቁና	ምስ	ከፋሎ	ድርጎ	Metric
čan								~192 L
8	madega							~24 L
16	2	nafé						~12 L
32	4	2	ladan					~6 L
64	8	4	2	qunna				~3 L
128	16	8	4	2	māsé			~1.5 L
256	32	16	8	4	2	kefalo		~0.75 L
512	64	32	16	8	4	2	derego	~0.375 L

Amharic system, based on [ISEN]

፳፯			፳፯	
ḥan				
4½	dawula			
6	1¼	mäseläs		
8	1⅔	1⅓	madega	
96	20	16	12	mäsé^a or qunna

^aUsually considered as 1/16 madega. See system based on [ALAM] above

Amharic system in Shewa region, based on [BAET]

፳፯					ቁኝ	
ḥan ^a						
10	dawula					
20	2	eneqeb^b, aser fāj, madega^c, dergo^d, or ladan^e				
30	5	2½	bédo			
60	10	5	2	gurezen		
120	20	10	4	2	qunna	
240	40	20	8	4	2	erebo

^aReported as equal to 10 madega in Gondar and Semén

^bVaried between 10 and 13 qunna

^cReported as 10 or 16 qunna

^dReported as 4 or 10 qunna

^eReported as 2, 4 or 10 qunna

Amharic system in Shewa region, based on Germa Fäyesa, an informant from Shewa, according to [PANK3, p. 138]

dawula				
2	eneqeb			
4	2	gurezen		
20	10	5	qunna	
80	40	20	4	erbo

The qunna varied considerably, both by region and over time.

[HEUG] reported it as 1/9 madega.

[DABB] reported it as the amount of bread required to feed five Ethiopians for a day, or = 1/16 madega.

At Basso = 2.516 L, according to [DABB];

At Dambäčä = 3.198 L, according to [DABB], or 4396 L ([DABB]);

In Gondar = 3 L, according to [ALAM], 4.5 L ([MOND]), 4.56 L ([DABB]), 4.67 L

([DABB], [GUID] and [SERR]), or 5 L ([DOCH]);

In Wällo = 8 Menilek cups or a basket with a diameter of 27 cm at the top, 8 cm at the base and 12 cm in height.

At Karayu and Yerer in the Shewa Province, during the twentieth century, the qunna (ቁኝ) was reported as below:

1 **qunna** (for ṭéf) = varied between 3.2 and 5.4 kg;

1 **qunna** (for wheat) = varied between 2.9 and 5.1 kg;

1 **qunna** (for barley) = varied between 3.0 and 3.9 kg;

1 **qunna** (for sorghum) = varied between 3.3 and 4.9 kg;

1 **qunna** (for maize) = varied between 3.3 and 5.0 kg;

1 **qunna** (for peas) = varied between 3.5 and 5.0 kg;

1 **qunna** (for beans) = varied between 4.0 and 5.5 kg;

1 **gunna** (for lentils) = varied between 3.5 and 4.2 kg;

1 **gunna** (for chickpeas) = varied between 4.5 and 6.9 kg.

Other reported measures:

1 **ladan** (for staple crops and barley) = the capacity of a large goatskin bag;

1 **aqmada** (for grains) = the capacity of a large sheepskin or goatskin bag;

1 **ayebāt** (in the northern Tigre-speaking areas, a container made from a large cow skin for carrying grain) = 4 keša;

1 **fanega** or **quartago** = 55.5 L;

1 **tārānešewa** (in the northern Tigre-speaking areas, for grain) = 10–15 rebe'it;

1 **leoqota** or **läqota** (in the northern Tigre-speaking areas, for grain) = about 24 kg;

1 **irbita** or **oibita** (for grain, used by the Kunama people) = about 5 L;

1 **iskidada** (a small basket for grain, used by the Kunama people) = almost 5 L;

1 **waheyo** (in the northern Tigre-speaking areas, for flour) = 2 rebe'it;

1 **rebe'it** (in the northern Tigre-speaking areas, for grain) = about 4 kg;

1 **kemobeta** (in the northern Tigre-speaking areas, for grain) = about 3 kg;

1 **barena** (in the northern Tigre-speaking areas, for grain) = no more than about 3 kg;

1 **mekelat färäs, ebēla** or **med** (in the western Tigre-speaking areas, for grain) = about 2.5 kg;

1 **rubaya** (on the coast, for grain) = about 1.8 L;

1 **qārehét** (in the northern Tigre-speaking areas, for grain) = a small basket of unknown size;

1 **čan** (in the northern Tigre-speaking areas, for grain) = 8 madega;

1 **wekét** (for coffee) = a handful of coffee.

the names of the vessel in which the liquids were stored, transported or sold. As for the solids, these measures differed by location and over time.

Some containers of unknown size, according to [PANK2], mentioned in Geez literature, in which liquids were stored:

māsebeket, qāsut, māzegāb and **māsāleset**.

Some containers of unknown size, according to [PANK2], used in the Tegrēñña-speaking areas, in which butter or honey was stored:

gābāta (for honey), **kā'ēbo** (for honey), **māsi** (for honey), **daberi** (for honey), **madega** (for honey), **qwera'e** (for butter), **me'ero** (for butter), **nefeq** (for honey), **koleba** (for honey), **hareb** (for honey), and **enqe'a** (for honey).

Some other reported containers used for honey:

1 **māgala** = about 10 kg;

1 **fiyo** = about 4 L;

1 **ṭasa** = about 3 L.

For honey and civet

gundo or goundo ^a	
10	waneča ^b

^aReported as varying between 2 and 4 kúnna = about 8–16 L. According to [GANK], it was usually about 15 L, while [WORQ] reported it as about 19 kg in fertile regions and about 10 kg in areas that were less well-cultivated

^b[RÜPP] reported it as weighing 30 oz, [HEUG2] as 400 drams, and [PLOW] as 450 drams

For butter, honey and oil, based on [TANC]

	Metric
goba	~2 L
80	ghila ~25 mL

31.6 Units of Liquid Capacity

Liquids were measured according to a number of different units. These were often no more than

For local beer and mead

genbo ^a or dabrē	
3	mabrejja

^aA pottery container

For local beer and mead

			Metric
bāremil			~210 L
8–10	dāmebāzan		~21–26 L
160–300	20–30	feyasko	~0.7–1.3 L

For water

			Metric
tākazā			~ 3600 L
12	gārāwāña		~ 300 L
36	3	jereba	~ 100 L

Some types of imported bottle that, according to [PANK2], were used for measuring:

- 1 **feyaseko** = about 2 kg;
- 1 **berašo** = about 2 L;
- 1 **aranečata** = about 500 mL;
- 1 **qerarät** = about 500 mL;
- 1 **abaqit** = about 250 mL.

Some tins that, according to [PANK2], were used for measuring:

- 1 **gārāwana**, **gārāwayna**, **gārāwāña**, or **gārāwāñña** = 10 feyaskos = about 8 L;
- 1 **šeguṭ** or **šegwut** = about 500 mL;
- 1 **kod** = about 500 mL;
- 1 **gazuza** = about 250 mL;
- 1 **tanika** = a small tin of specific size.

For butter and honey among the Mänsa people, based on [RODÉ]

					Metric
mācefär					~16 L
2	ankatkäta				~8 L
4	2	waneča			~4 L
8	4	2	qobät or qob		~2 L
16	8	4	2	rebe'e	~1 L

For milk among the Mänsa people, based on [RODÉ]

			Metric
qärobat ^a			~10–15 L
2½–5	'emur ^b		~3–6 L
13½–20½	4–8	tänäkät ^b	~0.73 L

^aA leather bag

^bA container of palm leaves

Among the Mänsa people, based on [LITT]

		Metric
bat		~30 L
15	qobat	~2 L

Some other measures used by the Mänsa people:

- 1 **mädhanät** (for butter, according to [RODÉ]) = about 16 L;
- 1 **madhur** (for milk, according to [DABB]) = 696.5 – 717 mL.

For honey in Gondar among Amharic-speaking people, based on [ALAM]

								Metric
čan								~384 L
8	madega							~48 L
16	2	nafe						~24 L
32	4	2	ladan					~12 L
64	8	4	2	qunna				~6 L
128	16	8	4	2	mase			~3 L
256	32	16	8	4	2	kefalo		~1.5 L
512	64	32	16	8	4	2	dergo ^a	~750 mL

^aLater, according to [CONS, p. 28], also reported as about 1.22 L

During late nineteenth century

						Metric
ardeb (long)						10.601 11 L
$1\frac{7}{23}$	medane					8.127 52 L
$2\frac{7}{5}$	$1\frac{21}{25}$	ardeb (short)				4.417 13 L
60/23	2	$1\frac{7}{23}$	kúnna			4.063 76 L
240/23	8	$4\frac{8}{23}$	4	kuba, cuba, or menelik^a		1.015 94 L
24	$18\frac{7}{5}$	10	$9\frac{7}{5}$	$2\frac{7}{10}$	madega	441.7 mL

^aOften used for honey

Metric-linked system

			Metric
Tanika			20 L
4	kúnna		5 L
$66\frac{7}{5}$	$16\frac{7}{5}$	kubaya	300 mL

Other reported measures:

1 **calões** (a large jug) = 16.8 L.

31.7 Units of Weight

[PANK4] identified three types of weight concept. Firstly, vague ideas of heaviness or lightness obtained merely by hefting objects in the hand; secondly, concepts like the maximum weight conveniently carried by the human porter, the donkey, mule or camel; and thirdly, the use of some kind of weighing apparatus.

Expressions for the concept of the load:

- in Amharic-speaking areas: **čenat** = a donkey load, **čan** = a mule load, and **šekem** = the amount carried on human shoulders.
- in Gallinya-speaking areas: **feisa** or **feifni** = a load.
- in Harari-speaking areas: **tan** = a mule load.
- in Kunama-speaking areas: **doga** = a load.
- in Tegré-speaking areas: **gorät** = a load.
- in Tigrinya-speaking areas: **še‘enät** and **šekemi** = the amount carried on human shoulders; **gäbäta** = a donkey load; **ahit** = a mule load; and **enetälam** = a mountain camel load.

The Geez term **qoros**, according to [PANK4], the only reported multiple of a load, was conceived as the equivalent of 12 loads.

Products like cotton, tobacco and butter were sold by placing the commodity in the scale against an amolé (a salt bar), and asking for so many times its weight in amoles according to the market price, e.g., during the nineteenth century, it was reported that 640, 750 and 860 g of cotton and 54–60 kg of cereals were worth an amolé. The kuara (seed from the carob tree) served in the same way as a weight for medicine, and sometimes for gold. Smaller coins, such as gerš and mähäleqs, were usually used for weighing silk, gold and other precious metals.

Hebrew/Arabian-linked system, mainly based on [LUDO]

				Metric
mäkelit				15.54 kg
12	leter			1.29 kg
60	5	menan		259 g
6000	500	100	derham	2.59 g

Hebrew/Arabian-linked system, mainly based on Alāqa Kidanā Wäld Kiflé, according to [PANK4]

				Metric
mäkelit				15.55 kg
60	menan			259 g
300	5	säqel		5.18 g
600	10	2	derham	2.59 g
6000	100	20	10	géra 259 mg

Hebrew/Arabian-linked system, mainly based on Alāqa Tayā, according to [PANK4]

				Metric
mäkelit				12.44 kg
12	menan			103.68 g
480	40	derham		2.59 g

Upper scale during the early nineteenth century

						Metric
scittal di rame or cutal di antimonio						46.655 244 kg
$1\frac{1}{14}$	scittal					43.544 895 kg
$1\frac{1}{2}$	$1\frac{2}{5}$	cantar				31.103 496 kg
$3\frac{2}{43}$	$3\frac{11}{43}$	$2\frac{14}{43}$	uchile di avorio			13.374 503 kg
7	$6\frac{8}{15}$	$4\frac{2}{3}$	$2\frac{1}{150}$	farrasil di rame		6.665 037 kg
$7\frac{1}{2}$	7	5	$2\frac{3}{20}$	$1\frac{1}{14}$	farrasil	6.220 699 kg

Lower scale during the early nineteenth century

					Metric
farrasil					6.220 699 kg
20	rottolo, liter, or rottel^a				311.035 g
200	10	moca			31.103 g
240	12	$1\frac{1}{5}$	wakea, vachih, or wakihi		25.919 g
2400	120	12	10	derham	2.592 g

^a[KELL] reported it as about 312.001 g and [WAGN2] as 311.033 3 g

Upper scale (two reported scales) during the late nineteenth century

					Metric	Metric
farasula^a					18.035 7 kg	17.971 2 kg
$1\frac{1}{15}$	farasula^b				16.908 5 kg	16.848 kg
$1\frac{1}{3}$	$1\frac{1}{4}$	farasula^c			13.526 8 kg	13.478 4 kg
$534\frac{30}{35}$	$501\frac{3}{7}$	$40\frac{4}{35}$	neter		337.206 g	336 g
576	540	432	$10\frac{10}{13}$	wogiet	31.312 g	31.2 g

^aFor rubber

^bFor coffee

^cFor ivory

Lower scale (two reported scales) during the late nineteenth century

						Metric	Metric
moca						37.574 g	31.08 g
$1\frac{1}{5}$	wogiet or ukiya					31.312 g	25.90 g
$2\frac{2}{5}$	2	alada or adala				15.656 g	12.95 g
$4\frac{4}{5}$	4	2	mutagalla or mustagallu			7.828 g	6.47 g
$9\frac{3}{5}$	8	4	2	kasm		3.914 g	3.24 g
12	10	5	$2\frac{1}{2}$	$1\frac{1}{4}$	derham	3.131 g	2.59 g

During the nineteenth century

						Metric	Metric
dirrib						240–300 kg	187.6 L
1⅓	chán or tán					180–225 kg	140.7 L
2	1½	dawilla				120–150 kg	93.8 L
10⅔–13⅓	8–10	5⅓–6⅔	gebeta			18–28 kg	14.1–17.6 L
40	30	20	3 – 3¼	kúnna		6 – 7½ kg	4.7 L
240	180	120	18 – 22½	6	tása	1 – 1¼ kg	0.78 L

Other measures reported during the nineteenth century:

1 **aqmada** (for grains) = 50–60 kg;

1 **madigga** (in Gonder) = 16 **kúnna** = 96–120 kg;

1 **madigga** = 3, 8, or 10 **kúnna**.

British Imperial-linked system

		Metric
farasula		17.009 7 kg
37½	nater or neter	453.592 g

Metric-linked system for grain after 1963

				Metric
dawilla^a				100 kg
1¼	dwala			80 kg
2½	2	ladan or laden^b		40 kg
25	20	10	qounna or qunna^c	4 kg

^aAccording to *Negarit Gazeta*, dated August 31, 1963, proclamation 28

^bAlso reported as 30 kg

^cA woven basket in the shape of a bowl. Also reported as 5 kg, in *Negarit Gazeta*, dated August 31, 1963, proclamation 28

Metric system after 1967

							Metric
kilogeram							1 kg
10	héktogeram						100 g
100	10	dékageram					10 g
1000	100	10	geram				1 g
10,000	1000	100	10	désigeram			100 mg
100,000	10,000	1000	100	10	sentigeram		10 mg
1,000,000	100,000	10,000	1000	100	10	miligeram	1 mg

32 Etruria

See also *Tuscany* (sub-heading of *Italy*).

The Kingdom of Etruria was a short-lived puppet state comprising the largest part of

Tuscany. It was created by the Treaty of Aranjuez in 1801 and dissolved by Napoleon in 1807, when it was integrated into France. In 1814, the area was restored to the House of Habsburg.

33 Europa Island

A French Overseas Department and Territory since 1897, settled in the Mozambique Channel. The island is also claimed by Madagascar.

34 Ezo

See also *Japan*.

The Republic of Ezo declared its independence from Japan in early 1869, but the island was reincorporated into Japan in mid-1869, and later renamed Hokkaidō.

35 Falkland Islands

These islands were discovered by British navigator John Davys in 1592. In 1764, the French navigator Louis De Bougainville established the first settlement, at Port Louis. Spain later forced the British and French to abandon their settlements, but did not implement its claim to the islands. In 1829, the Republic of Buenos Aires sent Louis Vernet to develop a colony on the islands. It is now a self-governing Overseas Territory of the United Kingdom.

35.1 Currency

- 1971–: 1 Falkland Island pound (= 1 pound sterling) = 100 pence
- 1971: 1 Falkland Island pound (= 1 pound sterling) = 20 shillings = 240 pence

The dynastic union between the Faeroe Islands and Denmark was established in 1380, although the Faeroe Islands were considered a Norwegian sideland. Transfer to Denmark took place gradually. The Faeroe Islands became an autonomous province of Denmark in 1948. The islands were occupied and administered by Britain between 1940 and 1945.

The early systems of measurement on the Faeroe Islands were influenced by the Norse settlers from Ireland, Scotland, and Scandinavia. As the trading was intensified with the British Islands during the seventeenth to eighteenth centuries, several English measures came to be used. The metric system has been official since 1908.

Main sources: [DALG], [DALS], [DANI], [LOCK], [SYBE], and [WEST]

36.1 Currency

- 1949–: 1 Faroese króna (= 1 Danish krone) = 100 oyru
- 1940–1949: 1 Faroese króna (= 1/22.4 pound sterling) = 100 oyru
- 1874–1940: 1 Danish krone = 100 øre
- 1854–1874: 1 daler rigsmont = 96 skilling rigsmont
- 1813–1854: 1 rigsnakdaler = 96 rigsbank skilling courant
- 1713–1813: 1 rigsdaler courant = 96 skilling courant = 6 mark
1 rigsdaler species = 120 skilling courant

36.2 Units of Quantity

gross		144
12	dusin or tylvt	12

36 Faeroe Islands

See also *Denmark*.

For writing paper and printing paper

				Sheets						Sheets	
balla				4800		balla				5000	
10	rís			480		10	rís			500	
200	20	bók skrivipappíri		24		200	20	bók prentpappíri		25	
4800	480	24	ørk	1		5000	500	25	ørk	1	

Other measures reported during the nineteenth century:

1 **pakke** (for vaðmál (= wadmal)) = 60 alen;

1 **kippe** (for sheepskins) = 40;

1 **vørða** = 5 lundar;

1 **álkutyssi** = 3 álkur;

1 **kneppa** = 2 lomvigar.

36.3 Units of Length

Traditional system

											Metric
stykki											132.71 m
	manshædd										2.580 5 m
60	1 $\frac{1}{2}$	favnur									2.211 8 m
180	3 $\frac{1}{2}$	3	alin								737.28 mm
360	7	6	2	fótur							368.64 mm
1440	28	24	8	4	løgð						92.16 mm
3600	70	60	20	10	2 $\frac{1}{2}$	tummi					36.86 mm
5760	112	96	32	16	4	1 $\frac{1}{2}$	finger				23.04 mm
23,040	448	384	128	64	16	6 $\frac{1}{2}$	4	byggkorn			5.76 mm
92,160	1792	1536	512	256	64	25 $\frac{1}{2}$	16	4	strábreidd		1.44 mm
1,474,560	28,672	24,576	8192	4096	1024	409 $\frac{1}{2}$	256	64	16	hárbreidd	0.09 mm

Danish-linked system

											Metric
míl											7532 m
66 $\frac{2}{3}$	stykki										112.98 m
4000	60	favnur									1.883 m
12,000	180	3	alin								627.67 mm
24,000	360	6	2	fótur							313.83 mm
28,800	432	7 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	sponn						261.53 mm
48,000	720	12	4	2	1 $\frac{1}{3}$	korter					156.92 mm
288,000	4320	72	24	12	10	6	tummi				26.15 mm
3,456,000	51,840	864	288	144	120	72	12	linja			2.179 mm
41,472,000	622,080	10,368	3456	1728	1440	864	144	12	skrupla		182 μ m

Some units for maritime use:

1 **fjórðingur** or **sjómíl** = 1852 m.

Metric system

							Metric
kilometur							1000 m
10	hektometur						100 m
100	10	dekametur					10 m
1000	100	10	metur				1 m
10,000	1000	100	10	desimetur			100 mm
100,000	10,000	1000	100	10	sentimetur		10 mm
1,000,000	100,000	10,000	1000	100	10	millimetur	1 mm

36.4 Units of Area

Traditional system

					Metric
mørk^a					~5000 m ²
2	hálmørk				~2500 m ²
16	8	gyllin			~310 m ²
320	160	20	skinn		~15.5 m ²

^aVaried in area by location. The values above are a rough average

Other measures reported during the seven-
teenth to nineteenth centuries:

1 **pack** (for homespun cloth) = about 200 English
sq ft = 18.58 m².

Metric-linked system

						Metric
kúfóður						12,000 m ²
1½	hektar					10,000 m ²
17½	14¾	sátulendi				700 m ²
34¾	28¾	2	tunnulendi			350 m ²
120	100	7	3½	ar		100 m ²
12,000	10,000	700	350	100	fermetur	1 m ³

36.5 Units of Volume

Metric system

					Metric
rúmmetur					1 m ³
1000	rúmdesimetur				1 dm ³
1,000,000	1000	rúmsentimetur			1 cm ³
1,000,000,000	1,000,000	1000	rúmmillimetur		1 mm ³

36.6 Units of Dry Capacity

Some measures reported during the seventeenth to nineteenth centuries:

- 1 **barrel** (for barley, flour, malt, oatmeal, french salt, and coarse salt) = about 4 English bushels = 145.47 L;
- 1 **tun** (for butter and tallow) = 26 English gallons = 118.2 L.

Danish-linked system for flour and cereals

					Metric
tunna					138.96 L
8	skeppa				17.37 L
48	6	kannubari			2.895 L
144	18	3	pottur		965 mL
576	72	12	4	pegil	241.25 mL

Metric-linked system

						Metric
hektolitur						100 L
100	litur or pottur					1 L
200	2	hálvur litur				500 mL
400	4	2	kvart litur or pegil			250 mL
1000	10	5	2½	desilitur		100 mL
100,000	1000	500	250	100	millilitur	1 mL

36.7 Units of Liquid Capacity

Some measures reported during the seventeenth to nineteenth centuries:

- 1 **tun** (for beer, vinegar, and train-oil) = about 26 English gallons = about 118.2 L;
- 1 **kande** (for spirits and wine) = about 26 English pints = 14.77 L.

Metric-linked system

						Metric
hektolitur						100 L
100	litur or pottur					1 L
200	2	hálvur litur				500 mL
400	4	2	kvart litur or pegil			250 mL
1000	10	5	2½	desilitur		100 mL
100,000	1000	500	250	100	millilitur	1 mL

36.8 Units of Weight

Some measures reported during the seventeenth to nineteenth centuries:

- 1 **vog** (for butter, train-oil, tallow, belly-feathers, fish, and wool) = 40 English lbs = 18.14 kg;
- 1 **vaðsteinur** = the sinker that was bound to the handline when fishing.

English linked system

				Metric
skippund				160.277 kg
8 $\frac{1}{2}$	vág or vog ^a			18.144 kg
26 $\frac{2}{3}$	3	bismarapund		6.048 kg
320	36	12	skálpund	503.99 g

^aFor butter, train-oil, tallow, belly-feathers, fish, and wool, = 40 lbs

Danish-linked system

												Metric
skippund ^a												161.144 kg
2%	skinn ^b											72.065 kg
3⅓	1 ¹¹ / ₂₅	centnari										50.045 kg
8%	4	2%	vág									18.016 kg
20	9	6¼	2½	lispund								8.007 kg
26⅔	12	8⅓	3	1⅓	bismarapund							6.005 kg
160	72	50	18	8	6	tvípund						1.001 kg
320	144	100	36	16	12	2	skálpund					500.45 g
640	288	200	72	32	24	4	2	mørk				250.22 g
1280	576	400	144	64	48	8	4	2	hálmørk			125.11 g
26,666⅔	4800	3 333⅓	3000	1 333⅓	400	66⅔	33⅓	16⅔	8½	lodd ^c		15.01 g
80,000	14,400	10,000	9000	4000	1200	200	100	50	25	3	kvint	5.004 g

^aUsually used for fish

^bFor tallow = 4 kg, for nails = 25 kg and for whale meat = 50 kg

^cAlso reported as 20 g

Metric-linked system

						Metric
ton						1000 kg
1000	kilo					1 kg
2000	2	pund				500 g
4000	4	2	hálv pund			250 g
8000	8	4	2	fjerðingpund		125 g
1,000,000	1000	500	250	125	gramm	1 g

For wool

			Metric
pund			500 g
2	mørk		250 g
32	16	lodd	15.625 g

37 Fezzan

See *Libya*.

The metric system has been official since 1972.
Main sources: [ARBE] and [GRAH4]

38.1 Currency

1969–:	1 Fijian dollar = 100 cents
1917–1969:	1 Fijian pound = 20 shillings = 240 pence
1874–1917:	1 pound sterling = 20 shillings = 240 pence
c.1872–1874:	1 US dollar = 100 cents
–c.1872:	1 tambua = a whale tooth. There was traditionally a hierarchy of values for things, with the whale tooth at the top.

38 Fiji

These islands, no fewer than 322 in number, were discovered by the Dutch navigator Abel Tasman in 1643, and visited by Captain James Cook in 1774. The first European settlement was established in 1804. King Cakobau ceded the islands to Britain in 1874, when it became a British Crown Colony. Fiji gained its independence as a member of the British Commonwealth of Nations in late 1970.

38.2 Units of Length

British Imperial-linked system

			Metric
maile			1609.344 m
1736	liga ^a		914.392 mm
5208	3	yava ^b	304.797 mm

^aArm

^bFoot

38.3 Units of Area

1 **bigha** or **acre** = 4046.9 m².

38.4 Units of Dry Capacity

Some reported measures:

1 **kato** = a basket for various dry commodities;

1 **tānoa** = a wooden bowl of no specific size.

38.5 Units of Liquid Capacity

British Imperial-linked system since the late nineteenth century

							Metric
gallon							4.546 L
4	quart						1.136 5 L
8	2	pint					568.25 mL
160	40	20	fluid ounce				28.41 mL
320	80	40	2	tablespoon			14.21 mL
1280	320	160	8	4	teaspoon		3.55 mL
89,600	22,400	11,200	560	280	70	drop	0.05 mL

38.6 Units of Weight

1 **case** (for bananas during the twentieth century)
= 72 Imp lbs = about 32.7 kg.

39 Finland

See also *Russia* and *Sweden*.

This country came to owe allegiance to Sweden beginning at the end of the ninth century, and were governed by a Swedish Duke until 1561. It then had a Governor, and, from the seventeenth century, a Governor-General. In 1809, Sweden was conquered by Alexander I of Russia, and the peace terms gave Finland to Russia as a Grand Duchy. Shortly after the Bolshevik revolution, Finland declared its independence in 1917. In 1940, after the Winter War, most of the Petsamo area was ceded to the Soviets. The rest of the Petsamo area, except for Jäniskoski and Niskakoski, which Finland sold to the Soviets in 1947, was ceded to the Soviets after the Continuation War in 1944.

Throughout history, Finland has used a wide range of measurement systems. During ancient times, approximate units of measurement were based on the use of parts of the body and natural surroundings. During the Middle Ages, measurment systems were standardized for the purpose of commerce, but still varied by locality. For example, the units used in Porvoo were usually larger than those used in other towns and districts. From this fact arose the proverb *mitata Porvoon mitalla* (to measure in Porvoo units), which means to measure generously. In 1665, the units of measurement were standardized by law. Finland also adopted both Swedish and later Russian systems of measurement. During the 1800s, both of these were used in parallel for a long time. From 1734, the law required that the same sizes of units were used universally in the Kingdom of Sweden. In 1861, some traditional units were linked to the metric system. Finland

fully converted to the metric scale in 1880. The metric system has been legally optional since 1887, and compulsory since 1892.

Main sources: [BIAU], [GRÖN], [JUTI], [MELA3], [MOBE], [RAVI], and [UN55]

39.1 Currency

1999–: 1 euro = 100 euro-cent
1860–2002: 1 Finnish markka = 100 penniä
1809–1865: 1 rupla (Russian ruble) = 100 kopeekkaa (kopeks)

39.2 Units of Quantity

1 **tonni** = 1000;
1 **rynkie** (for lavarets at Satakunta during the sixteenth century) = 300;
1 **riisi** = 144 paper sheets;
1 **krossi** (for pencils during the sixteenth to twentieth centuries) = 12 tusinaa = 144;
1 **kiihtelys** (during the sixteenth to twentieth centuries) = 40 squirrel pelts;
1 **kerpo** or **kerppu** (during the sixteenth to twentieth centuries) = 31 lampreys (30 in a bunch and one for tying);
1 **buntta** = 20 matchboxes;
1 **tiu** = 20 eggs;
1 **tusina** = 1/12 krossi = 12;
1 **toltti** = 12 (for lumber);
1 **tikkuri** (for skins and furs during the sixteenth to twentieth centuries) = 10;
1 **fierdungh** (for Baltic herring at Hantula, Jokala, and Muola during the mid-sixteenth century) = 4;
1 **trio** = 3;
1 **tupla** or **pari** = 2.

For typing paper

				Metric
pakka				5000 sheets
10	riisa			500 sheets
200	20	kirja		25 sheets
5000	500	25	arkkia	1 sheet

39.3 Units of Length

Traditional units used long before standardization:

- 1 **päivämatka** = the distance of one day's travel;
- 1 **poronkusema** = the distance between the reindeer's need to urinate = ~ 7.5 km;
- 1 **peninkulma** = the distance at which a barking dog can be heard in still air;
- 1 **kivenheitto** = the distance a stone could be thrown = ~ 100 kyynära = ~ 50 m;
- 1 **vakomitta** = the furrow's length on field;

1 **syli** = the distance between the fingertips of both hands when the arms are raised horizontally to the sides;

1 **askel** = roughly a step for an adult male;

1 **vaaksa** = the distance between the tips of the little finger and thumb, when the fingers are fully extended = ~ 210 mm.

1 **kyynära** = the distance from the elbow to the fingertips;

1 **jalka** = the length of a human foot;

1 **kämmenen leveyttä** = the width of the palm;

1 **tuuma** = the width of a thumb;

1 **linja** = the width of a barleycorn.

Approximate scale used before 1600

						Metric
päivämatka						~20 km
~2 $\frac{2}{3}$	poronkusema					~7.5 km
–	–	Suomen peninkulma				~5.5 km
–	–	5	virsta			~1.1 km
400	150	110	22	kivenheitto		~50 m
40,000	15,000	11,000	2200	100	kyynära	~500 mm

Traditional upper scale after 1600

					Metric
päivämatka					~22 km
2	Ruotsin peninkulma				~11 km
20	10	virsta			~1.1 km
72,000	36,000	3600	jalka		~305 mm

Upper scale used from 1665 until 1880

					Metric
päivämatka					21,376.8 m
2	(ussi = new) peninkulma				10,688.4 m
4	2	(vanha = old) peninkulma			5344.2 m
72,000	36,000	18,000	jalka		296.90 mm

Lower scale used from 1665 until 1880

										Metric
Suomen virsta^a										1068.84 m
5	vakomitta									213.768 m
600	120	syli								1.781 4 m
1800	360	3	kyynära							593.80 mm
3600	720	6	2	jalka						296.90 mm
7200	1440	12	4	2	kortteli					148.45 mm
36,000	7200	60	20	10	5	tuuma kymmenysmittana				29.69 mm
43,200	8640	72	24	12	6	1 $\frac{1}{2}$	vanha tuuma^b			24.741 7 mm
518,400	103,680	864	288	144	72	14%	12	linja		2.061 8 mm

^a[MART3] reported it as equal to 10,667.904 240 m in Helsinki

^bAlso called 1 **peukaloa**

Swedish scale in Helsinki before 1880, based on [MART3]

				Metric
famn				1.781 436 m
3	aln			593.812 mm
6	2	fot		296.906 mm
144	24	12	verktum	24.742 mm

Swedish scale, based on the Stockholm aln or Rydaholms aln

								Metric
tanko								2.968 92 m
1 $\frac{2}{3}$	syli							1.781 35 m
5	3	kyynära or aln						593.78 mm
10	6	2	jalka or fot					296.892 mm
20	12	4	2	kortteli or kvarter				148.446 mm
100	60	20	10	5	kymmenystuuma			29.689 mm
120	72	24	12	6	1 $\frac{1}{5}$	tuuma työmittana or verktum		24.741 mm
1440	864	288	144	72	14 $\frac{2}{5}$	12	linja	2.061 7 mm

There was also 1 **ruotsin virsta** = 2500 syliä = 2672.025 m. 1 **pnolituuma** (half thumb) = $\frac{1}{2}$ verktum = 12.37 mm.

Russian scale, based on the arsina

								Metric
venäjän virsta								1066.80 m
500	venäjän syli or sazhen							2.133 6 m
1500	3	venäjän kyynärä or arsina						711.2 mm
3500	7	2 $\frac{2}{3}$	jalka					304.8 mm
6000	12	4	1 $\frac{1}{7}$	setvertti or tshetvert				177.8 mm
24,000	48	16	6 $\frac{6}{7}$	4	versokka			44.45 mm
42,000	84	28	12	7	1 $\frac{3}{4}$	tuuma^a or englannin tuuma		25.4 mm
420,000	840	280	120	70	17 $\frac{1}{2}$	10	englantilainen linja	2.54 mm

^aStill used for measuring lumber

Maritime scale

					Metric
meripeninkulma^a					1852 m
10	kaapelinmitta				185.2 m
60	6	merisekunti			30.867 m
1000	100	16 $\frac{2}{3}$	syli		1.852 m
3600	360	4 $\frac{17}{27}$	3 $\frac{3}{5}$	meritertia	514.44 mm

^aOne angular minute at the equator. 1 **solmu** = 1 meripeninkulma per hour, was used as a speed unit at sea

Denary scale for Swedish units with the tanko as the base unit

				Metric
tanko				2.969 m
10	jalka			296.9 mm
100	10	tuuma		29.69 mm
1000	100	10	linja	2.969 mm

Metric-linked system used from 1861 until 1880

						Metric
peninkulma						10,000 m
10	virsta					1000 m
100	10	vakomitta				100 m
20,000	2000	200	metrinen kyynärä			500 mm
66, 666⅔	6 666⅔	666⅔	3⅓	metrinen vaaksa		150 mm
400,000	40,000	4000	20	6	metrinen tuuma	25 mm

Metric-linked system, proposed in 1864 in [MOBE], but never used

								Metric
peninkulma								10,000 m
10	virsta							1000 m
100	10	vakomitta						100 m
1000	100	10	rehto					10 m
10,000	1000	100	10	sauva				1 m
100,000	10,000	1000	100	10	palma			100 mm
1,000,000	100,000	10,000	1000	100	10	poli		10 mm
10,000,000	1,000,000	100,000	10,000	1000	100	10	riipu	1 mm

For sawn wood since the early nineteenth century

		Metric
jalka		304.8 mm
12	tuuma	25.4 mm

Other measures reported during the nineteenth to twentieth centuries:

- 1 **valovuosi** (light year) = during the late twentieth century, colloquially used to describe that something is extremely distant;
- 1 **kivenheitto** = colloquially used to describe something quite near.

39.4 Units of Area

Land areas were determined either in the field area, depending on how much grain one was able

to sow or on what the land yielded in taxes. Traditional units for land areas were not connected to the mathematical square of any length dimension. During the fifteenth to sixteenth centuries, the peasantry divided the land surrounding each village between the households. Each allotment, called a *teg*, had the same width. The tool for measuring the width was a rod, called a *stång*, whose length varied from one village to another, and even in the same village at different times. The length was not measured, but the large number of allotments somewhat equalized these differences. Hence, most homesteads in a village had almost the same land area per *öresland*. In cases in which the land area consisted of agricultural land made cultivatable by slash-and-burn, as much as three quarters was covered with rocks, stumps and burnt trees. Then, one instead

had to estimate the size of the land based on the yield. A field area was then expressed as a measure of capacity for grain, e.g., a *karpland*, whereby the relationship between the different areas was equal to the relationship between the corresponding units of capacity. There were also some other area measures in use, such as the *oravaisland* (“squirrel land”).

pundland				
6	spannland			
10	1 $\frac{1}{2}$	karpland		
18	3	1 $\frac{1}{5}$	kylmitland	
48	8	4 $\frac{1}{5}$	2 $\frac{2}{3}$	oravaisland

1 **spannland** = the area of land that could be sown with one span of grain or 3/4 span of rye.

Upper scale, based on a 1633 reported value for one äyrinmaa = 11,777 neliökyynärä

				Metric
penninginmaa^a				173,037.5 m ²
41 $\frac{2}{3}$	äyrinmaa^b			4152.9 m ²
125	3	äyrityisenmaa^c		1384.3 m ²
490m790	11m777	3m926	neliökyynärä	0.352 598 m ²

^a1 **penninginmaa** = the area in which grain worth one *penninki* in taxation is grown

^b1 **äyrinmaa** = the area in which grain worth one *äyri* in taxation is grown

^c1 **äyrityisenmaa** = the area in which grain worth one *äyrityinen* taxation is grown

Lower scale from 1635 until 1848

								Metric
tynnyrinala ^a								4936.38 m ²
2	panninala ^b							2468.19 m ²
8	4	vakanala						617.046 m ²
32	16	4	(vanha = old) kapanala ^c					154.262 m ²
56	28	7	1¾	kannunala ^d				88.149 m ²
1 555%	777%	194%	48 ¹¹ / ₁₈	27%	neliösyli			3.173 m ²
14,000	7000	1750	437½	250	9	neliökyynärä		0.352 598 m ²
56,000	28,000	7000	1 866⅔	1000	36	4	neliöjalka	8.814 95 dm ²

^a1 **tynnyrinala** = the area that could be sown with one barrel of grain. During the sixteenth century, said to equal 4620 m². [MART3] reported it as 4936.577 7 m²

^b1 **panninala** = the area that could be sown with one panni of grain. [MART3] reported it as 2468.288 8 m²

^c1 **kapanala** = the area that could be sown with one bushel of grain. [MART3] reported it as 154.268 1 m²

^d1 **kannunala** = the area that could be sown with one kannu of grain. [MART3] reported it as 88.153 173 m²

After 1848

						Metric
tynnyrinala						4936.38 m ²
2	panninala					2468.19 m ²
30	15	(ussi = new) kapanala				164.546 m ²
56	28	1 $\frac{13}{15}$	kannunala			88.15 m ²
14,000	7000	466 $\frac{2}{3}$	250	neliökyynärä		0.352 598 m ²
56,000	28,000	1 866 $\frac{2}{3}$	1000	4	neliöjalka	8.814 95 dm ²

Some Swedish units were used to some extent until the mid-nineteenth century, e.g., 1 **tunnland** = 4654 m².

Metric-linked system, proposed in 1864 in [MOBE], but never used

			Metric
vakomitan-ala			10,000 m ²
100	rehdon-ala		100 m ²
10,000	100	sauvan-ala	1 m ²

Metric scale used after 1880

					Metric
neliökilometriä					1,000,000 m ²
100	hehtaari				10,000 m ²
200	2	tynnyrinala			5000 m ²
10,000	100	50	aari		100 m ²
1,000,000	10,000	5000	100	neliömetriä	1 m ²

39.5 Units of Volume

Some reported measures:

- 1 **kapplass**, **capplass** or **kapperlass** (for hay during the sixteenth century) = 6 åmar;
- 1 **famn** or **famp** (for hay in Åland during the sixteenth century) = 1/6 lass (= a loaded cart of hay);
- 1 **famn** (for wood at Raseborg during the mid-sixteenth century) = 5 × 5 × 3 alnar = 15.7 m³;
- 1 **syli** (for fuel wood, 2 × 2 × 1 m) = 4 m³;
- 1 **standartti** (for sawn wood) = 4.672 m³;
- 1 **motti** (for firewood or waste paper) = 1 m³.

39.6 Units of Dry Capacity

For cereals in Finland Proper and Satakunta

					Metric
puntalästi					6840 L
12	punta				570 L
72	6	panni			95 L
288	24	4	panninelikko		23.75 L
1440	120	20	5	kappe	4.75 L

For cereals in Häme

				Metric
puntalästi				7908 L
12	punta			659 L
72	5	panni		131.8 L
1728	120	24	vakka	5.49 L

For cereals in Karelia

					Metric
puntalästi					6840 L
12	punta				570 L
72	6	panni			95 L
216	18	3	kylmit		31.7 L
1296	108	18	6	vakka	5.27 L

For cereals in Ostrobothnia

						Metric
puntalästi						7032 L
12	punta					586 L
96	8	panni				73.25 L
384	32	4	panninelikko			18.31 L
960	80	10	2½	vakka		7.325 L
1536	128	16	4	1⅓	kappa	4.578 L

1 tynnyri = 8 vakkaa = 58.6 L (in Karainen), and = 4 vakkaa = 29.3 L (in Korsholm).

For cereals in Raseborg

				Metric
puntalästi				6624 L
12	punta			552 L
72	6	panni		95 L
1440	120	20	vakka	4.75 L

For cereals in Savonia

							Metric
puntalästi							7251.55 L
12	punta						604.30 L
72	6	panni					100.72 L
144	12	2	karp				50.36 L
288	24	4	2	panninelikko			25.18 L
432	36	6	3	1½	kolma		16.79 L
1584	132	22	11	5½	3⅔	kappa	4.578 L

For cereals at Nyslott in South Savonia

		Metric
Tukholman skäppa		98.3 L
22	Tukholman kappe	4.468 L

For cereals in Tavastia Proper

						Metric
puntalästi						4752 L
12	punta					396 L
60	5	panni				79.2 L
120	10	2	karp			39.6 L
240	20	4	2	panninelikko		19.8 L
1440	120	24	12	6	vakka	3.3 L

For cereals in Uusimaa

puntalästi					
12	punta				
72	6	panni			
144	12	2	panninelikko		
1440	120	20	10	vakka	

For cereals on the Åland Islands

puntalästi				
12	punta			
96	8	panni		
192	16	2	panninelikko	
1920	160	20	10	fat

Some measures reported during the sixteenth to eighteenth centuries:

- 1 **karp** (for ginger bread from Åbo during the sixteenth century) = ?;
- 1 **kahmalo** = two handfuls;
- 1 **panni** or **spann** (for cereals, flaxseed, and peas during the sixteenth to eighteenth centuries) = ~ 80 L;

Swedish scale used for grain before 1638 (Stockholm Castle scale), after 1638 and after 1665

							Metric	Metric	Metric
lästi									7034.88 L
48	tyunnyri^a						~94 L	~143.04 L	146.56 L
64	1 $\frac{1}{3}$	nelikko							109.92 L
96	2	1 $\frac{1}{2}$	panni				~47 L	~71.5 L	73.28 L
192	4	3	2	puoli panni				~35.8 L	36.63 L
384	8	6	4	2	neljannes or kielo				18.32 L
1536	32	24	16	8	4	kappa^b or stockholmskappe		~4.47 L	4.58 L
2688	56	42	28	14	7	1 $\frac{3}{4}$	kannu		2.617 L

^a[MART3] reported 1 tyunnyri as 36 kappar = 164.891 198 L

^b[MART3] reported 1 kappa = 4.580 311 L

39.7 Units of Liquid Capacity

Suuret vetomitat (= big dimensions), for beer and wine

								Metric
tynnnyri								942.192 L
2	puoli tynnyri							471.096 L
4	2	neljänneksellä tynnyri						235.548 L
6	3	1½	aami					157.032 L
12	6	3	2	puoli aami				78.516 L
24	12	6	4	2	ankkuri			39.258 L
48	24	12	8	4	2	puoli ankkuri		19.629 L
360	180	90	60	30	15	7½	kannu	2.617 2 L

Swedish scale in Helsinki, based on [MART3]

								Metric
foder								942.223 542 L
2	pipa							471.111 771 L
4	2	oxhufvud						235.555 885 L
6	3	1½	am or fat					154.039 236 L
24	12	6	4	ankare				39.259 809 L
360	180	90	60	15	kanna			2.617 321 L

Tynnyri-scale (small-dimensions) for salted fish and whale oil

								Metric
tynnyrilästi								1507.507 2 L
12	tynnyri							125.625 6 L
24	2	puoli tynnyri						62.812 8 L
48	4	2	neljänneksellä tynnyri					31.406 4 L
96	8	4	2	kahdeksas tynnyri				15.703 2 L
192	16	8	4	2	kuudestoista tynnyri			7.851 6 L
576	48	24	12	6	3	kannu		2.617 2 L

Swedish upper scale

								Metric
lästi^a								1507.4–1884.24 L
48–60	nelikko							31.404 L
96–120	2	ottingar or ottinger						15.702 L
192–240	4	2	sextingkar					7.851 L
288–360	6	3	1½	kappa or kappe				5.234 L
576–720	12	6	3	2	kannu^b			2.617 L

^aMainly used for tar

^bAmong Swedish-speaking Finns, also reported as **kaima**

Swedish lower scale

							Metric
kannu							2.617 L
2	tuoppi						1.308 5 L
4	2	puoli tuoppi or stop					654.25 mL
8	4	2	kortteli or kvarter				327.125 mL
16	8	4	2	puoli kortt			163.562 5 mL
32	16	8	4	2	jumpru		81.781 25 mL
100	50	25	12½	6¼	3⅞	kuutio- kymmenystuumaa	26.17 mL

Russian scale (often used for vodka)

							Metric
ämpäri or sanko							12.29 L
8	venäläinen tuoppi						1.536 L
10	1¼	kruzhko or (small) tuoppi					1.229 L
32	4	3⅝		kortteli			384.06 mL
100	12½	10		3⅞	tsharka ^a		129.9 mL
150¼						pikari	81.8 mL

^aThe size of the tsharka was reported as 143.5 mL during the late sixteenth century, but gradually reduced

During the late nineteenth century, it was reported as about 123 mL.

Scale reported during the mid nineteenth century

				Metric
tynnryri				164.889 L
30	kappa			5.496 3 L
52½	1¾	kannu		3.141 L
105	3½	2	stop	1.570 L

Scale reported during the late nineteenth century

				Metric
tunna				163.49 L
10½	ottingar			15.57 L
21	2	sextingar		7.785 L
63	6	3	kannu	2.595 L

Metric-linked system, proposed in 1864 in [MOBE], but never used

					Metric
parmas					1000 L
10	tynnneri				100 L
100	10	kantio			10 L
1000	100	10	pinno		1 L
10,000	1000	100	10	impi	100 mL

Metric-linked system

				Metric
tunna				150 L
30	kappa			5 L
60	2	kannu or pikkukappa		2.5 L
150	5	2½	litra	1 L

39.8 Units of Weight

During the Viking era (c. 700–950), a Swedish/ Islamic system was used in trading with Bandlunde, Birka and Hedeby. The system consisted of five units: ~12.70 g, ~6.35 g, ~3.17 g, ~1.59 g and ~0.80 g.

Russian-Scandinavian system

							Metric
funt							409.5 g
1½	Saxon pound						341.2 g
2	1%	mark					204.7 g
32	26%	16	lod				12.8 g
96	80	48	3	zolotnik			4.26 g
9216	7680	4608	288	96	dolya		44 mg

In 1665, a regulation stipulated that the entire kingdom had to be consistent in its dimensions and weights. In 1739, a weight regulation was imposed on refinements for the system of weights, which was valid until 1855. In the regulation of 1739, six kinds of weight system were mentioned: the weights for food, the weights for precious metals, monetary weights, special weights, weights for the pharmacy, and weights for metals.

Other measures:

1 **leiviskä** = 6.866 kg (1557 in Vyborg in present Russia);¹

1 **leiviskä** (during the seventeenth century) = 8.5 kg–10 kg;²

1 **kuparitalari** = 32 kupariaayiaa = 768 kuparipenninkiaa (reported in 1624);

1 **kippunta vuoripainoa** (lining weight) = 136 kg;

1 **kippunta takkirautapainoa** (pig iron weight) = 177 kg;

1 **dritteli** (for butter) = 51.5 kg;

1 **karaati** (for fine use) = 200 mg.

For food after 1739

						Metric
kippunta						170.030 4 kg
4	center or senter					42.507 6 kg
20	5	leiviskä				8.501 52 kg
400	100	20	naula			425.076 g
12,800	3200	640	32	luoti ^a		13.283 625 g
51,200	12,800	2560	128	4	kvintiini	3.320 906 g
3,539,200	884,800	176,960	8848	276½	69⅞ ass	48.042 043 mg

The weight system for food was derived from the early 1600s, when the locally fluctuating steelyard weights were introduced. Food weights were developed in Västergötland, where food was vital to tax payments. Local weights for food were used in Savonlinna beginning in 1570

^aThe weight of a musket ball

Russian scale

			Metric
berkovets			163.8 kg
10	puuta		16.38 kg
400	40	venäjän naula	409.5 g

¹ [SUOM].

² [KATA, p. 428].

Measures reported for cereals during the nineteenth century:

1 **kuli** (for rye flour) = 360 venäjän naulaa = 147.42 kg;

1 **kuli** (for cereals and rice) = 320 venäjän naulaa = 131.04 kg;

1 **kuli** (for barley) = 260 venäjän naulaa = 106.47 kg;

1 **kuli** (for oats) = 220 venäjän naulaa = 90.09 kg.

For mining from 1739 to 1863

			Metric
kippunta			149.626 8 kg
20	markkinaula		7.481 34 kg
400	20	markki	374.067 g

Several systems of weights for mining-products had been used since the seventeenth century in Falun, Kristinehamn and Örebro. Those systems eventually failed in use. The use of metal as a key tool in the tax payment system

made it necessary to develop a new system for metal weights in Sweden.

Heavy-duty metal weights

			Metric
kippunta			194.514 76 kg
20	markkinaula		9.725 738 kg
400	20	markki	486.286 9 g

A special feature of this weight system was the fact that the weight was allowed to be off by one percent of the agreed-upon value, for example, because of transportation costs.

Tapulikaupunkipainot (in Swedish: *Stapelstadsvikt*, used by cities that had been allowed to conduct importing and exporting), introduced in 1605

			Metric
kippunta			136.024 32 kg
20	markkinaula		6.801 216 kg
400	20	markki	340.060 8 g

Maakaupunkipainot (in Swedish: *Uppstadsvikt*, a system used by cities that could only engage in domestic trade and navigation)

			Metric
kippunta			142.825 6 kg
20	markkinaula		7.141 28 kg
400	20	markki	357.064 g

Monetary weights until 1830

					Metric
luotimarkka					210.616 2 g
8	unssi				26.327 0 g
16	2	luoti			13.163 5 g
64	8	4	kvintiini		3.290 9 g
4384	548	274	68½	ass	48.04 mg

Until 1830, the weight of the Markka was 210.6 g, and between 1830 and 1873, it was 245.1 g.

During the Viking-era, it was about 203 g.

For gold and silver

				Metric
markka				212.535 g
8	unssi			26.567 g
16	2	luoti		13.283 4 g
64	8	4	kvintiini	3.320 9 g

Old upper scale used in ships for tonnage measurement

			Metric
iso lästi			24,480 kg
10	lästi painava or laivanlästi		2448 kg
180	18	kippunta vuoripainoa	136 kg

New upper scale used in ships for tonnage measurement

		Metric
uusi lästi		4250.2 kg
100	sentneri	42.502 kg

Other measures used in international trading during the twentieth century:

- 1 **wey** = 82.628 kg;
- 1 **sack** = 76.272 kg;
- 1 **box** = 40.860 kg;
- 1 **tub** = 38.136 kg;
- 1 **frail** (for dry fruit) = 22.7 kg;
- 1 **score** = 9.08 kg;
- 1 **head** = 3.064 5 kg.

Swedish scale for dry commodities

								Metric
kippunta								170.030 4 kg
4	sentneri							42.507 6 kg
20	5	leiviskä						8.501 52 kg
400	100	20	naula					425.076 g
800	200	40	2	markka				212.538 g
12,800	3200	640	32	16	luoti			13.283 625 g
51,200	12,800	2560	128	64	4	kintiini		3.320 906 g
3,539,200	884,800	176,960	8848	4424	276½	69⅞	ass	48.042 04 mg

Russian scale for dry commodities

				Metric
kuli ^a				147.42 kg
9	puuta			16.38 kg
360	40	naula		409.5 g
11,520	1280	32	luoti	12.8 g

^aAccording to [TIET]: 1 **kuli** = 220 naula (for oats) = 90.09 kg, 260 naula (for barley) = 106.47 kg, 300 naula (for rye flour) = 122.85 kg, 320 naula (for grits) = 131.04 kg and 360 naula (for rye) = 147.42 kg

After 1861

							Metric
kippunta							170.24 kg
4	sentneri						42.56 kg
20	5	leiviskä					8.512 kg
400	100	20	naula				425.6 g
800	200	40	2	markka			212.8 g
6400	1600	320	16	8	unssi		26.6 g
12,800	3200	640	32	16	2	luoti	13.3 g

Swedish-linked scale in Helsinki, based on [MART3]

							Metric
skeppund							170.030 320 kg
20	lispund						8.501 516 kg
400	20	skalpund or mark					425.076 g
12,800	640	32	lod				13.284 g
51,200	2560	128	4	qvintin			3.321 g
3,539,200	176,960	8848	276½	69⅞	ass		48.042 mg

Metric-linked system, proposed in 1864 in [MOBE], but never used

							Metric
lästi							1000 kg
100	punta						10 kg
1000	10	kilo					1 kg
10,000	100	10	lumpio				100 g
100,000	1000	100	10	luoti			10 g
1,000,000	10,000	1000	100	10	rammi		1 g

Metric-linked system

				Metric
senttaali				100 kg
10	metrinen leiviskä			10 kg
200	20	metrinen naula		500 g

For medical use until 1862

						Metric
libra medicinalis or apteekkinaula						356.227 g
12	unssi					29.685 6 g
24	2	luoti apteekkipainona				14.842 8 g
96	8	4	drakma			3.710 7 g
288	24	12	3	skruupeli or krupula		1.236 9 g
5760	480	240	60	20	graani	61.845 mg

There was also 1 **ass** = 48.042 04 mg and
1 **jyvä** = 42.5 mg.

Swedish-linked scale for medical use in Helsinki, based on [MART3]

						Metric
skalpund						357.664 000 g
12	uns					29.805 333 g
96	8	drachma				3.725 667 g
288	24	3	skrupel			1.241 889 g
5760	480	60	20	gran		62.094 mg

Decimalized scale for medical use, used from 1855 to 1870

						Metric
uusilästi						4 250.76 kg
100	sentneri					42.506 7 kg
10,000	100	naula				425.076 g
1,000,000	10,000	100	ortti			4.250 76 g
100,000,000	1,000,000	10,000	100	korn		42.506 7 mg

Swedish-linked scale for gold and silver in Helsinki, based on [MART3]

					Metric
mark^a					425.075 800 g
32	lod				13.283 619 g
128	4	qvintin			3.320 905 g
8848	276½	69⅞	ass		48.042 mg

^aAlso used as a monetary weight until 1877

Other reported measures:

1 **skeppläst** (in Helsinki, according to [MART3])
= 150 Russian pud = 2457.069 360 kg.

In 1719, this city (present-day Rijeka in Croatia) became a free port of the Holy Roman Empire. It was transferred to the Kingdom of Hungary in 1776, but gained the status of *Corpus separatum* three years later. Between 1848 and 1868, the city briefly lost its status after being occupied by Croatia. Fiume became an independent free state in 1920, but was annexed by the Kingdom of Italy in early 1924. After WWII, it officially became part of Yugoslavia in 1947. In 1991, after the Croatian War of Independence, the city became part of Croatia.

40.1 Currency

1994–: 1 Croatian kuna = 100 lipas

1991–1994: 1 Croatian dinar = 100 para

1945–1991: 1 Yugoslavian dinar = 100 para

40 Fiume

See also *Italy* and *Yugoslavia*.

- 1924–1945: 1 Italian lira = 100 centesimi
1919–1924: 1 Fiume krone
1892–1920: 1 Austrian krone = 100 heller
1878–1892: 1 Austrian gulden = 100 kreuzer

41 Formosa

See *Taiwan*.

42 Fouta Djallon

See also *Kaabu Empire* and *Mali*.

This kingdom was established in the Fouta Djallon highlands in present-day Ghana in 1725, and was defeated by the French in 1896.

Main sources: [DERM] and [LOVE]

42.1 Units of Quantity

1 **sari-ari** = 4000 kernels of maize.

42.2 Units of Dry Capacity

They used an indigenous system of measurement based on the **korung**, a small basket that held five or six bunches of taro (*Colocasia esculenta*) or manioc (*Manihot esculenta*). These baskets were also used for carrying various herbs, seeds and other dry commodities to the local market places.

42.3 Units of Weight

For rice and fonio

		Metric	Metric
debeere		~3000 kg	~2000 kg
2000	korung	~1.5 kg	~1 kg

These units were also used for salt, oddgi, nebang kari and hot peppers

43 France

See also *Europa Island*, *Mayotte*, and *Réunion*.

From the middle of the fifth century, there existed a number of Frankish Kingdoms. Under Charlemagne (742–814), the Frankish Empire consisted of a large part of Western Europe. This Empire was partitioned in the Treaty of Verdun of 843, between his grandsons, into East Francia, Middle Francia and West Francia. Western Francia approximated the area occupied by modern France. The Carolingian dynasty ruled France until 987, when Hugh Capet, Duke of France and Count of Paris, was crowned King of France. His descendants ruled France until 1792, when the French Revolution made the country a republic. Napoleon took control of the Republic in 1799. After the fall of Napoleon in 1815, the Bourbon monarchy was restored to France. This Kingdom lasted until 1848, when the Second Republic was established. This republic was succeeded by Louis-Napoleon Bonaparte, nephew of Napoleon I, who first was elected president, and then, in 1852, proclaimed the Second Empire. In 1870, the monarchy was finally abolished. The Third Republic lasted from 1870 to 1940. The Fourth Republic was consituted in 1946. In 1958, a major reform led to the establishment of the Fifth Republic.

Most often, each city maintained its own separate system of weights and measures. Many of the larger cities also maintained systems that served wider regional needs, and just a few systems were adopted by the King for national use. In 1791, the French National Assembly presented its first version of a national system of weights and measures. The metric system has been compulsory since 1794 and 1840.

Main sources: [ALTE], [CHAR2], [CHAR3], [CHAR4], [DOUR], and [ZUPK3]

43.1 Currency

- 1999–: 1 euro = 100 euro-cent
1795–2002: 1 French franc = 10 decimes = 100 centimes

1716–1795: 1 livre tournois = 20 sous =
240 deniers
1641–1715: 1 livre tournois = 20 sols =
240 deniers
1360–1641: 1 French franc

43.2 Units of Quantity

1 **grosse** = 12 douzaines = 144;
1 **haitaine** = 8.

43.3 Units of Length

Measures derived from the system of Charlemagne (768–814), who introduced “pied de roi” and the “livre esterlin,” which was based on the Arabian unit yusdroman

								Metric
lieue ancienne ^a								3265.950 m
45 $\frac{1}{11}$	arpent							71.850 900 m
454 $\frac{9}{11}$	10	perche d'arpent						7.185 090 m
555 $\frac{9}{11}$	12 $\frac{9}{11}$	1 $\frac{9}{11}$	perche-du-roi					5.878 710 m
1 666 $\frac{2}{3}$	36 $\frac{2}{3}$	3 $\frac{2}{3}$	3	toise				1.959 570 m
10,000	220	22	18	6	pied-du-roi			326.595 mm
120,000	2640	264	216	72	12	pouce		27.216 mm
1,440,000	31,680	3168	2592	864	144	12	ligne	2.268 mm

^aThere was also 1 **lieue Gauloise** = 2222.998 049 m

In Paris before 1668

						Metric
lieue française						4445.996 098 m
–	lieue de Paris					3920.631 480 m
2268	2000	toise				1.960 315 740 m
13,608	12,000	6	pied			326.719 290 mm
163,296	144,000	72	12	pouce		27.226 607 mm
1,959,552	1,728,000	864	144	12	ligne	2.268 884 mm

Other reported measures:

1 **aune** (for cloth from 1557 to 1668) = 1.188
895 m;
1 **aune** (for cloth from 1668 to 1746) = 1.182
054 m.

Legal system in Paris from 1668 to 1793

									Metric
poste^a									7796.146 365 6 m
2	lieue de poste^b								3898.073 182 8 m
4	2	mille de poste^c							1949.036 591 4 m
1 333⅓	666⅔	333⅓	perche or verge						5.847 109 774 2 m
4000	2000	1000	3	toise^d					1.949 036 591 4 m
24,000	12,000	6000	18	6	pied de roi				324.839 431 9 mm
288,000	144,000	72,000	216	72	12	pouce			27.069 952 6 mm
3,456,000	1,728,000	864,000	2592	864	144	12	ligne		2.255 829 4 mm
41,472,000	20,736,000	10,368,000	31,104	10,368	1728	144	12	point	187.985 8 µm

^aThere was also a **poste** = 4400 toises = 8575.761 001 m

^bThere was also a **lieue de poste** (for administrative use) = 2200 toises = 4,287.880 501 m. 1 **lieue moyenne** = 2500 toises = 4,872.591 478 m and 1 **lieue française de 25 au degré** = 2268 toises = 4420.414 991 m

^cThere was also a **mille de poste** (for administrative use) = 1100 toises = 2143.940 250 m

^dAt 16.25 °C (equivalent made legal in 1799) = 1.949 036 500 m, and (by measurement in 1887, by J. R. Benoit) = 1.949 090 m.

Metric decimal system from August 1, 1793 to April 7, 1795

					Metric
gradi					100,000 m
100	millaire				1000 m
100,000	1000	mètre			1 m
1,000,000	10,000	10	décimètre		100 mm
10,000,000	100,000	100	10	centimètre	10 mm

System introduced by decree on November 4, 1800

							Metric
lieue							10,000 m
10	mille						1000 m
1000	100	perche					10 m
10,000	1000	10	mètre				1 m
100,000	10,000	100	10	palme			100 mm
1,000,000	100,000	1000	100	10	doigt		10 mm
10,000,000	1,000,000	10,000	1000	100	10	trait	1 mm

Mesures usuelles for the retail industry introduced by decrees of February 12, 1812 and March 28, 1812, and used until 1839

					Metric
lieue usuelle					4,000.000 000 m
2000	toise usuelle				2.000 000 m
12,000	6	pied usuelle			333.333 mm
144,000	72	12	pouce usuelle		27.778 mm
1,728,000	864	144	12	ligne usuelle	2.315 mm

Mesures usuelles for cloth introduced by decrees of February 12, 1812 and March 28, 1812, and used until 1839

								Metric
aune usuelle								1.200 000 m
2	demi-aune							600.000 mm
3	1½	tiers aune						400.000 mm
4	2	1⅓	quarts aune					300.000 mm
6	3	2	1½	sixièmes aune				200.000 mm
8	4	2⅔	2	1⅓	huitièmes aune			150.000 mm
12	6	4	3	2	1½	douzièmes aune		100.000 mm
16	8	5⅓	4	2⅔	2	1⅓	seizièmes aune	75.000 mm

Metric system after January 1, 1840

								Metric
myriamètre								10,000 m
10	kilomètre							1000 m
100	10	hectomètre						100 m
1000	100	10	decamètre					10 m
10,000	1000	100	10	mètre				1 m
100,000	10,000	1000	100	10	décimètre			100 mm
1,000,000	100,000	10,000	1000	100	10	centimètre		10 mm
10,000,000	1,000,000	100,000	10,000	1000	100	10	millimètre	1 mm

Maritime system before 1793

							Metric
lieue marine de 20 au degré							5554.754 284 m
3	mille marin de 60 au degré						1851.584 761 m
28½	9½	encablure^a					194.903 659 m
360	120	12 ^{17/19}	noeud				15.429 873 m
3420	1140	120	9½	brasse marine^b			1.624 197 m
205,200	68,400	7200	570	60	palme		29.326 mm

^aAfter January 1, 1840, as **encablure nouvelle**, = 200.000 m

^bAlso called **pas géométrique**

Maritime system after January 1, 1840

			Metric
lieue marine de 20 au degré			5556.031 111 m
3	mille marin de 60 au degré		1852.010 370 m
360	120	noeud	15.433 420 m

Other measures reported after 1840:

1 **mille géographique de 15 au degré** =
7408.041 481 m;

1 **lieue de 18 au degré** = 6173.367 901 m;

1 **lieue de géographique de 25 au degré** =
4444.824 889 m;

			Metric
degré équatoriale			111,306.5 m
25	lieue commune or lieue de française		4452.26 m
57,007½	2280‰	toise	1.952 m

		Metric
lieue moyenne		5008.79 m
2534	toise	1.977 m

For yarn before 1819

			Metric
echeveau			1.429 m
10	echevette		142.9 mm
700	70	faden	2.041 mm

For cotton after decree of May 26, 1819

		Metric
echeveau		1000 m
10	echevette	100 m

For silk after decree of May 26, 1819

		Metric
echeveau		12,000 m
4	echevette	3000 m

43.4 Units of Area

Traditional measures:

1 **setier** = the amount of land that could be sown
with one setier of seed.

Upper scale used before 1793

			Metric
lieue de poste carrée			15,194,974.535 2 m ²
4	mille de poste carré		3,798,743.633 8 m ²
4,000,000	1,000,000	toise carrée	3.798 743 633 8 m ²

Middle scale used before 1793

						Metric
arpent des Eaux et Forêts						5107.199 774 331 m ²
$1^{49/81}$	arpent de Paris					3418.869 270 420 m ²
100	$66^{114/121}$	perche des Eaux et Forêts				51.071 997 743 m ²
$149^{31/81}$	100	$1^{49/81}$	perche de Paris			34.188 692 704 m ²
$1344^{4/9}$	900	$13^{4/9}$	9	toise carrée		3.798 743 634 m ²
48,400	32,400	484	324	36	pied carrée	10.552 065 649 dm ²

Lower scale used before 1793

			Metric
pied carrée			10.552 065 649 dm ²
144	pouce carré		7.327 823 cm ²
20,736	144	ligne carré	5.089 mm ²

Division of toise carrée used before 1793

					Metric
toise carrée					3.798 743 634 m ²
6	toise-pied				63.312 394 dm ²
72	12	toise-pouce			5.276 033 dm ²
864	144	12	toise-ligne		43.967 cm ²
10,368	1728	144	12	toise-point	3.664 cm ²

System according to law of August 1, 1793

				Metric
are				10,000 m ²
10,000	mètre carré			1 m ²
100,000	10	décimètre carré		1 dm ²
1,000,000	100	10	centimètre carré	1 cm ²

System according to law of April 7, 1795 and December 10, 1799

					Metric
hectare					10,000 m ²
100	are				100 m ²
10,000	100	centiare or mètre carré			1 m ²
100,000	1000	10	décimètre carré		1 dm ²
1,000,000	10,000	100	10	centimètre carré	1 cm ²

Système usuel, used from 1812 until 1840, by decrees of February 12, 1812 and March 28, 1812

					Metric
lieue usuelle carrée					160,000 a
4,000,000	toise usuelle carrée				4 m ³
144,000,000	36	pied usuel carré			111.111 111 dm ³
20,736,000,000	5144	144	pouce usuel carré		771.605 cm ³
2,985,984,000,000	746,496	20,736	144	ligne usuelle carrée	5.358 cm ³

System according to law of November 4, 1800

					Metric
hectare or arpent					10,000 m ²
100	are or perche carrée				100 m ²
10,000	100	centiare or mètre carré			1 m ²
100,000	1000	10	décimètre carré		1 dm ²
1,000,000	10,000	100	10	centimètre carré	1 cm ²

Metric system after January 1, 1840

										Metric
myriamètre carré										1,000,000 a
100	kilomètre carré									10,000 a
10,000	100	hectare								100 a
1,000,000	10,000	100	are							100 m ²
100,000,000	1,000,000	10,000	100	centiare						1 m ²
10,000,000,000	100,000,000	1,000,000	10,000	100	decimètre carré					1 dm ²
1,000,000,000,000	10,000,000,000	100,000,000	1,000,000	10,000	100	centimètre carré				1 cm ²
100,000,000,000,000	1,000,000,000,000	10,000,000,000	100,000,000,000	1,000,000	10,000	100	millimètre carré			1 mm ²

Maritime system after January 1, 1840

			Metric
lieue marine de 60 au degré carré			308,694.817 064 a
9	mille marin de 60 au degré carré		34,299,424 118 a

43.5 Units of Volume

Traditional system for sawn lumber used before 1789

							Metric
grand cent							10.283 181 m ³
1 ⁷ / ₁₈	toise cube						7.403 890 m ³
12 ¹ / ₂	9	somme					822.654 480 dm ³
100	72	8	solive or pièce^a				102.831 810 dm ³
300	216	24	3	pied cube			34.277 270 dm ³
600	432	48	6	2	pied de solive		17.138 635 dm ³
7200	5184	576	72	24	12	pouce de solive	1.428 dm ³
86,400	62,208	6912	864	288	144	ligne de solive	119 cm ³

^aIn Normandy, it was also divided into 432 chevilles. 1 **cheville** = 238 cm³

Traditional system for firewood used before 1789

					Metric
corde de porte					4.798 818 m ³
–	corte de grand bois				4.387 491 m ³
–	–	corde^a			3.839 054 m ³
–	–	2	voie de Paris		1.919 527 m ³
140	128	112	56	pied cube	34.277 270 dm ³

^aAlso called **corde de bois**, **corde des eaux et forêts**, **corde d'ordonnance** and **corde de Paris**. One **corde des eaux et forêts** was stated as 128 pieds de cubes in 1669

Other reported measures mainly used at sea before 1789

			Metric
voie de Paris^a			1.919 527 m ³
1 ¹ / ₃	tonneau de mer^b		1.439 645 m ³
56	42	pied cube	34.277 270 dm ³

^aUsed for charcoal

^bStated as 42 pieds de cubes in 1681

Subdivisions of the toise cube

					Metric
toise cube					7.403 890 m ³
6	toise-toise-pied				1.233 981 m ³
72	12	toise-toise-pouce			10.283 2 dm ³
864	144	12	toise-toise-ligne		85.69 cm ³
10,368	1728	144	12	toise-toise-point	7.14 cm ³

Subdivisions of the solive for timber used before 1789

				Metric
solive				102.831 810 dm ³
6	pied de solive			17.138 635 dm ³
72	12	pouce de solive		1.428 220 dm ³
864	144	12	ligne de solive	119.018 cm ³

System for timber used between 1795 and 1812, according to laws of April 7, 1795, December 10, 1799 and November 4, 1800

		Metric
stère		1 m ³
10	décistère	100 dm ³

System for timber used between 1812 and 1840, according to decrees of February 12, 1812 and March 28, 1812

			Metric
toise usuelle cube			8 m ³
4	voie nouvelle		2 m ³
216	54	pied usuel cube	37.037 dm ³

Metric scale for firewood used after 1840

			Metric
decastêr			10 m ³
10	stêr		1 m ³
100	10	solive	100 dm ³

Other measures used during the nineteenth century:

1 **lieue cubic moyenne** = 125.660 447 km³;

1 **lieue cubic commune** or **lieue cubic géographique** = 88.255 454 km³ ;

1 **lieue cubic nouvelle** = 64 km³ ;

1 **voie de Paris** (for firewood) = $4 \times 4 \times 3\frac{1}{2}$ pied de Roi = 1922.3 m³.

Metric system after January 1, 1840

						Metric
décastère						10 m ³
100	stère					1 m ³
10,000	100	décistère				100 dm ³
1,000,000	10,000	100	décimètre cube			1 dm ³
100,000,000	1,000,000	10,000	100	centimètre cube		1 cm ³
10,000,000,000	100,000,000	1,000,000	10,000	100	millimètre cube	1 mm ³

43.6 Units of Dry Capacity

For lime and grain (except oats), according to law of 1670

								Metric
muid								1873.195 666 L
12	setier							156.099 639 L
24	2	mine						78.049 819 L
48	4	2	minot					39.024 910 L
144	12	6	3	boisseau				13.008 303 L
576	48	24	12	4	quart			3.252 076 L
2304	192	96	48	16	4	litron		813.019 mL
36,864	3072	1536	768	256	64	16	mesurette	50.814 mL

For oats (sold stricken), according to law of 1670

								Metric
muid								3746.391 333 L
12	setier							312.199 278 L
24	2	mine						156.099 639 L
48	4	2	minot					78.049 819 L
288	24	12	6	boisseau				13.008 303 L
1152	96	48	24	4	quart			3.252 076 L
4608	384	192	96	16	4	litron		813.019 mL
73,728	6144	3072	1536	256	64	16	mesurette	50.814 mL

For salt in Paris before 1793

								Metric
muid								2497.594 222 L
12	setier							208.132 852 L
24	2	mine						104.066 426 L
48	4	2	minot					52.033 213 L
192	16	8	4	boisseau				13.008 303 L
768	64	32	16	4	quart			3.252 076 L
3072	256	128	64	16	4	litron		813.019 mL
49,152	4096	2048	1024	256	64	16	mesurette	50.814 mL

For charcoal (sold heaped) before 1793

								Metric ^a
muid								4162.657 034 L
10	setier							416.265 703 L
20	2	mine or charge						208.132 852 L
40	4	2	minot					104.066 426 L
320	32	16	8	boisseau				13.008 303 L
1280	128	64	32	4	picotin or quart			3.252 076 L
5120	512	256	128	16	4	litron		813.019 mL
81,920	8192	4096	2048	256	64	16	mesurette	50.814 mL

^aAll values underestimate the actual amount of coal, as it was sold heaped

For coal (sold heaped) before 1840

					Metric ^a
voie					1170.747 291 L
15	minot				78.049 819 L
30	2	demi-minot			39.024 910 L
90	6	3	boisseau		13.008 303 L
360	24	12	4	quarte	3.252 076 L

^aAll values underestimate the actual amount of coal, as it was sold heaped

System, according to law of November 4, 1800

				Metric
kilolitre or muid				1000 L
10	hectolitre or setier			100 L
100	10	décalitre or boisseau		10 L
1000	100	10	litre or pinte	1 L

Système usuel for cereals used from 1812 to 1840, according to decrees of February 12, 1812 and March 18, 1812

							Metric
muid							1800.000 000 L
12	setier						150.000 000 L
24	2	mine					75.000 000 L
48	4	2	minot				37.500 000 L
144	12	6	3	boisseau			12.500 000 L
576	48	24	12	4	quarte		3.125 000 L
2304	192	96	48	16	4	litron	78.125 000 mL

Système usuel used from 1812 to 1840, according to decrees of February 12, 1812 and March 18, 1812

									Metric
double boisseau									25.000 000 L
2	boisseau								12.500 000 L
4	2	demi-boisseau							6.250 000 L
8	4	2	quart						3.125 000 L
12½	6¼	3⅞	1⅞	double litre					2.000 000 L
25	12½	6¾	3⅞	2	litre				1.000 000 L
50	25	12½	6¾	4	2	demi-litre			500.000 mL
100	50	25	12½	8	4	2	quart de litre		250.000 mL
200	100	50	25	16	8	4	2	huitième de litre	125.000 mL

For coal after January 1, 1840

				Metric
voie				1500 L
2½	muid			600 L
10	4	manne		150 L
15	6	1½	ettolitre	100 L

For plaster after January 1, 1840

			Metric
muid			900 L
9	ettolitre		100 L
36	4	sac	25 L

43.7 Units of Liquid Capacity

Upper scale for general use in Paris before 1793

										Metric
tonneau										536.439 272 746 L
$1\frac{1}{3}$	pipe or queue									402.329 454 559 L
2	$1\frac{1}{2}$	muid								268.219 636 373 L
$2\frac{2}{3}$	2	$1\frac{1}{3}$	barrique, demi-queue, or poinçon							201.164 727 280 L
4	3	2	$1\frac{1}{2}$	feuillette						134.109 818 186 L
6	$4\frac{1}{2}$	3	$2\frac{1}{4}$	$1\frac{1}{2}$	tierçon					89.406 545 458 L
8	6	4	3	2	$1\frac{1}{3}$	quartreau				67.054 909 093 L
72	54	36	27	18	12	9	velte or setier			7.450 545 455 L
288	216	144	108	72	48	36	4	pot or quart		1.862 636 364 L
576	432	288	216	144	96	72	8	2	pinte	931.318 181 85 mL

Lower scale for general use in Paris before 1793

							Metric
pinte							931.318 181 85 mL
2	chopine or setier						465.659 090 92 mL
4	2	demi-setier					232.829 545 46 mL
8	4	2	posson				116.414 772 73 mL
16	8	4	2	demi-posson			58.207 386 36 mL
32	16	8	4	2	roquille		29.103 693 18 mL

For champagne and most wines in Paris before 1793

										Metric
pipe or queue										410.918 L
$1\frac{1}{2}$	muid									273.946 L
2	$1\frac{1}{3}$	barrique								205.459 L
3	2	$1\frac{1}{2}$	feuilleau							136.973 L
$4\frac{1}{2}$	3	$2\frac{1}{4}$	$1\frac{1}{2}$	tierçon						91.315 L
6	4	3	2	$1\frac{1}{3}$	quartreau					68.486 L
54	36	27	18	12	9	velte or setier				7.601 L
216	144	108	72	48	36	4	pot or quart			1.902 L
432	288	216	144	96	72	8	2	pinte		951.2 mL

For Bordeaux wines in Paris before 1793

					Metric
barrique					226.32 L
1½	tiercon				150.88 L
2	1⅓	Feuillette			113.16 L
30	20	15	velte		7.54 L
240	160	120	8	pinte	943.0 mL

Other reported measures before 1793:

1 **muid** (legal value) = 274.239 L;

1 **pinte** (legal value) = 952.219 mL.

System, according to law of August 1, 1793

						Metric
cade						1000 L
10	décicade					100 L
100	10	centicade				10 L
1000	100	10	pinte			1 L
10,000	1000	100	10	décipinte		100 mL
100,000	10,000	1000	100	10	centipinte	10 mL

System, according to law of January 19, 1794

						Metric
cade						1000 L
10	décicade					100 L
100	10	centicade				10 L
1000	100	10	cadil			1 L
10,000	1000	100	10	décicadile		100 mL
100,000	10,000	1000	100	10	centicadile	10 mL

System, according to laws of April 7, 1795 and December 10, 1799

						Metric
kilolitre						1000 L
10	hectolitre					100 L
100	10	décalitre				10 L
1000	100	10	litre			1 L
10,000	1000	100	10	décilitre		100 mL
100,000	10,000	1000	100	10	centilitre	10 mL

System, according to law of November 4, 1800

			Metric
décalitre or velte			10 L
10	litre or pinte		1 L
100	10	décilitre or verre	100 mL

Measures used after 1811:

1 **pipe** (for brandy and spirits) = 620 L;

1 **tonneau** (for beer) = 75 L.

Système usuel used from 1812 to 1840, according to decrees of February 12, 1812 and March 18, 1812

					Metric
pinte or litre					1.000 000 L
2	demi-litre				500.000 mL
4	2	quart de litre			250.000 mL
8	4	2	huitième de litre		125.000 mL
16	8	4	2	seizième de litre	62.500 mL

43.8 Units of Capacity

Metric system^a for both dry commodities and liquids after January 1, 1840

								Metric
myrialitre								10,000 L
10	kilolitre							1000 L
100	10	hectolitre						100 L
1000	100	10	décalitre					10 L
10,000	1000	100	10	litre				1 L
100,000	10,000	1000	100	10	décilitre			100 mL
1,000,000	100,000	10,000	1000	100	10	centilitre		10 mL
10,000,000	1,000,000	100,000	10,000	1000	100	10	millilitre	1 mL

^aAccording to decree of June 16, 1839, there was also the demi-hectolitre = 50 L, double décalitre = 20 L, demi-décalitre = 5 L, double litre = 2 L, demi-décilitre = 50 mL and double centilitre = 20 mL

43.9 Units of Weight

Poids de Carlemagne used from the late eighth century to 1350

						Metric
livre romaine or livre esterlin						367.129 g
12	once					30.594 g
20	1⅔	sou				18.356 g
240	20	12	denier			1.530 g
480	40	24	2	obol		764.8 mg
5760	480	288	24	12	grain	63.7 mg

Poids de marc used from 1350 to 1557

			Metric
livre poids de marc			489.506 g
2	marc		244.753 g
16	8	once	30.594 g

poids de marc used from 1557 to 1681

							Metric
livre poids de marc							489.505 846 6 g
2	marc						244.753 g
16	8	once					30.594 g
128	64	8	gros or dragm				3.824 g
384	192	24	3	denier or scrupule			1.275 g
640	320	40	5	1 $\frac{2}{3}$	obole		764.8 mg
9216	4608	576	72	24	14 $\frac{2}{5}$	grain	53.1 mg

Poids de marc used from 1681 to 1793

										Metric
tonneau										979.011 693 g
2	millier									489.505 847 g
6 $\frac{2}{3}$	3 $\frac{1}{3}$	charge								146.851 754 g
20	10	3	quintal							48.950 584 7 g
2000	1000	300	100	livre						489.505 846 6 g
4000	2000	600	200	2	marc					244.752 923 3 g
32,000	16,000	4800	1600	16	8	once				30.594 115 4 g
256,000	128,000	38,400	12,800	128	64	8	gros			3.824 264 4 g
18,432,000	9,216,000	2,764,800	921,600	9216	4608	576	72	grain		53.114 8 mg
442,368,000	92,160,000	66,355,200	22,118,400	221,184	110,592	13,824	1728	24	prime or carob	2.213 1 mg

Other measures reported during the eighteenth century :

1 **marc de la Rochelle** = 244.752 9 g;

1 **marc de Limoges** = 240.93 g;

1 **marc de Toure** = 237.87 g;

1 **marc de Troyee et Paris** = 260.05 g.

System according to law of August 1, 1793

									Metric
bar									1000 kg
10	décibar								100 kg
100	10	centibar							10 kg
1000	100	10	grave						1 kg
10,000	1000	100	10	décigrave					100 g
100,000	10,000	1000	100	10	centigrave				10 g
1,000,000	100,000	10,000	1000	100	10	gravet			1 g
10,000,000	1,000,000	100,000	10,000	1000	100	10	décigravet		100 mg
100,000,000	10,000,000	1,000,000	100,000	10,000	1000	100	10	centigravet	10 mg

System according to decrees of February 12, 1812 and March 28, 1812

					Metric
livre usuelle					500.000 g
4	quarteron				125.000 g
16	4	once usuelle			31.250 g
128	32	8	gros usuel		3.906 g
9216	2304	576	72	grain usuel	54.2 mg

For gold and silver from 1350 until 1557

					Metric
marc					244.752 923 g
8	once				30.594 115 g
64	8	gros			3.824 264 g
192	24	3	denier		1.274 755 g
4608	576	72	24	grain	53.115 mg

For gold and silver from 1557 to 1793

						Metric
once						30.594 116 g
10	gros					3.059 411 6 g
20	2	estelin				1.529 705 8 g
40	4	2	maille d'estelin			764.853 mg
80	8	4	2	félin		382.426 mg
570	57	28½	14¼	7⅞	grain	53.115 mg

Apothecary units from 1350 to 1793

			Metric
livre poids de marc			489.505 846 6 g
128	drachm		3.824 g
384	3	scruple	1.275 g

Upper scale before 1812

							Metric
millier							489.505 846 6 kg
10	quintal						48.950 584 66 kg
1000	100	livre					489.505 846 6 g
2000	200	2	marc				244.752 925 g
16,000	1600	16	8	once			30.594 116 g
20,000	2000	20	10	1¼	sol		24.475 292 g
128,000	12,800	128	64	8	6⅘	gros or drachme	3.824 264 g

System used from 1800 to 1812 by decree of *13 Brumaire an IX*

					Metric
livre					1 kg
10	once metrique				100 g
100	10	gros			10 g
1000	100	10	denier		1 g
10,000	1000	100	10	grain	100 mg

Système usuel used from 1812 to 1840 by decree of March 28, 1812

					Metric
livre usuelle					500 g
2	marc usuel				250 g
4	2	quarternon			125 g
16	8	4	once usuelle		31.25 g
128	64	32	8	gros	3.906 g
9216	4608	2304	576	72	grain nouvelle 54.25 mg

Upper scale of *systeme metrique de poids*,^a used after 1 January 1840^b

						Metric
millier						1000 kg
10	quintal					100 kg
100	10	myriagramme				10 kg
1000	100	10	kilogramme^c			1 kg
10,000	1000	100	10	hectogramme		100 g
100,000	10,000	1000	100	10	décagramme	10 g
1,000,000	100,000	10,000	1000	100	10	gramme 1 g

^aThe system was first presented by the French National Assembly in 1791, defined in 1795, and ratified in 1799

^bAccording to decree of June 16, 1839, there was also the **demi-quintal** = 50 kg, **double myriagramme** = 20 kg, **demi-kilogramme** = 5 kg, **double hectogramme** = 200 g, **demi-hectogramme** = 50 g, **double décagramme** = 20 g and **demi-décagramme** = 5 g

^cIn 1799, the kilogram was defined as a décistère (1000 cm³) of water at normal atmospheric pressure at 4 °C

Lower scale of *systeme metrique de poids* used after January 1, 1840^a

				Metric
gramme				1 g
10	décigramme			100 mg
100	10	centigramme		10 mg
1000	100	10	milligramme	1 mg

^aAccording to decree of June 16, 1839, there was also the **demi-gramme** = 500 mg, **double décigramme** = 200 mg, **demi-décigramme** = 50 mg, **double centigramme** = 20 mg, **demi-centigramme** = 5 mg and **double milligramme** = 2 mg

Other reported measures after 1840:

- | | |
|--|--|
| <p>1 demi-millier (for hay, straw and clover) = 500 kg;</p> | <p>1 quintal (for sugar, oil of linseed and rape seed) = 159 kg;</p> <p>1 quintal (for rye) = 115 kg;</p> <p>1 quintal (for flour and wheat) = 100 kg;</p> <p>1 quintal (for oil) = 100 kg or 106.470 L;</p> |
|--|--|

- 1 **ettolitro** (for wheat) = 75 kg;
- 1 **ettolitro** (for rye) = 70 kg;
- 1 **ettolitro** (for Turkish wheat) = 66 kg;
- 1 **ettolitro** (for barley) = 64 kg;
- 1 **ettolitro** (for oats) = 45 kg.

Système de poids d'easterlin for precious metals used before 1840

						Metric
livre						489.41 g
2	marc					244.70 g
16	8	once				30.588 g
320	160	20	esterlin			1.529 4 g
640	320	40	2	maille		764.7 mg
1280	640	80	4	2	félin	382.3 mg

For diamonds and jewels before 1793

			Metric
once			29.592 000 g
144	carat		205.500 mg
576	4	grain	51.375 mg

For medical use before 1731

					Metric
livre romaine					367.129 g
12	once				385 g
96	8	dragme			30.594 115 g
288	24	3	scrupule		3.824 264 g
5760	480	60	20	grain	1.274 755 g
					63.738 mg

for medical use after 1731

					Metric
livre poids de marc					489.505 g
					847 g
16	once				30.594 115 g
128	8	dragme			3.824 264 g
384	24	3	scrupule		1.274 755 g
9216	576	72	24	grain	53.115 mg

système de poids pharmaceutique, for pharmaceutical, used before 1791

						Metric
pharmaceutique livre						367.142 g
12	once					30.595 g
96	8					3.824 g
288	24					1.275 g
576	48					637.4 mg
5760	480					63.74 mg
					grain	
					obole	
					10	
					20	
					2	
					scruple	
					3	
					60	
					gros	

Lower scale of *système métrique de poids pharmaceutique*, used after January 1, 1840

									Metric
once									32 g
2	quatre gros								16 g
$2\frac{2}{3}$	$1\frac{1}{3}$	trois gros							12 g
4	2	$1\frac{1}{2}$	deux gros						8 g
8	4	3	2	gros					4 g
16	8	6	4	2	demi-gros				2 g
320	160	120	80	40	20	double grain			100 mg
640	320	240	160	80	40	2	grain		50 mg
1280	640	480	320	160	80	4	2	demi-grain	25 mg

Some Local Systems of Measurement

As the number of local measurement system in France was indubitably extensive in number, I have been compelled to choose to report only the systems for a few regions.

Other measures reported during nineteenth century:

1 **aune** (for cloth in Bordeaux) = 1.191 078 m;
1 **aune** (at Bayonne) = 885.036 mm.

43.10 Alsace

43.10.1 Units of Length

In Strasbourg

		Metric
Ruthe or canne		4.656 031 m
10	pied de ville	465.603 1 m

43.10.2 Units of Liquid Capacity

1 sester (in Strasbourg) = 23.985 L.

43.11 Aquitaine

43.11.1 Units of Length

In Bordeaux

			Metric
latte			2.497 180 m
$2\frac{2}{5}$	pas		891.85 mm
7	$2\frac{1}{2}$	pied	356.74 mm

43.11.2 Units of Area

At Aiguillon and Bourran

			Metric
carterée			7289.827 2 m ²
432	escat		16.874 6 m ²
62,208	144	pied carré	11.718 4 dm ²

For vineyards in Bordeaux

					Metric
journal					3192.784 872 m ²
32	réges				99.774 527 m ³
512	16	carreau or latte carrée			6.235 907 952 4 m ³
$4014\frac{2}{25}$	$125\frac{1}{25}$	$7\frac{2}{25}$	pas carrée		795.396 422 5 dm ³
25,088	784	49	$6\frac{1}{4}$	pied carrée	127.263 427 6 dm ³

Médoc scale used in Bodeaux area

				Metric
journal				3181.585 7 m ²
4	sadon			795.396 425 m ²
40	10	réges		79.539 642 5 m ²
3000	750	75	pied de Vigne	1.060 528 6 m ²

At Pau

					Metric
arpent					3754.555 2 m ²
144	escat				26.073 3 m ²
3168	22	empan de côte			1.185 15 m ²
69,696	484	22	empan carré		5.387 dm ²
527,076	3660 ¹ / ₄	166 ³ / ₈	7 ¹ / ₁₆	canne carré	71.23 cm ²

43.11.3 Units of Dry Capacity

At Bayonne

		Metric
sac		82.122 620 L
2	conque	41.061 310 L

Other measures reported during nineteenth century:

1 **boisseau** (in Bordeaux) = 76.727 13 L.

43.11.4 Units of Liquid Capacity

At Bayonne

				Metric
tonneau				1106.870 40 L
4	barrique			276.717 60 L
120	30	velte		9.223 92 L
960	240	8	pinte	1.152 99 L

For wine and vinegar in Bordeaux

						Metric	Metric
tonneau						904.80 L	913.156 800 L
2⅔	pipe					377.00 L	380.482 000 L
4	1⅓	barrique				226.20 L	228.289 200 L
6	2½	1½	tierçon			150.80 L	152.192 800 L
8	3⅓	2	1⅓	feuillette or demi-barrique		113.10 L	114.144 600 L
120	50	30	20	15	velte	7.54 L	7.609 640 L

43.12 Brittany

43.12.1 Units of Length

In Rennes

		Metric
lieue		4482.78 m
2300	toise	1.949 m

43.13 Burgundy

43.13.1 Units of Area

1 **grande journal** (for agricultural use) = 360 perches carrées = 3428 m²;

1 **journal** (for agricultural use in some areas) = 400 toises carrées = 2372 m²;

1 **petite journal** (for agricultural use) = 240 perches carrées = 2285.6 m²;

1 **journal** (for agricultural use in some areas) = 180 toises carrées = 1714 m²;

1 **boisselée** (for hemp-fields) = ¹/₄–¹/₈ journal;

1 **grande perche carrée** (for agricultural use) = 42.2 m²;

1 **perche carrée** (for agricultural use) = 9.52 m²;

1 **toise carrée** (for agricultural use) = 5.93 m².

For woodlands

			Metric
arpent d'ordonnance			5107 m ²
100	perche carrée		5107 dm ²
2200	22	pied chacune	232.14 dm ²

43.13.2 Units of Volume

- 1 **corde** (for firewood in Châtillon-sur-Seine) = 8 pieds × 4 pieds × 4 pieds = 4.386 m³.
 1 **corde** (for firewood in Frôlois) = 8 pieds × 4 pieds × 3 pieds + 8 pouces = 4.019 m³.
 1 **corde** (for firewood in Marcy) = 8 pieds × 4 pieds × 2½ pieds = 2.740 m³.
 1 **corde** (for firewood in Béze) = 8 pieds × 4 pieds × 2 pieds + 4 pouces = 2.557 m³.
 1 **module** (for firewood in Béze) = 4 pieds × 4 pieds × 3 pieds + 8 pouces = 2.010 m³.
 1 **corde** (for firewood in Til-Châtel) = 8 pieds × 3 pieds + 8 pouces × 22 pouces = 1.843 m³.
 1 **module** (for firewood in Dijon) = 3½ × 3½ × 3½ pieds = 1.469 6 m³.

43.13.3 Units of Dry Capacity

- 1 **émine** (at Maxilly-sur-Saône) = 25 boisseau = 476.07 L;
 1 **émine** (at Saint-Jean-de-Losne) = 17 boisseau = 468.06 L;
 1 **émine** (at Auxonne) = 25 boisseau = 433.62 L;
 1 **émine** (at Dijon) = 30 L.

Metric linked system for cereals

				Metric
muid				3000 L
12	setier			250 L
24	2	émine		125 L
192	16	8	boisseau	15.625 L

For coal in Dijon

		Metric
tonneau		226.18 L
5	banneton	45.236 L

For cereals at Mâcon

		Metric
ânée or asnée		255.75 L
20	measure	12.79 L

43.13.4 Units of Liquid Capacity

- 1 **pinte** (for milk in Gemeaux) = 2.639 L;
 1 **pinte** (for oil in Dijon) = 1.939 L.

Upper scale used during eighteenth century in Dijon

					Metric
muid or pièce					232.56 L
2	feuillette				116.28 L
18	9	setier			12.92 L
36	18	2	quarte		6.46 L
144	72	8	4	pinte	1.615 L

Scale used during nineteenth century in Dijon

					Metric
tonneau					228.24 L
240	pinte				951 mL
480	2	pintet or chopine			475.5 mL
960	4	2	chau-veau		237.75 mL
1920	8	4	2	mesur-otte	118.875 mL

43.14 Centre

43.14.1 Units of Length

In Beauce and Gâtinais

		Metric
lieue		3313.36 m
1700	toise	1.949 m

43.14.2 Units of Area

In Eure-et-Loir

			Metric
setier			3377.2 m ²
80, 100, or 133⅓	perche carré		42.215 m ²
32,000, 40,000, or 53, 333⅓	400	pied carré	10.554 dm ²

43.14.3 Units of Liquid Capacity

Old scale in Orléans

					Metric
queue					439.582 181 L
–	muid				283.120 727 L
2	–	demi queue			219.791 090 L
–	–	–	quartaut		103.376 318 L
472	304	236	111	pinte	931.318 mL

New scale in Orléans

				Metric
queue				447.032 726 L
2	demi queue			223.516 363 L
480	240		pinte	931.318 mL

43.15 Champagne-Ardenne

43.15.1 Units of Length

			Metric
lieue			4449.65 m
2283	toise		1.949 m

43.15.2 Units of Area

In Ardennes

setier			
80	verges carré		
20,480	256	pied carré	
1,310,720	16,384	64	pouce carré

43.15.3 Units of Dry Capacity

During twelfth to fourteenth centuries :

1 jointée, jonteia, or juncta = as much grain or salt as can be held in two hands pressed together.³

1 émine (at Langres) = 8 bichets = 392 L;
1 émine (at Choiseul) = 5 bichets = 270 L;
1 setier (at Rheims) = 130 poids de marc = 85 L;
1 setier (for wheat at Rethel) = 112 poids de marc = 72 L;
1 setier (at Châlons-sur-Marne (present Châlons-en-Champagne)) = 10 Parisian boisseaux = 130 L, or 200 poids de marc = 97.9 kg;

For oats at Briel and at Troyes

		Metric
setier		384 L
16	boisseau	24 L

43.16 Corsica

43.16.1 Units of Length

At Ajaccio

		Metric
miglio		1612.539 50 m
6500	palmo	248.083 mm

43.16.2 Units of Dry Capacity

At Ajaccio

					Metric
mina					116.531 808 kg
1½	staio				99.884 407 L
2⅓	2	mezzino			49.942 203 L
14	12	6	bacino		8.323 701 L

43.16.3 Units of Liquid Capacity

At Bastia

						Metric
barile						139.968 L
2	soma					69.984 L
12	6	zucca or zucche ^a				11.664 L
108	54	9	boccale or pinta			1.296 L
432	216	36	4	quarta		324 mL

^aSometimes reported as 2.630 L

³ [BOUR4, p. 78].

For wine at Ajaccio

					Metric
baile					63.150 L
2	soma				31.575 L
4	2	otro			15.787 5 L
12	6	3	zucca		5.262 5 L
108	54	27	9	pinta	584.722 mL

For oil at Ajaccio

				Metric
soma				11.494 40 L
20	pinta			574.72 mL
40	2	mezzetta		287.36 mL
80	4	2	quarto	143.68 mL

43.16.4 Units of Weight

At Ajaccio

		Metric
libbra sottile		337.759 kg
12	oncia	28.146 6 g

1 **libbra grossa** = 489.506 g.

43.17 Franche-Comté

43.17.1 Units of Dry Capacity

1 **émine** (at Dole, Pontarlier and Salins) = 39 L;

1 **émine** (at Villers-Sexel) = 30 L;

1 **émine** (at Blamont, Héricourt and Montbéliard) = 26 L.

43.18 Île-de-France

43.18.1 Units of Weight

Traditional system in Paris

								Metric
livre								489.506 g
2	marc							244.753 g
8	4	huitième						61.188 g
16	8	2	once					30.594 g
128	64	16	8	gros or drachme				3.824 g
384	192	48	24	3	denier or scrupule			1.275 g
9216	4608	1152	576	72	24	grain		53.12 mg
221,184	110,592	27,648	13,824	1728	576	24	carobe	2.21 mg

For fine use in Paris

							Metric
once							30.594 g
8	drachme or gros						3.824 g
20	2½	esterlin^a					1.530 g
24	3	1⅓	scrupule				1.275 g
80	10	4	3⅓	felin^a			382.5 mg
576	72	28⅔	24	7⅕	grain		53.12 mg
13,824	1720	691⅓	576	172⅕	24	prime or carobe	2.21 mg

^aFor gold and silver

43.19 Languedoc-Roussillon

43.19.1 Units of Length

		Metric
lieue		5847.11 m
3000	toise	1.949 m

At Montpellier

		Metric
canne		1.980 743 m
8	palme	247.593 mm

Other reported measures:

1 **canne** (at Nîmes) = 2.517 908 m.

43.19.2 Units of Area

At Beaucaire

				Metric
salmée				6076.8 m ²
8	émine			759.60 m ²
80	10	picotin		75.96 m ²
1569	196 $\frac{1}{8}$	19 $\frac{49}{80}$	canne carré	3.873 m ²

At Nîmes

				Metric
charge				6700.20 m ²
12	éminée			558.35 m ²
96	8	boisseau		69.79 m ²
1716	143	17 $\frac{7}{8}$	canne carré	3.904 m ²

At Uzès

				Metric
salmée				6247.30 m ²
10	émine			624.73 m ²
100	10	vertison		62.47 m ²
1600	160	16	canne carré	3.904 m ²

43.19.3 Units of Dry Capacity

For wheat at Agde and at Beziers

		Metric	Metric
émine		80 L	58.86 kg
2	setier	40 L	60 poids de marc = 29.4 kg

For cereals at Carcassonne and at Narbonne

		Metric
émine		84 L
2	setier	42 L

For cereals at Castelnaudary

		Metric
émine		79 L
2	setier	39.5 L

Traditional system and metric-linked system at Montpellier

			Metric	Metric
setier			51.138 200 L	52 L
2	émine		25.569 100 L	26 L
4	2	quarte	12.784 550 L	13 L

43.19.4 Units of Liquid Capacity

For wine and spirits at Montpellier

					Metric
muid					608.420 000 L
18	setier				33.801 111 L
24	1 $\frac{1}{3}$	baral			25.350 833 L
72	4	3	quartal		8.450 278 L
576	32	24	8	pot	1.056 285 L

For oil at Montpellier

				Metric
charge				149.20 L
8	émine			18.65 L
16	2	quart or quartal		9.325 L
128	16	8	pot	1.166 L

For oil at Montpellier, based on [MART3]

			Metric	Metric
charge			152.105 000 L	137.100 kg
4	baral		38.026 250 L	34.275 kg
144	36	pot	1.056 285 L	952 g

43.19.5 Units of Weight

At Montpellier

						Metric
quintal						40.792 150 kg
100	livre					407.921 g
1600	16	once				25.495 g
12,800	128	8	gros			3.187 g
38,400	384	24	3	denier		1.062 g
921,600	9216	576	72	24	grain	44.3 mg

Other reported measures:

1 **livre** (at Nîmes) = 414.285 g;

1 **livre** (at Beaucaire) = 412.903 g.

43.20 Lorraine

43.20.1 Units of Length

1 **aune** (in Nancy) = 639.530 mm.

43.20.2 Units of Area

1 **journal** (in Nancy) = 20,519.547 m².

43.20.3 Units of Dry Capacity

For grain in Nancy

				Metric
réal				191.84 L
8	imal, ymal, or imale			23.98 L
9672	1209	pouces cubes parisienne		19.8 mL

43.21 Midi-Pyrénées

43.21.1 Units of Area

At Auch

					Metric
concade					3830.016 m ²
384	escat				9.974 m ²
5376	14	pan de côté			71.243 dm ²
75,264	196	14	pan carré		5.089 dm ²
230,496	600¼	42⅞	3⅙	canne carré	43.3 cm ²

43.21.2 Units of Dry Capacity

1 **setier** (at Toulouse) = 112 L.

For cereals at Albi

		Metric
Setier		117 L
9	Parisian boisseau	13 L

At Castres

				Metric	Metric
Setier				110.08 L	170 poids de marc = 83.2 kg
2	émine or demi- setier			55.07 L	41.6 kg
8	4	mégère		13.77 L	10.4 kg
32	16	4	boisseau	3.44 L	2.6 kg

For cereals at Gaillac and Lavaur

		Metric
Setier		139 L
2	émine or demi-setier	69.5 L

for cereals at Montauban

		Metric
setier		218 L
2	émine or demi-setier	109 L

For cereals at Nègrepelisse

		Metric
setier		242.22 L
2	sac	121.11 L

For cereals at Rabastens and Réalmont

		Metric	Metric
setier		172 L	128 L
2	demi-setier	86 L	64 L

43.22 Nord-Pas-de-Calais

43.22.1 Units of Length

1 **aune** (in Lille) = 693.260 mm;

1 **pied** (in Lille) = 297.770 mm.

43.22.2 Units of Area

1 **pied carré** (in Lille) = 8.866 7 dm².

43.22.3 Units of Volume

1 **pied cube** (in Lille) = 26.402 dm³.

43.22.4 Units of Dry Capacity

1 **setier** (for cereals at Boulogne) = 13½ Parisian boisseaux = 175.5 L;

1 **setier** (for wheat at Calais) = 13 Parisian boisseaux = 169 L, or 260 poids de marc = 127.3 kg;

1 **rasière** (in Lille) = 71.096 590 L.

43.22.5 Units of Weight

1 **livre** (in Lille) = 431.300 g.

43.23 Pays de la Loire

43.23.1 Units of Length

In former Anjou

		Metric
lieue		4482.78 m
2300	toise	1.949 m

43.23.2 Units of Dry Capacity

1 **setier** (at Saumur) = 156.10 L.

Traditional system at Nantes

		Metric
setier		145.68 L
16	boisseau	9.105 L

Metric-linked system at Nantes

			Metric
tonneau			1500 L
10	setier		150 L
120	12	boisseau	12.5 L

43.23.3 Units of Liquid Capacity

At Nantes

		Metric
barrique		231.000 L
30	velte	7.700 L

43.24 Picardie

43.24.1 Units of Area

In Aisne

				Metric
setier				2059.9, 2145.7, or 2574.9 m ²
48, 50, or 60	verges carré			42.915 m ²
23,232, 24,200, or 29,040	484	pied carré		8.867 dm ²
2,811,072, 2,928,200, or 3,513,840	58,564	121	pouce carré	7.328 cm ²

In Aisne, at La Fère, Chauny, and St. Quentin

				Metric
setier de Vermandois				3433.2 m ²
80	verges carré			42.915 m ²
38,720	484	pied carré		8.867 dm ²
4,685,120	58,564	121	pouce carré	7.328 cm ²

In Aisne

				Metric
setier				3791.5 m ²
70	verges carré			54.1 m ²
43,750	625	pied carré		8.666 dm ²

43.24.2 Units of Dry Capacity

- 1 **setier** (for cereals at Soissons) = 158 poids de marc = 77.3 kg;
- 1 **setier** (for cereals at Saint-Valery-sur-Somme) = 156.10 L;
- 1 **setier** (for cereals at Péronne) = 88 poids de marc = 57.53 L;
- 1 **setier** (for cereals at Noyon) = 86 poids de marc = 56 L;
- 1 **setier** (for wheat at La Fère) = 71 poids de marc = 45 L.

For cereals in Abbeville

		Metric
setier		130 L
10	Parisian boisseau	13 L

At Amiens

		Metric
setier		24.5–25.5 kg
4	piquet	12.5–13 poids de marc = 6.125–6.375 kg

For wheat at Doullens

		Metric
setier		208 poids de marc = 101.8 kg
4	quartier	25.45 kg
16	4 boisseau	6.36 kg

For cereals at Saint-Quentin

		Metric
setier		52 L
2	mencault	26 L

43.25 Poitou-Charentes

43.25.1 Units of Dry Capacity

For salt at Hiers-Brouage, Maraus, Marennes, Island of Oléron, Isle of Rhé, La Rochelle, Les Sables-d'Olonne, and La Tremblade

		Metric	Metric
setier		6 ¹⁸ / ₂₅ boisseaux = 260–280 kg	336 L
100	cent	2.6–2.8 kg	33.6 L

43.25.2 Units of Liquid Capacity

Some reported measures:

- 1 **pipe** (for wine and brandy in Cognac) = 566.250 000 L;
- 1 **barrique** (for wine and brandy in Cognac) = 174.163 440 L;
- 1 **velte** (for wine and brandy in Cognac) = 6.446 820 L.

43.26 Provence-Alpes-Côte d’Azur

Main sources: [EDLE] and [MART3]

43.26.1 Units of Length

In Marseille

				Metric
canne				2.012 700 m
8	pan			251.587 mm
72	9	pouce		27.954 mm
864	108	12	ligne	2.330 mm

At Nice

						Metric
rango						4.716 000 m
1½	trabucco					3.144 000 m
2¼	1½	canna				2.096 000 m
18	12	8	palmo			262.000 mm
216	144	96	12	pollice		21.833 mm
2592	1728	1152	144	12	linea	1.819 mm

Other reported measures:

- 1 aune (at Nice) = 1.188 446 m;
1 aune (in Marseille) = 1.170 099 m.

43.26.2 Units of Area

At Avignon

				Metric
salmée				6826.48 m ²
8	eminée or emine			853.31 m ²
1736	217	canne carré		3.932 m ²

At Embrun

				Metric
charge				4202.94 m ²
6	eminée			700.49 m ²
72	12	civayer		58.37 m ²
1050	175	14⅔ ₁₂	toise delphinale carré	4.003 m ²

At Gap

				Metric
charge				3988.68 m ²
6	eminée			664.78 m ²
72	12	civayer		55.40 m ²
1050	175	14⅔ ₁₂	toise carré	3.799 m ²

At Nice

				Metric
starata				1544.490 0 m ²
2	eminata			772.245 0 m ²
16	8	moturale		96.530 6 dm ²
128	64	8	ottava	12.066 3 dm ²

At Nice

		Metric
trabucco quadro		10.044 m ²
12	palmo quadro	83.7 dm ²

43.26.3 Units of Volume

For firewood at Nice

				Metric
trabucco cubo				31.077 610 m ³
3⅞	canna cuba			9.208 181 m ³
13½	4	canna solida		2.302 045 m ³
1728	512	128	palmo cubo	17.985 dm ³

43.26.4 Units of Dry Capacity

Metric-linked system for wheat and oats at Marseille

					Metric	Metric
charge					160 L	240 L
4	emine				40 L	60 L
8	2	panal			20 L	30 L
32	8	4	civadier		5 L	7.5 L
64	16	8	2	picotin	2.5 L	3.75 L

Metric-linked system for general use at Marseille

					Metric
charge					160 L
4	emine				40 L
8	2	panal			20 L
16	8	2	civadier		10 L
32	16	4	2	picotin	5 L

At Nice before 1850 and metric-linked system after 1850

					Metric	Metric
carica					161.750 000 L	160 L
4	sestiere				40.437 500 L	40 L
8	2	emina			20.218 750 L	20 L
16	4	2	quartiere		10.109 375 L	10 L
64	16	8	4	moturale	2.527 344 L	2.5 L

Other reported measures:

- 1 **barrata** (for horse fodder during the fourteenth century) = unknown size, but reported in 1386 by a Florentine writing in Avignon;
- 1 **emine** (at Toulon) = 2/5 setier = 52.01 L;
- 1 **emine** (at Montjustin) = 30 L;

43.26.5 Units of Liquid Capacity

For wine in Marseille and Toulon

					Metric
tonneau					888.104 000 L
14	millerole^a				63.436 000 L
56	4	escandal			15.895 000 L
840	60	15	pot		1.057 267 L
3360	240	60	4	quart or pichoun	264.317 mL

^aSometimes reported as 64.01 L

For oil in Marseille and Toulon

						Metric	Metric
tonneau						888.104 000 L	–
14	millerole					63.436 000 L	–
56	4	escandal				15.895 000 L	14.68 kg
672	48	12	livre de jauge			1.324 583 L	1.223 kg
2016	144	36	3	livre de poid		441.528 mL	407.8 g
2240	160	40	$3\frac{1}{3}$	$1\frac{1}{2}$	quarteron	397.375 mL	367.0 g

For wine at Nice before 1850

				Metric	Metric
carica				94.350 000 L	93.488 541 kg
2	barile or cantaro			47.175 000 L	46.744 270 kg
12	6	rubbio		7.862 500 L	7.790 712 kg
120	60	10	pinte	786.250 mL	779.071 g

43.26.6 Units of Weight

During the fourteenth century⁴:

1 **somata grossa** (for flour) = 10 mine =
unknown size.

At Nice before 1850

								Metric
cantaro								46.744 270 kg
6	rubbo							7.790 712 kg
60	10	rotolo						779.071 g
150	25	$2\frac{1}{2}$	libbra					311.628 g
1800	300	30	12	oncia				25.969 g
14,400	2400	240	96	8	ottavo			3.246 g
43,200	7200	720	288	24	3	denaro		1.082 g
1,036,800	172,800	17,280	6912	576	72	24	grano	45 mg

For gold, silver and coinage at Nice before 1850

					Metric
marc					244.752 923 g
8	once				30.594 115 g
64	8	gros			3.824 264 g
192	24	3	denier		1.274 755 g
4608	576	72	24	grain	53.115 mg

Other reported measures:

1 **setier** (for wheat at Arles) = 93 poids de marc
= 45.5 kg.

⁴Pratese in Avignon, 1368. *Archivio Datini. Registro*. 142.

43.27 Rhône-Alpes

43.27.1 Units of Length

In Chambéry

								Metric
course de poste ^a								7998.234 451 m
–	mille ^b							2469.135 802 m
–	–	mille ^c						2466.076 800 m
2946	909 ²³ / ₅₀	908 ¹ / ₃	toise de Savoie					2.714 947 m
23,568	7 275 ¹⁷ / ₂₅	7266 ⁷ / ₃	8	pied de Savoie				339.368 mm
282,816	87, 308 ⁷ / ₂₅	87,200	96	12	pouce			28.281 mm
3,393,792	1,047, 697 ²³ / ₂₅	1,046,400	1152	144	12	ligne		2.357 mm
40,725,504	12, 572, 375 ¹ / ₂₅	12,556,800	13,824	1728	144	12	point	196.4 µm

^aBefore 1818, reported as 5 milles = 12,330.384 m

^bAfter 1818

^cBefore 1818

In Lyon, based on [MART3]

		Metric
toise		2.563 200 m
7 ¹ / ₂	pied	341.760 mm

Other reported measures:

- 1 **grande lieue**, **lieue marine** or **lieue astronomique** = 2851 toises = 5556 m;
- 1 **lieue du Lyonnais** (in Lyon) = 2450 toises = 4775 m;
- 1 **lieue commune** = 2281 toises = 4444 m;
- 1 **petite lieu** or **lieue de poste** = 2000 toises = 3898 m;
- 1 **aune** (in Lyon) = 1.188 370 m or 1.174 160 m;
- 1 **aune** (in Grenoble) = 1.969 255 m.

43.27.2 Units of Area

- 1 **ouv** (for vineyards in Belleville and Monsols) = 800 pas² = 527.6 m²;
- 1 **hom** (for vineyards in Lyon) = 65¹/₃ toise² = 431.1 m².

For agricultural use

			Metric
bichetée or bicherée			1293.4 m ²
196	toise carrée		6.599 m ²
1764	9	pas carrée	0.733 m ²

In Chaméry

			Metric
journal			2948.368 m ²
400	toise carrée de la Savoie ^a		7.370 921 m ²
25,600	64	pied carrée	11.517 064 dm ²

^aThere was also a **toise carrée** = 36 pieds de camber carrées = 4.146 162 m²

43.27.3 Units of Volume

In Chaméry

			Metric
toise cube de la Savoie			20.001 699 m ³
–	toise cube		8.442 466 m ³
512	216	pied de chambre cube	39.085 dm ³

Other reported measures:

1 **moule** (for firewood in Rhône) = 1.843 m³.

43.27.4 Units of Dry Capacity

For cereals at Belleville and Montmerle-sur-Saône

		Metric
ânée or asnée		255.76 L
17	measure	15.045 L

For wheat, oats, rye and other cereals in Chaméry

			Metric	Metric	Metric
veissel			81.260 L	143.400 L	76.480 L
4	quartan		20.315 L	35.850 L	19.120 L
16	4	modurier	5.078 75 L	8.962 5 L	4.780 L

Three reported scales for cereals in Lyon

						Metric	Metric	Metric
ânée						206.544 L	205.663 621 L	191.82 L
6	bichet					34.424 L	34.277 270 L	31.97 L
12	2	demi-bichet				17.212 L	17.138 635 L	15.985 L
24	4	2	coupe			8.606 L	8.569 317 L	7.993 L
48	8	4	2	octave		4.303 L	4.284 659 L	3.996 L
96	16	8	4	2	picotin	2.151 5 L	2.142 329 L	1.998 L

For cereals at Savoie

				Metric
sacco				114.952 L
5	emmini			22.990 L
10	2	quartieri		11.495 L
40	8	4	coupé	2.873 8 L

For salt at Savoie

				Metric
muid				208.6 L
12	setier			17.38 L
18	1½	minot		11.59 L
192	16	10⅔	boisseaux	1.086 L

Other reported measures:

1 **asnée** (at Marnand) = 214.83 L;

1 **benne** (for coal in Lyon) = 74.07 L;

1 **benne** (for lime in Lyon) = 40 L.

43.27.5 Units of Liquid Capacity

For wine in Chaméry

				Metric
setier				89.184 L
48	pot ^a			1.858 L
96	2	moitié pot		929 mL
192	4	2	trimestre pot	464.5 mL

^aFor oil = 2.228 L

Two reported scales for wine in Lyon

							Metric	Metric
botte							372.520 L	327.823 864 L
4	année						93.130 L	81.955 966 L
8	2	barral					46.565 L	40.977 983 L
16	4	2	quarte				23.283 L	20.488 991 L
176	44	22	11	symaise			2.117 L	1.862 636 L
352	88	44	22	2	pot		1.058 L	931.318 mL
704	176	88	44	4	2	chopine or feuillette	529.15 mL	465.659 mL

For oil in Lyon (measured by weight)

			Metric
quarte			10.047 36 kg
6	lampe		1.674 56 kg
24	4	quarteron	418.64 g

43.27.6 Units of Weight

In Chaméry

							Metric
quintal							41.861 000 kg
100	livre						418.610 g
1600	16	once					26.163 125 g
12,800	128	8	gros				3.270 391 g
38,400	384	24	3	denier or scrupule			1.090 130 g
768,000	7680	480	60	20	grain		54.506 mg

In Lyon, based on [MART3]

			Metric
quintal			41.875 700 kg
100	livre		418.757 g
1600	16	once	26.172 g

For silk in Lyon, based on [MART3]

		Metric
livre		458.911 g
15	once	28.682 g

For gold and silver in Lyon, based on [MART3]

			Metric
livre			489.505 847 g
2	marc		244.752 923 g
16	8	once	30.594 115 g

Other reported measures:

1 **charge** (for coal in Lyon) = 400 livres = 167.5 kg.

43.28 Upper Normandy

43.28.1 Units of Length

1 **aune** (in Le Havre) = 1.186 515 m.

43.28.2 Units of Volume

For timber in Le Havre

		Metric
marque		77.160 dm ³
300	cheville	257.2 cm ³

43.28.3 Units of Dry Capacity

In Le Havre

		Metric
sac		207.448 860 L
6	boisseaux	34.574 810 L

For wheat at Rouen

				Metric	Metric
muid					2184 L
12	setier			280 poids de marc	182 L
24	2	mine			91 L
96	8	4	boisseaux		22.75 L

43.28.4 Units of Liquid Capacity

1 **velte** (in Le Havre) = 7.102 570 L.

43.28.5 Units of Weight

1 **livre** (in Le Havre) = 520.357 g.

44 Frederiksøerne

See *Nicobar Islands*.

45 French Antilles

See *French West Indies*.

46 French Cameroun

See *Cameroon*.

47 French Colony of Oceania

See *French Polynesia*.

48 French East India

The French East India Company was founded in 1664 to compete with the British and Dutch East

India companies in India. Between 1666 and 1721, French settlements were established at Arcot, Mahé (from 1725), Surat, Pondicherry (from 1674), Karikal, Matara, Trincomalee, Machilipatnam, Chinsura, Yanam (from 1723), Murshidabad, Chandernagore (from 1673), Balasore, and Calicut (present-day Kozhikode). Calicut, Surat and Machilipatnam were ceded to India in 1947, and Chandernagore in 1950. In 1954, Mahé, Karikal, Yanam and Pondicherry became the Union Territory of Pondicherry and were transferred to India. At that point, French East India practically ceased to exist.

In 1968, the Pondicherry Weights and Measures Enforcement Rules were brought into force, replacing the Madras Weights and Measures Rules in force until then.

Main sources: [BAUE], [KELL], and [MART3]

48.1 Currency

1892–:	1 Pondicherry star-pagoda = 28 fanoms or fanams 1 Pondicherry rupee = 8 fanoms = 144 cach or caches = 180 duodous
1871–1892:	1 Pondicherry pagoda = 24 fanoms = 1440 cash
c.1720–1871:	1 French Indian rupee = 8 fanoms = 24 doudous = 160 kāsus or cashes 1 French Indian pagoda = 3½ rupies
1693–1699:	1 Negapatnam pagoda = 24 fanams

48.2 Units of Quantity

For betel leaves

		Metric
souroutout		3000 leaves
62½	adoucou	48 leaves

Other reported measures:

- 1 **avanom** (for areca nuts) = 2000;
1 **courge** (for various commodities in Pondicherry) = 20.

48.3 Units of Length

In Pondicherry

										Metric
cadam										12,473.760 000 m
3	curosam									4157.920 000 m
7½	2½	nagi								1663.168 000 m
15	5	2	cupuduturam							831.584 000 m
6000	2000	800	400	vilcadé						2.078 960 m
12,000	4000	1600	800	2	astame					1.039 480 m
24,000	8000	3200	1600	4	2	hâth				519.740 mm
48,000	16,000	6400	3200	8	4	2	adi			259.870 mm
576,000	192,000	76,800	38,400	96	48	24	12	angoulam		21.656 mm
6,912,000	2,304,000	921,600	460,800	1152	576	288	144	12	noulam	1.805 mm

Other reported measures:

1 **côle**, **bân**, or **bamboo** (for surveying in Pondicherry) = 3.647 670 m;

1 **aune** = 1.188 446 m;

1 **yard** = 914.392 mm.

48.4 Units of Area

Traditional system in Pondicherry

				Metric
carré				79,832.978 6 m ²
3	vély			26,610.992 9 m ³
60	20	canis or mas		1330.549 6 m ²
600	200	10	cougi	133.054 96 m ²

British Imperial-linked system in Pondicherry

			Acre	Metric
putty			8	32,374.88 m ²
8	akaram		1	4046.86 m ²
80	10	kuncham	1/10	404.69 m ²

48.5 Units of Volume

In Pondicherry

		Metric
cougi		12.000 m ³
12	mètre cube	1.000 m ³

48.6 Units of Dry Capacity

For cereals

							Metric
garce							4486.875 000 L
62½	canam						71.790 000 L
125	2	gallon					35.895 000 L
1500	24	12	marcal				2.991 250 L
3000	48	24	2	pacca			1.495 625 L
6000	96	48	4	2	padi		747.812 mL
48,000	768	384	32	16	8	magani	93.477 mL

In Pondicherry, based on [KELL]

		Metric
garce		366.362 L
600	mercal	610.6 mL

For oil seed

		Metric
canam		71.790 000 L
24	marcal	2.991 250 L

For cereals

		Metric
canam		74.781 250 L
25	marcal	2.991 250 L

Other reported measures:

1 **cougi** (for various dry commodities) = 12,000 L;

1 **garce** (for salt in Karikal and Pondercherry) = 9000 livres des poids de marc = 4405.552 2 kg;

1 **garce** (for salt in Yanaon) = 4500 livres des poids de marc = 2202.776 1 kg.

48.7 Units of Liquid Capacity

In Pondicherry

					Metric
lègre					558.790 909 L
75	velte				7.450 545 L
600	8	pot			931.318 mL
1200	16	2	serre		465.659 mL
6000	80	10	5	dram	93.132 mL

For oil and melted butter

		Metric
doba^a		47.883 488 L
16	marcala	2.991 250 L

^aOften reported as 47.860 L when used for oil

For milk

		Metric
serre		465.656 mL
8	magani	58.207 mL

Other reported measures:

1 **lègre** = 533.4 – 571.5 L.

48.8 Units of Weight

Traditional and British Imperial-linked system for sugar and drugs in Pondicherry

			Metric	Metric
barre or candi			234.962 790 kg	226.796 326 kg
20	taulam or maund		11.748 139 kg	11.339 816 kg
160	8	vis	1.468 52 kg	1.417 477 kg

During the late nineteenth century

			Metric
barre or candi			226.750 000 kg
20	taulam or maund		11.337 500 kg
160	8	vis	1.417 187 kg

Customary system in Pondicherry

						Metric
touque or took						1.699 650 kg
$1\frac{9}{16}$	kuncham					1.087 776 kg
$6\frac{1}{4}$	4	serre, seer, or seyra				271.944 g
$12\frac{1}{2}$	8	2	tava			135.972 g
25	16	4	2	sola		67.986 g
50	32	8	4	2	palam or palom	33.993 g

In Pondicherry during the late nineteenth century

			Metric
touque or took			1.744 031 kg
$6\frac{1}{4}$	serre, seer, or seyra		279.045 g
50	8	palam or palom	34.881 g

British Imperial-linked system in Karaikal

					Metric
thooku					1.860 kg
4	rathal				453.41 g
$159\frac{1}{2}$	—	thola			11.662 g
$3\,444\frac{1}{4}$	—	—	varaganedai		540.0 mg
$16,666\frac{2}{3}$	—	—	—	kundumani	111.6 mg

British Imperial-linked system for grains, sugar and vegetables in Mahé

							Metric
ton							1016.136 kg
20	shatathookan						50.808 kg
70	$3\frac{1}{2}$	tulam					14.516 kg
2240	112	32	rathal				453.632 g
8960	448	128	4	palam			113.408 g
35,840	1792	512	16	4	ounce		28.352 g
573,440	28,672	8192	256	64	16	dram	1.772 g

Metric-linked system in Karaikal

		Metric
Kundu		25 kg
$16\frac{1}{2}$	veesai	1.50 kg

Other reported measures during the early twentieth century:

1 **candi** (for oil) = 240 kg;

1 **sac** (for pearls) = $266\frac{2}{3}$ seers = 74.381 kg;

1 **touque** = 1.770 kg;

1 **rattli** = 500 g;

1 **livre** = 496 g.

Monetary weights in Pondicherry (two reported scales)

				Metric	Metric
roupie				11.412 g	11.448 g
$3\frac{1}{3}$	pagode			3.423 6 g	3.434 4 g
30	9	fanam		380.4 mg	381.6 mg
480	144	16	nallo or nello	23.78 mg	23.85 g

Old and metric-linked system for pearls

			Metric	Metric
touque			1.699 65 kg	–
12	calanchi		141.637 g	140 g
240	20	manchadi	7.082 g	7 g

For gold and silver

				Metric
palom ^a				33.993 000 g
10	viraganidé			3.399 300 g
100	10	panavadé		339.930 mg
1600	160	16	nelli	21.246 mg

^aAlso reported as 35.70 g

49 French Equatorial Africa

See also *Central African Republic, Chad, Congo and Gabon*.

In 1910, the four french colonies in Africa were joined to form French Equatorial Africa. The dependencies were changed, during 1946, from colonies to territories within the French Union.

50 French Guiana

The trading post of Cayenne was founded in 1635, and French Guiana became a French Colony in 1674. The British and Portuguese briefly held French Guiana from 1805 to 1814. It was part of Guadeloupe until 1820, and has been a French overseas departement since 1946.

The metric system has been official since 1840. Before metrification, the old weights and measures used in Paris were in general use.

Main source: [BAUE]

50.1 Currency

1821–: 1 franc = 100 centimes
1814–1821: 1 livre colonial = 20 sous = 240 deniers

51 French Guinea

See *Guinea*.

52 French India

See *French East India*.

53 French Indochina

See also *Annam, Cambodia, Laos, Paracel Islands, and Vietnam*.

From 1887 until 1954, this was a federation of the three Vietnamese regions, Tonkin (North), Annam (Central), and Cochinchina (South), as well as Cambodia and Laos. The dependencies were changed from colonies to territories within the French Union in 1946.

53.1 Currency

1887–1952: 1 piastre de commerce = 100 cents
= 500 sapeques

53.2 Units of Length

1 môit thouc = 1 m.

53.3 Units of Capacity

Metric-linked system

		Metric
vuông môit gis		40 L
40	vuông môit bat tây	1 L

53.4 Units of Weight

System used during the early twentieth century and metric-linked system

			Metric	Metric
担			60.48 kg	60 kg
picul			1.008 kg	1 kg
60	môit cân tây		1.008 g	1 g
60,000	1000	môit đông cân tây		

54 French Oceania

See *French Polynesia*.

55 French Polynesia [Formerly: French Colony of Oceania]

The French Colony of Oceania included, most notably, the Islands of Society (the most famous of which is Tahiti), as well as the Marqueses Islands, Tuamotu, Tubai, Borabora, Ra'iatea, Taha'a and Huahine. The islands were claimed by France in 1768. The Marqueses Islands were ceded to France in 1842, and the Society Islands in 1880. The islands became an overseas territory in 1946 and were formally renamed French Polynesia in 1957.

The British system for weights and measures was used legally until 1842, when the system of Paris was adopted. The metric system has been official since 1842, and compulsory since 1880.

55.1 Currency

1945– : 1 CFP franc = 100 centimes
1903–1945: 1 French franc = 100 centimes

55.2 Units of Weight

1 *tonnellata* (before 1842) = 1016.047 542 kg.

56 French Somaliland

See *Djibouti*.

57 French Southern and Antarctic Lands

See *Antarctica*.

58 French Sudan

See *Mali*.

59 French Territory of the Afars and Issas

See *Djibouti*.

60 French West Africa

See also *Dahomey*, *French Guinea*, *French Sudan*, *Ivory Coast*, *Mauritius*, *Niger*, *Senegal*, *Togo*, and *Upper Volta*.

This union was formed in 1895 by grouping Dahomey, French Guinea, French Sudan, the Ivory Coast, Mauritius, Niger, Senegal, Upper Volta, and later on, the area of Togo.

60.1 Currency

1 unit = 5 francs = 500 centimes

61 French West Indies or French Antilles

See also *Guadeloupe* and *Martinique*.

This includes the overseas departments of Guadeloupe and Martinique, and the overseas collectivities of Saint Martin and Saint-Barthélemy. It previously also included Dominica, Grenada, the Grenadines, Saint Croix, Saint Kitts, Saint Lucia, Saint Vincent, and Tobago.

The metric system has been used since the late nineteenth century.

61.1 Units of Area

1 *carré* = 122,500 pieds carrés de Paris = 12,926.28 m².

61.2 Units of Liquid Capacity

For wine (usually)

							Metric
gallon ^a							3.785 2 L
2	pot or pottle						1.892 6 L
4	2	pinte					946.3 mL
8	4	2	chopine				473.15 mL
16	8	4	2	roquille			236.575 mL
32	16	8	4	2	muce		118.288 mL
64	32	16	8	4	2	demi-muce	59.144 mL

^aBased on the English wine gallon

61.3 Units of Weight

Logwood was sold in bulk loads of 500 kg.
Refined sugar was sold 50 kg per sack.
Rice, sugar, pasta, cheese, soap, cacao and coffee
were sold in loads of 1 kg, while cotton was
sold in loads of 500 g.

administered by French naval officers between
1843 and 1886. Gabon was part of the French
Congo from 1886 until 1904, when it was
reestablished as a separate territory. In 1910,
Gabon became one of the four territories of
French Equatorial Africa, and in 1946, an over-
seas territory of France. In 1960, Gabon gained
its independence.

The metric system has been official since
1884, and compulsory since 1907.

Main sources: [COMP], [MART3], and
[UN66]

62 Friendly Islands

See *Tonga*.

63 Fujairah

See *United Arab Emirates*.
Al-Fujairah was one of the original members
of the United Arab Emirates.

64.1 Currency

1960–: 1 CFA franc =
100 centimes
1941–1960: 1 French Equatorial African
franc = 100 centimes
1910–1941: 1 French West African
franc = 100 centimes
Sixteenth to nine- 1 conus (shell)
teenth centuries:

64 Gabon [Formerly: Gabão]

See also *French Equatorial Africa*.
This area was called Gabão by the Portuguese
sailors who first visited the mouth of the Como
River. At first, this name was applied to the
harbour, but it was soon extended to the rest of
the surrounding country. France gained sover-
eignty over Gabon in 1842. The area was

64.2 Units of Length

Some reported measures:

1 coudée or covado = 577.50 mm.
1 yarda (for fabrics) = 0.914 39 m.

64.3Units of Weight

Osua-scale for gold

							Metric
pareguab							717.40 g
2	pereguan-num						358.70 g
4	2	ntanu-asoanu					177.20 g
5	2½	1¼	ntanu				143.48 g
10	5	2½	2	pereguan			71.74 g
13⅓	6⅓	3⅓	2⅔	1⅓	asuasa		53.40 g
20	10	5	4	2	1½	asuanu or esuanu	35.60 g
40	20	10	8	4	3	2osua	17.80 g

Kokwa-scale for gold

						Metric
suru						~8.80 g
2	nsoansa					~4.48 g
4	2	nsoansafa				~2.26 g
8	4	2	ntaku-anum			~1.12 g
32	16	8	4	nkokwa-mienu		~280 mg
64	32	16	8	2	kokwa (the seed from abrus precatorius)	~140 mg

65Galicia

See *Spain*.

The Kingdom of Galicia existed between 409 and 1833, when the area became an administrative area of Spain.

also used in Krakow from 1802 until 1836, when it was replaced by the Krakow system. In 1857, the Austro-Hungarian system was introduced into the area.

Main sources: [HIMK] and [ROTT2]

66.1Units of Length

66Galicia and Lodomeria

See *Austria, Poland, and Ukraine*.

This area was a kingdom dependent on the Habsburg Monarchy, the Austrian Empire and Austria-Hungary from 1772 until 1918. Today, the area is divided between Poland and Ukraine.

After 1787, the Galician system for weights and measures was used in Lviv and the surrounding areas, and in 1801, the system was introduced throughout Galicia. This system was

		Metric
łokieć galicyjski		599.4 mm
2	stopa	297.7 mm

At Drniš, Knin and Šibonik

dokučiti			
1⅓	passo		
6	5	Fuss	
12	10	2	quarte

In Kraków before 1819, after 1819 and after 1855

							Metric	Metric	Metric
sznur							44.666 m	53.460 m	44.700 15 m
10	pret						4.466 m	5.346 m	4.470 015 m
25	2½	sążeń or sazem					1.786.6 m	2.138 40 m	1.788 006 m
100	10	4	precik				446.66 mm	534.6 mm	447.001 mm
150	15	6	1½	stópa			297.77 mm	356.4 mm	298.001 mm
1000	100	40	10	6⅔	lawek		44.666 mm	53.46 mm	44.700 mm
1800	180	72	18	12	1⅘	cal	24.814 mm	29.70 mm	24.833 mm
21,600	2160	864	216	144	21⅓	12 linia	2.068 mm	2.47 mm	2.069 mm

At Lviv after 1756

				Metric
pret				4.454 462 m
7½	precik or Elle^a			593.928 32 mm
15	2	Stopa or Fuss^b		296.964 16 mm
180	24	12	cal	24.747 01 mm

^a[MART3] reported it as 593.930 mm

^b[MART3] reported it as 296.965 mm

Some other reported measures:

- 1 **grosse Arschin** (in Brody) = 729.99 mm;
- 1 **kleine Arschin** (in Brody) = 676.9 mm;
- 1 **Elle** (in Kraków) = 616.970 mm (before 1836), 583.168 5 mm (after 1836) and 596.006 mm (after 1855);
- 1 **Elle** (“Galizische Elle,” before 1855) = 593.883 mm;
- 1 **pied** (in Kraków) = 356.4 mm.

66.2 Units of Area

At Lviv before 1857

		Metric
morgoro		5598.720 m ²
3	schnur	1866.240 m ²

66.3 Units of Dry Capacity

In Kraków before 1819 and after 1819

							Metric	Metric
laszt							3690 L	3525 L
15	kloda or chetvert						246 L	235.0 L
30	2	korzec					123 L	117.5 L
120	8	4	cwierc or ćwiertnia				30.75 L	29.38 L
960	64	32	8	garniec			3.844 L	3.67 L
3840	256	128	32	4	kwarta		960.9 mL	918 mL
15,360	1024	512	128	16	4	kwarterka	240.2 mL	229.5 mL

In Kraków and Lviv after 1836; in Lviv after 1855; in Lviv during the late nineteenth century, based on [MART3]; and in Kraków after 1855

						Metric	Metric	Metric	Metric
laszt						3689.209 2 L	3691.477 8 L	3690.000 L	3690.057 6 L
30	korzec					122.973 64 L	123.049 26 L	123.000 L	123.001 92 L
120	4	cwierzi				30.743 41 L	30.762 31 L	30.750 L	30.750 48 L
960	32	8	garniec			3.842 926 25 L	3.845 289 37 L	3.843 750 L	3.843 810 L
3840	128	32	4	kwart		960.731 56 mL	961.322 34 mL	960.937 mL	960.952 5 mL
15,360	512	128	16	4	kwartarek	240.182 89 mL	240.330 59 mL	240.234 mL	240.238 1 mL

66.4 Units of Liquid Capacity

In Kraków before 1836 and after 1836

						Metric	Metric
stargiew						273.12 L	276.75 L
2	beczka					136.56 L	138.375 L
72	36	garniec				3.793 L	3.843 75 L
288	144	4	kwarta			948.3 mL	960.94 mL
1152	576	16	4	kwaterek		237.1 mL	240.23 mL

In Kraków after 1855

		Metric
Fass		138.377 08 L
144	Quart	960.951 9 mL

In Lviv after 1836

						Metric
stargiew						276.750 L
2	beczka					138.375 L
72	36	garniec				3.843 750 L
288	144	4	kwart			960.937 5 mL
1152	576	16	4	kwartarek		240.234 4 mL

In Lviv between 1855 and 1857

		Metric
Fass		138.430 84 L
144	Quart	961.325 3 mL

66.5 Units of Weight

		Metric
cetnar		40.5 kg
100	funt	405 g

In Kraków in the fourteenth century, early sixteenth century, after 1558 and after 1650

								Metric	Metric	Metric	Metric
grzywna								196.26 g	197.684 g	201.802 g	201.86 g
4	wiardedunek							49.065 g	49.421 g	50.450 g	50.465 g
8	2	ounce						24.532 g	24.710 g	25.225 g	25.232 g
16	4	2	dram					12.266 g	12.355 g	12.613 g	12.616 g
24	6	3	1½	skojec				8.177 g	8.236 g	8.408 g	8.411 g
96	24	12	6	4	grain			2.044 g	2.059 g	2.102 g	2.103 g
240	60	30	9	6	2½	denari		817.75 mg	823.68 mg	840.84 mg	841.08 mg
480	120	60	18	12	6	2	obol	408.87 mg	411.84 mg	420.42 mg	420.54 mg

Upper scale in Kraków before 1819

						Metric
cetnar						40.550 4 kg
4	kamień					10.137 6 kg
4½	1½	leep				9.732 1 kg
5	1¼	1½	Stein			8.110 1 kg
100	25	24	20	funt		405.504 g
1600	400	384	320	16	uncja	25.344 g

Lower scale in Kraków before 1819

					Metric
uncja					25.344 g
2	lut				12.672 g
8	4	drachma			3.168 g
24	12	3	skrupul		1.056 g
576	288	72	24	granow	44 mg

For medical use in Kraków before 1857

					Metric
funt					357.853 8 g
12	uncja				29.821 1 g
96	8	drachme			3.727 6 g
288	24	3	skrupul		1.242 5 g
5760	480	60	20	granik	62.1 mg

For medical use in Lviv before 1857

			Metric
Pfund			420.009 g
32	Loth		13.125 g
128	4	Quentche	3.281 g

Some other reported measures:

1 **pound** (for grain) = 16.380 kg;

1 **Pfund** or **funt** (in Brody) = 560.012 g, 417.616 g or 409.517 g;

1 **funt** (in Lviv) = 420.048 g, but [MART3] reported it as 420.045 g;

1 **funt** = 405.024 19 g.

67 Galicia–Volhynia

See *Galicia and Lodomeria and Poland*.

Galicia–Volhynia was a kingdom that lasted from 1199 until 1349. Poland annexed Galicia in

1349, and Galicia–Volhynia ceased to exist as an independent state.

68 The Gambia [Formerly: British Gambia]

See also *Mauritania*.

The Gambia was once part of the Ghana, Mali and Songhay Empires. The Portuguese reached the coast in 1445, and the British gained trading rights in the Gambia in 1588, making it their first African settlement. Between 1651 and 1661, some parts of the Gambia were under Courland’s rule. The British established Fort James in 1663, and the French established Albreda in 1681. The 1783 Treaty of Versailles reserved the Gambia River for Britain, though it allowed the French to maintain Albreda (which was ceded to Britain in 1856). The Gambia became a British colony in 1821. In 1889, France and Britain agreed that British sovereignty should extend as far as a cannon could shoot from a gunboat navigating the Gambia river, which determined the country’s shape and demarcated the boundaries between Gambia and Senegal. The area was divided into a colony (including the city of Banjul and the surrounding area) and a protectorate (the remainder of the territory). The Gambia became a single colonial entity in 1888 and a crown colony, named British Gambia, in 1889. In 1965, the Gambia was granted independence within the Commonwealth and became a republic in 1970.

The metric system has been compulsory since 1979.

Main sources: [MART3], [UN55], and [UN66]

68.1 Currency

- 1971–: 1 Gambian dalasi = 100 bututs
- 1968–1971: 1 Gambian pound = 20 shillings = 240 pence
- 1913–1968: 1 West African pound = 20 shillings = 240 pence

- Local names:
- 1 dalasi (Mandinka), daerem (Wollof) or mbuud’u (Fula) = 4 shillings;
 - 1 gannawalla (F), tala (M) or talalibarr (W) = 2 shillings;
 - 1 taransu (F, W) or taransso (M) = 1 shilling;
 - 1 nonkong (M) = 6 pence;
 - 1 nyata (F, M, W) = 3 pence;
 - 1 burey (F, M, W) = 1 penny;
 - 1913: 1 pound sterling = 20 shillings = 240 pence = 960 farthings

68.2 Units of Length

1 covado = 487.26 m.

68.3 Units of Capacity

Dry commodities and liquids were generally sold by weight.

For oil

		Metric
cru		36.147 664 L
8	gallon	4.518 458 L

68.4 Units of Weight

British Imperial-linked system for rubber

		Imperial	Metric
cantar		2158 lbs av	978.852 928 kg
5	gammelle		195.770 586 kg

For rice and wheat

			Metric
barrique			180 kg
2 ⁴ / ₇	matar		70 kg
102 ³⁰ / ₃₅	40	moule	1.75 kg

Other reported measures:

- 1 barrique (for lime) = 250 kg;
- 1 cantar (after metrification) = 100 kg;
- 1 load (for cocoa) = 60 Imp lbs = 27.2 kg.

**69 Eastern Ganga Empire
(1078–1434)**

See *India*.

**70 Western Ganga Dynasty
(c.350–c.999)**

See *India*.

71 Garhwal Kingdom

See also *India*.

This kingdom was founded in 888. In 1803, the area became part of Nepal. The Sugauli Treaty of 1815 restored the kingdom, which became part of the Punjab Hill States Agency of British India. In 1949, the state was acceded to the Union of India.

Main source: [WILS]

71.1 Units of Dry Capacity

1 *bísí* = 40 seers.

72 Kingdom of Garo

See also *Ethiopia*.

This kingdom was established in 1567, and lasted until 1883, when it was annexed by the Kingdom of Jimma.

73 Gaza Strip

Gaza was part of the British Mandate of Palestine after the Second World War. In 1948, the area was occupied by Egypt. After the Six-Day War of June 5–10, 1967, Israel occupied the area. Egypt later renounced all claims to the area.

73.1 Units of Area

1 *dūnam* = 1000 m².

73.2 Units of Dry Capacity

1 *dirara* = 398 L.

74 Republic of Genoa

See also *Italy*, *Ligurian Republic* and *Ottoman Empire*.

The Most Serene Republic of Genoa was an independent state from 1005 until 1815, when it was annexed to the Kingdom of Sardinia. In 1768, the Treaty of Versailles ceded Corsica to the Republic.

74.1 Currency

Fourteenth century: 1 *Genovino d'oro* = 25 *soldi*
1252–: 1 *Genovino d'oro* = 4 *quartardo* = 8 *soldi*

75 Georgia [Formerly: Georgian Soviet Socialist Republic]

See also *Abkhazia*.

The Kingdom of Kartli-Kakheti was created in 1762 through the unification of two eastern Georgian kingdoms, which had existed independently since the disintegration of the united Georgian Kingdom in the fifteenth century. Kartli-Kakheti was incorporated into the Russian Empire in 1801, and the western part of present-day Georgia was annexed by Russia in 1810. Between 1828 and 1878, several territories were annexed to Georgia, such as Poti (1828), Akhaltsikhe (1829), Svaneti (1857), Abkhazia (1864) and Batumi (1878). The area subsequently became part of the Democratic Federative Republic of Transcaucasia, founded in 1918.

When Transcaucasia broke up, the independent Georgian Democratic Republic was founded in 1918. In 1922, Georgia became part of the Federative Union of Soviet Socialist Republics of Transcaucasia, which was a founding member of the USSR later that year. In 1936, Transcaucasia was split into three separate SSRs, including the Georgia SSR. Georgia declared its independence in 1991.

75.1 Currency

1995–:	1 Georgian lari = 100 tetri
1993–1995:	1 coupon = 100 kopeks
1924–1993:	1 Soviet ruble = 100 kopeks
1923–1924:	1 Transcaucasian ruble = 100 kopeks
1919–1923:	1 Georgian maneti = 100 kapeiki
1918–1919:	1 Transcaucasian maneti = 100 kapeiki
1833–1919:	1 Russian ruble = 100 kopeks
c.1750–1833:	1 Georgian abazi or abassi = 10 bisti = 40 pulis = 200 dinar

75.2 Units of Weight

At Tbilisi

			Metric
koda			32.760 9 kg
8%	liter		3.685 6 kg
80	9	funt	409.511 g

76 German East Africa

See *Tanzania*.

77 German New Guinea

See *Papua New Guinea*.

78 German Samoa

See *Samoa*.

79 German Southwest Africa

See also *Namibia*.

This area was a German colony from 1884 until 1915, when it was taken over by the Union of South Africa, and, as a league of Nations mandate, named South West Africa.

79.1 Currency

1884–1915: 1 German South West African
Mark = 100 Pfennig

80 Germany [Formerly: German Empire, German Republic, German Reich]

The state known as Germany was unified as a modern nation-state in 1871, when the German Empire was forged, with the Kingdom of Prussia as its largest constituent. Most of the measurement systems used among the following historically important states, grand duchies, duchies and Hanseatic cities are presented below: Anhalt, Baden, Bavaria, Brandenburg, Bremen, Brunswick, Frankfurt, Hamburg, Hanover, Hesse, Hesse-Cassel, Hesse-Homburg, Hesse-Nassau, Hohenzollern-Sigmaringen, Lippe(-Detmold), Lübeck, Mecklenburg-Schwerin, Mecklenburg-Strelitz, Nassau, Nuremberg, Oldenburg, Pomerania, Prussia, Reuss, Rhine, Saxe-Altenburg, Saxe-Coburg, Saxe-Meiningen(-Hildburghausen), Saxe-Weimar-Eisenach, Saxony, Schaumburg-Lippe, Schwarzburg, Waldeck and Pyrmont, Westphalia and Württemberg.

Nowadays, Germany comprises 16 states:
Baden-Württemberg, Bavaria, Berlin,
Brandenburg, Bremen, Hamburg, Hesse,

Mecklenburg-Vorpommern, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland, Saxony, Saxony-Anhalt, Schleswig-Holstein and Thuringia.

In earlier times, there was huge confusion regarding the measurement systems in Germany. For example, there were 112 different “Elles” and 123 different “Eimers” reported in 1800. The metric system has been official since 1871 and compulsory since 1872.

Main sources: [AUBÖ], [BRAN], [CHEL], [HASE], [KAHN], [ROCH2], [ROTT2], [SCHL], [WAGN2], [WITT], and [ZIEG]

80.1 Currency

1999–:	1 euro = 100 euro-cent
1990–1992:	1 German Mark = 100 Pfennig
1948–1990:	1 Mark or Ostmark = 100 Pfennig (in Eastern Germany)
1948–1990:	1 German Mark = 100 Pfennig (in the Federal Republic of Germany)
1924–1948:	1 German Reichmark = 100 Reichpfennig
1923–1924:	1 German Rentenmark = 100 Rentenpfennig
1914–1923:	1 German Papiermark = 100 Pfennig
1873–1914:	1 German Goldmark = 100 Pfennig

80.2 Units of Quantity

1 **Haufe** (for Turf) = 6 grosse Masskörbe = 240 Masskörbe = 6000;

1 **Last** (for smoked herring) = 20 Stroh = 2500;

1 **Grostaussend** = 1200;

1 **Last** (for herring) = 12 Tonnen = 800;

1 **Flässchen** (for plates) = 450;

1 **Flässchen** (for plates in Hamburg) = 300;

1 **Ring** = 2 Groshundenderten = 240;

1 **Zahl** = 60 Würf = 240;

1 **Bausch**, **Bauscht**, **Buscht**, or **Bust** (for paper) = 181 sheets;

1 **Gros** = 12 Dutzend = 144;

1 **Stroh** (for smoked herring) = 125;

1 **Groshundert** = 120;

1 **Hundert** (for smoke-ware) = 104;

1 **kleines Hundert** = 100;

1 **Großschock** = 64;

1 **Dekade** = 10.

For general use

Schock					60
1½	Zimmer				40
2	1⅓	Band or Bund			30
4	2⅔	2	Mandel or Malter		15
6	4	3	1½	Decher	10

In Fulda

Decher				10
2		Polst		5

For dried fish in Northern Germany

Kiepe				80
4		Stiege		20

For flocs in Northern Germany

Kiepe				600
30		Stiege		20

For writing paper (Schreibpapieren) before January 1, 1876

Ball				4800
10	Ries			480
200	20	Buch		24
4800	480	24	Bogen	1

For printing paper (Druckpapieren) before January 1, 1876

Ball				5000
10	Ries			500
200	20	Buch		25
5000	500	25	Bogen	1

For writing and printing paper after January 1, 1876

Pack							150,000
15	Ball						10,000
150	10	Neuries^a					1000
1500	100	10	Neubuch				100
15,000	1000	100	10	Heft			10
30,000	2000	200	20	2	Lage		5
150,000	10,000	1000	100	10	5	Bogen	1

^aOften said to equal about 1 kg

80.3 Units of Length

Traditional system

							Metric
Klafter							1.69 m
1½	Staab or Aune						1.13 m
3	2	Elle					564 mm
6	4	2	Fuß or Halbelle				282 mm
72	48	24	12	Zoll			23.5 mm
864	576	288	144	12	Linie		1.96 mm
10,368	6912	3456	1728	144	12	Punkt	163 µm

During the late nineteenth century

							Metric
Rute							3.766 m
5 ^{3⁄51}	Stab						666.8 mm
12	2 ^{⁄8}	Fuß					313.8 mm
144	25½	12	Zoll^a				26.15 mm
3600	637½	300	25	Strich			1.046 mm

^aAlso used as a name for the Imperial inch

Metric upper scale after 1868 and 1871

								Metric
Myriameter								10,000 m
10	Kilometer or Meile^a							1000 m
100	10	Hektometer						100 m
1000	100	10	Decameter or Kette					10 m
10,000	1000	100	10	Meter or Stab				1 m
100,000	10,000	1000	100	10	Decimeter			100 mm
1,000,000	100,000	10,000	1000	100	10	Centimeter or Neuzoll		10 mm
10,000,000	1,000,000	100,000	10,000	1000	100	10	Millimeter or Strich	1 mm

^aIn Northern Germany, 1 **Meile** = 7500 Ketten = 7500 m, was legally accepted from August 17, 1868 until January 1, 1874

Some other reported measures:

- 1 **Bergelle** (used in mining, between 1831 and 1872) = 571.428 4 mm;
- 1 **Bergfuß** (used in mining, between 1831 and 1872) = 285.714 2 mm.

80.4 Units of Area

Metric system after 1868 and 1871

							Metric
Quadrat Kilometer							1,000,000 m ²
100	Hektar						10,000 m ²
10,000	100	Ar					100 m ²
1,000,000	10,000	100	Quadrat Meter				1 m ²
100,000,000	1,000,000	10,000	100	Quadrat Decimeter			1 dm ²
10,000,000,000	100,000,000	1,000,000	10,000	100	Quadrat Centimeter		1 cm ²
1,000,000,000,000	10,000,000,000	100,000,000	1,000,000	10,000	100	Quadrat Millimeter	1 mm ²

Other measures reported during the nineteenth century:

- 1 **Erbe** = 59,760 m²;
- 1 **Morgen** (established 1816) = 2550 m².

80.5 Units of Volume

Metric system after 1868 and 1871

				Metric
Kubikmeter or Kubikstab				1 m ³
1000	Kubik Decimeter			1 dm ³
1,000,000	1000	Kubik Centimeter		1 cm ³
1,000,000,000	1,000,000	1000	Kubik Millimeter	1 mm ³

Other measures reported during the late nineteenth century:

- 1 **Kummit** (for turf) = 4.28 m³;
- 1 **Brauermaß** (for firewood) = 8 Fuß × 8 Fuß × 1 Fuß 22 Zoll = about 1.52 – 2.75 m³;
- 1 **Bergfaden** or **Hudefaden** (for wood) = 6²/₁₅ Fuß × 6²/₁₅ Fuß × 1½ – 2 Fuß = about 1.34 – 1.79 m³;
- 1 **Raummeter** (for piled wood) = 1 m³.

80.6 Units of Dry Capacity

Metric-linked system between 1868 and 1871

		Metric
Fass or Hektoliter		100 L
2	Scheffel	50 L

Other measures reported during the nineteenth century:

- 1 **grosser Hunt** (used in mining) = 197 L;
- 1 **mittlerer Hunt** (used in mining) = 131 L;
- 1 **kleiner Hunt** (used in mining) = 98.6 L.

80.8 Units of Weight

Presumed system during the late Roman Era

			Metric
Mina			436.224 g
1⅓	Libra		327.168 g
16	12	Unze	27.264 g

80.7 Units of Liquid Capacity

Traditional system

								Metric
Fuder								824.4 L
4	Oxhoft							206.1 L
6	1½	Ahm						137.4 L
12	3	2	Eimer or Aimer					68.70 L
24	6	4	2	Anker				34.35 L
480	120	80	40	20	Kanne			1.718 L
960	240	160	80	40	2	Maß		859 mL
1920	480	320	160	80	4	2	Schoppen	429 mL
3840	960	640	320	160	8	4	2	Ort 215 mL

For fermented wine

		Metric
Ahm		143.44 L
80	Altmaß	1.793 L

Other measures reported during the eighteenth and nineteenth centuries:

1 **Amschen** (for wine; a small barrel) = generally considered as about 6¼ Imp gal = about 28.41 L. According to [NORD2, p. 27], equal to 28.5 L, and [KRÜG, p. 3] reported it as 1/4 Ahm = about 32.8 L (in Berlin).

1 **Matrosenflasche** (name used for a Spanish demijohn by German seafarers) = about 11.3 L.

Metric-linked system between 1868 and 1871

				Metric
Kanne or Liter				1 L
2	Schoppe or Halbe Liter			500 mL
10	5	Deciliter		100 mL
100	50	10	Centiliter	10 mL

In the late eighth century, during the reign of Charlemagne

		Metric
pondus Caroli or Karlsfund		406.5 g
16	Unze	25.41 g

From the Middle Ages, the pound was the common weight throughout Europe, but it varied in size from city to city. Germany was no exception in this regard. Below is a scale that may have been most used in the inter-European trade.

Metric-linked system between 1868 and 1871

Tonne	Zentner									Metric
20										1000 kg
1000	50	Kilogramm								50 kg
2000	100	2								1 kg
100,000	5000	100	Pfund							500 g
1,000,000	50,000	1000	50	Neuloth						10 g
10,000,000	500,000	10,000	500	10	Gramm					1 g
100,000,000	5,000,000	100,000	5000	100	10	Decigramm				100 mg
1,000,000,000	50,000,000	1,000,000	50,000	1000	100	10	Centigramm			10 mg
			500,000	10,000	1000	100	10	Milligramm		1 mg

For medical use

Apotheker-Pfund ^a	Unze ^a	Loth ^a	Drachme	Skrupel	Obolus	Gran	Ass	Metric
12								357.854 g
24	2							29.821 g
96	8	4						14.911 g
288	24	12	3					3.728 g
576	48	24	6	2				1.243 g
5760	480	240	60	20	10			621.3 mg
6165	513¾	256⅞	64⅞ ³²	21⅞ ³²	10⅞ ⁶⁴	1⅞ ²⁸		58.05 mg

^aAccording to the scale of Nuremberg

Other measures reported during the nineteenth century:

1 **Kantje** (for herring) = 74 kg;

1 **Barrel** (for herring) = 100 kg.

For butter during the fourteenth to seventeenth centuries

		Metric
Stein		26.656 kg
8	Achtel ^a	3.332 kg

^aIn concept, the mass of butter that will occupy a Stübchen of 3.554 L

For flax before 1693

		Metric
Stein		10.206 kg
21	Markpfund	486 g

For flax after 1693

		Metric
Stein		9.720 kg
20	Pfund	486 g

For hemp, feathers, and wool during the fourteenth to nineteenth centuries

		Metric
Stein		4.86 kg
10	Markpfund	486 g

For lead during the fourteenth to nineteenth centuries

		Metric
Stein		26.719 kg
49	Pfund	545.3 g

80.9 Anhalt

Anhalt was part of the Duchy of Saxony until 1212. In 1252, the Principality of Anhalt was partitioned among the sons of Henry I into Anhalt-Aschersleben, Anhalt-Bernburg and Anhalt-Zerbst. When, in 1315, Henry's grandson Otto II died without producing any male heirs, the principality of Anhalt-Aschersleben was seized as a fief by his cousin, Bishop Albert of Halberstadt. In 1396, Anhalt-Zerbst was partitioned between Anhalt-Dessau and Anhalt-Köthen. After the

ruling family became extinct in 1468, Anhalt-Bernburg became part of Anhalt-Dessau. Prince Joachim Ernest of Anhalt-Zerbst unified all Anhalt lands under his rule in 1570. Anhalt was again divided in 1603, this time among Prince Joachim Ernest's sons, into Anhalt-Bernburg, Anhalt-Dessau, Anhalt-Köthen, Anhalt-Plötzkau, and Anhalt-Zerbst. After the last Duke of Anhalt-Bernburg died in 1863, all Anhalt states became united as the new duchy of Anhalt. When, in 1918, the Duke of Anhalt abdicated, it was the end of the Duchy of Anhalt, and the Free State of Anhalt was formed. At the end of World War II, Anhalt was merged with the Prussian Province of Saxony to form Saxony-Anhalt.

They used the same measurement systems as in Prussia, only with the exceptions listed below.

80.9.1 Currency

In Bernburg:

1841–1863 1 Anhalt-Bernburger Thaler = 30 Silbergroschen = 360 Pfennige

–1841: 1 Anhalt-Bernburger Thaler = 24 guten Groschen = 288 Pfennige

In Dessau:

1841–1857: 1 Dessau Thaler = 30 Silbergroschen = 360 Pfennige

–1841: 1 Dessau Thaler = 24 guten Groschen = 288 Pfennige

In Köthen:

1841–1857: 1 Köthen Thaler = 30 Silbergroschen = 360 Pfennige

80.9.2 Units of Length

In Dessau

		Metric
Lachter		2.041 000 m
7	Fuss	291.571 mm

Other reported measures:

1 **Elle** (in Anhalt-Köthen) = 635.900 mm;

1 **Fuss** (in Anhalt-Köthen) = 313.853 mm.

80.9.3 Units of Capacity

1 **Scheffel** (in Anhalt-Köthen) = 57.139 L.

1821–1829: 1 Baden Gulden = 60 Kreuzer

1753–1821: 1 Baden Gulden = 60 Kreuzer
landmünze

–1754: 1 Kronenthaler

80.9.4 Units of Weight

For medical use in Anhalt-Köthen

					Metric
Medicinal Pfund					349.832 000 g
12	Unze				29.152 667 g
96	8	Drachme			3.644 083 g
288	24	3	Skrupel		1.214 694 g
5760	480	60	20	Gran	60.735 mg

Some other reported measures:

1 **Pfund** (in Amhalt-Köthen) = 466.176 g.

80.10 Baden

The first known division of this territory occurred in 1190, when separate lines of margraves were established in Baden and Hachberg. In 1418, Hachberg was sold back to Baden. In 1515, Baden was divided into Baden-Pforzheim and Baden-Baden. In 1565, the margrave in Pforzheim moved his seat to Durlach, and the area was renamed Baden-Durlach. When the male line of Baden-Baden failed in 1771, Baden was once again reunited. Baden became a Grand Duchy in 1806, lasting until 1918. Since 1952, Baden has been a part of Baden-Württemberg.

The metric system became official on December 4, 1871 and July 9, 1873, and has been compulsory since January 1, 1874.

80.10.1 Currencies

1875–: 1 German Goldmark =
 100 Pfennig

1857–1871: 1 Vereinsthaler

1837–1874: 1 Baden Gulden = 60 Kreuzer =
 240 Pfennigen = 480 Hellern

1829–1837: 1 Baden Thaler = 100 Kreuzer =
 200 halbe Kreuzer = 400 viertel
 Kreutzer

80.10.2 Units of Length

In Baden before 1810

					Metric
Grad des Aequators					111,111.1 m
12½	Meile ^a				8888.9 m
25	2	Wegstunde ^b			4444.4 m
–	–	–	Elle		544.900 mm
–	–	–	–	Fuß	291.000 mm

^a1 Meile (between 1810 and 1871) = 2 Wegstunden = 8 km

^b2 Wegstunden was also reported as = 8890.7 m

In Stuttgart before 1810

		Metric
Ruthe		2.864 90 m
10	Württembergischer Fuss	286.490 mm

Metric-linked system after 1810

							Metric
Ruthe							3 m
1⅔	Klafter						1.8 m
5	3	Elle ^a					600 mm
10	6	2	Fuß				300 mm
100	60	20	10	Zoll			30 mm
1000	600	200	100	10	Linie		3 mm
10,000	6000	2000	1000	100	10	Punkt	300 µm

^aThe Elle was divided into ½ (Halbe), ¼ (Viertel), ⅛ (Achtel) and ⅙ (Sechszehntel)

Other reported measures:

- 1 Elle (in Mannheim) = 558.100 mm;
- 1 Fuss (in Mannheim) = 288.800 mm;
- 1 Fuss (in Heidelberg) = 278.500 mm.

80.10.3 Units of Area

Metric-linked upper scale used between 1810 and 1869

						Metric
Morgen						3600 m ²
4	Viertel					900 m ²
40	10	Riemrute				90 m ²
400	100	10	Quadratrute			9 m ²
1 111⅓	277⅓	27⅓	2⅓	Quadratklafter		3.24 m ²
10,000	2500	250	25	9	Quadratelle	36 dm ²

Metric-linked lower scale used between 1810 and 1869

					Metric
Quadratelle					36 dm ²
4	Quadratfuß				900 cm ²
400	100	Quadratzoll			9 cm ²
40,000	10,000	100	Quadratlinie		9 mm ²

80.10.4 Units of Volume

Before 1810

					Metric
Kubikschuh					23.328 m ³
6	Klafter (6 Fuß × 6 Fuß × 4 Fuß)				3.888 m ³
72	12	Balkenrute			324 dm ³
864	144	12	Kubikfuß		27 dm ³

After 1810

				Metric
Kubikrute				27,000 L
125	Kubikelle			216 L
1000	8	Kubikfuß		27 L
1,000,000	8000	1000	Kubikzoll	27 mL

Other reported measures after 1810:

- 1 Ster = 1 m³.

80.10.5 Units of Dry Capacity

For smooth fruits before 1810

		Metric
Malter		128.320 L
8	Simri	16.040 L

For raw fruits, dinkel and cereals in Mannheim before 1810, based on [MART3]

							Metric
Malter^a							124.965 000 L
1 $\frac{1}{8}$	Malter^b						111.080 000 L
4 $\frac{1}{2}$	4	Viernsel					27.770 000 L
9	8	2	Simri				13.885 000 L
18	16	4	2	Vierling			6.942 500 L
36	32	8	4	2	Invel		3.471 250 L
144	128	32	16	8	4	Mässchen	867.812 mL

^aFor barley and oats

^bFor wheat

Metric-linked system after 1810

							Metric
Zuber							1500 L
10	Malter^a						150 L
50	5	Doppel Sester^a					30 L
100	10	2	Sester^b				15 L
1000	100	20	10	Mässlein			1.5 L
10,000	1000	200	100	10	Becher		150 mL

^aThis was also used for charcoal

^bThis was also used for coal and lime, despite the fact that lime was also sold by weight

Other reported measures:

1 **Malter** (in Heidelberg) = 102.986 L.

80.10.6 Units of Liquid Capacity

In Heidelberg before 1810

							Metric
grosse Ahm							158.17 L
5 $\frac{1}{3}$	klein Ahm						94.94 L
20	12	Viertel					7.91 L
80	48	4	Eichmaß				1.978 L
90	54	4 $\frac{1}{2}$	9 $\frac{1}{8}$	Zapfmaß			1.757 L

In Mannheim before 1810, based on [MART3]

							Metric
grosse Ohm							159.520 000 L
5 $\frac{1}{3}$	kleine Ohm						95.712 000 L
20	12	Viertel					7.976 000 L
80	48	4	Maß				1.994 000 L
320	192	16	4	Schoppen			498.500 mL

Other reported measures:

1 **Schenkmaass** (for minute trading in Karlsruhe
before 1810) = 2.31 L;

1 **Maass** (in Heidelberg) = 2.30 L.

Metric-linked upper scale after 1810

						Metric
Fuder						1500 L
$1\frac{1}{4}$	Stückfaß					1200 L
$2\frac{1}{2}$	$3\frac{1}{8}$	Zulast or Stück Wein				600 L
10	$31\frac{1}{4}$	10	Ahm or Ohm			150 L
100	$312\frac{1}{2}$	100	10	Stütze		15 L
1000	3125	1000	100	10	Maß	1.5 L

Metric-linked lower scale after 1810

						Metric
Maß						1.5 L
$1\frac{1}{4}$	Liter					1 L
$3\frac{1}{3}$	$2\frac{2}{3}$	Schoppen				375 mL
10,000	$6\frac{2}{3}$	$2\frac{1}{2}$	Glas or Verre			150 mL
55,555 $\frac{5}{9}$	$37\frac{1}{27}$	$13\frac{8}{9}$	$5\frac{1}{9}$	Kubikzoll		27 mL

80.10.7 Units of Weight

Before 1810

						Metric
Zentner						48.597 120 kg
104	Pfund					467.280 g
208	2	Mark				233.640 g
1664	16	8	Unze			29.205 g
3328	32	1	2	Loth		14.602 5 g
13,312	128	64	8	4	Quentchen	3.650 6 g

Schaffhausen system, also used before 1810

						Metric
Centner Schwergewicht						57.496 500 kg
$1\frac{1}{4}$	Centner Leichgewicht					45.997 200 kg
100	80	Pfund Schwergewicht				574.965 g
125	100	$1\frac{1}{4}$	Pfund Leichgewicht			459.972 g
4000	3200	40	32	Loth		14.374 125 g

In Heidelberg before 1810, based on [MART3]

						Metric
Centner Schwergewicht						50.540 760 kg
–	Centner Leichgewicht					46.797 000 kg
100	–	Pfund Schwergewicht				505.408 g
108	100	$1\frac{7}{25}$	Pfund Leichgewicht			467.970 g
3456	3200	$34\frac{14}{25}$	32	Loth		14.624 g
13,824	12,800	$138\frac{6}{25}$	128	4	Quentchen	3.656 g

In Mannheim before 1810, based on [MART3]

			Metric
Centner			50.534 712 kg
100	schwere Pfund		505.347 g
108	$1\frac{7}{25}$	leichte Pfund	467.914 g

Metric-linked system used between 1810 and 1869

							Metric
Zentner							50 kg
10	Stein						5 kg
100	10	Pfund					500 g
1000	100	10	Zehnling				50 g
10,000	1000	100	10	Centas			5 g
100,000	10,000	1000	100	10	Pfennig or Dekas		500 mg
1,000,000	100,000	10,000	1000	100	10	As	50 mg

For gold, silver and jewels before 1810

								Metric
Mark								233.64 g
8	Unze							29.205 g
16	2	Loth						14.602 5 g
64	8	4	Quentchen					3.650 6 g
256	32	16	4	Pfennig				912.656 mg
10,240	1280	640	160	40	Karat			22.816 mg
40,960	5120	2560	640	160	4	Gran		5.704 mg
163,840	20,480	10,240	2560	640	16	4	Gränchen	1.426 mg

For gold, silver and jewels before 1831

										Metric
Pfund										
2	Mark									500 g
4	2	Vierling								250 g
16	8	4								125 g
64	32	16	Unze							31.25 g
128	64	32	8	Loth						7.812 5 g
512	256	128	32	2	Quentchen					3.906 25 g
2048	1024	512	128	8	4	Pfennig				976.562 5 mg
8192	4096	2048	512	32	16	4	Karat			244.140 6 mg
32,768	16,384	8192	2048	128	64	16	4	Grän		61.035 2 mg
131,072	65,536	32,768	8192	512	256	64	16	4	Gränchen	15.258 8 mg
			8192	2048	1024	256	64	16	4	Richttheil 3.814 7 mg

Money exchangers weight:

After 1857: 1 Pfund = 500 g (divided into 1000

Millesimi = 10,000 Ass);

After 1837: 1 Mark = 233.855 5 g;

Before 1837: 1 Mark = 233.640 g.

For medical use before 1854 and after 1854

					Metric	Metric
Medicinal Pfund					375.000 g	357.779 9 g
12	Unze				31.250 g	29.815 g
96	8	Drachme			3.906 25 g	3.727 g
288	24	3	Skrupel		1.302 08 g	1.242 g
5760	480	60	20	Grän	65.10 mg	62.11 mg

80.11 Bavaria

From 1180 to 1918, Bavaria was ruled by the House of Wittelsbach. From 1255 to 1503, the area lived through a period of several divisions into smaller individual duchies. Primogeniture was proclaimed in 1506, and in 1623, the dukes of Bavaria were given the electoral right of the Holy Roman Empire. After the death of the Bavarian elector Karl Theodor, Bavaria was reunited under Maximilian IV. Joseph, who became Duke of Bavaria. In 1806, Bavaria became a kingdom, and its area nearly doubled. Bavaria finally became part of Germany in 1949.

80.11.1 Currency

1837–1873: 1 Bavarian Gulden or Florin = 15 Batzen = 20 Kaysergroschen = 60 Kreuzer = 240 Pfennigen = 480 Heller

1753–1837: 1 Bavarian Gulden = 50 Conventionskreutzer = 60 Kreuzer Landmünze = 240 Pfennige = 480 Heller

80.11.2 Units of Length

In Augsburg before 1869

			Metric
Fuss			296.168 mm
12	Zoll		24.681 mm
144	12	Linie	2.056 7 mm

System used between 1869 and 1872

						Metric
Ruthe						2.918 592 06 m
5	Elle					583.718 412 mm
10	2	Fuß				291.859 206 mm
100	20	10	Decimalzoll			29.185 920 6 mm
1000	200	100	10	Decimallinie		2.918 592 06 mm
10,000	2000	1000	100	10	Skrupel	291.859 206 µm

Verkzoll system used before 1869

							Metric
Chaussée-meile or Chausemeile							7414.973 921 m
2	Wegstunde ^a						3707.486 960 m
4 234 $\frac{1}{3}$	2 117 $\frac{1}{6}$	Klafter					1.751 154 984 m
12,703	6 351 $\frac{1}{2}$	3	Elle				583.718 328 mm
25,406	12,703	6	2	Fuß ^b			291.859 164 mm
304,872	152,436	72	24	12	Verkzoll		24.321 597 mm
3,658,464	1,829,232	864	288	144	12	Verklinie	2.026 800 mm

^aIn use until 1846

^bThis length was measured at 13° Réaumur

For linen

				Metric
Buschen				
30	Strähn			1999.24 m
300	10	Gebinde or Schnelle		199.924 m
72,000	2400	240	Faden	833.017 mm

At Munich

									Metric
Chaussée Meile ^a									7414.974 834 m
2	Wegstunde								3707.487 418 m
2 540 $\frac{3}{5}$	1 270 $\frac{3}{10}$	Ruthe							2.918 592 m
–	–	–	Berglachter						1.970 050 m
–	–	–	–	Klafter					1.751 155 m
–	–	–	–	–	Elle				833.015 mm
25,406	12,703	10	6 $\frac{3}{4}$	6	2 $\frac{1}{48}$	Fuß			291.859 mm
304,872	152,436	120	81	72	34 $\frac{1}{4}$	12	Zoll		24.322 mm
3,658,464	1,829,232	1440	972	864	411	144	12	Linie	2.027 mm

^aLegally used until 1847. There was also 1 **geographische Meile** = 25,421 3/5 Fuss = 7419.527 839 m

For threads of cotton in Munich

				Metric
Spindel				
18	Strahn			13,825.603 895 m
126	7	Gebinde		768.089 105 m
10,080	560	80	Haspelfaden	109.727 015 m
				1.371 588 m

For threads of linen in Munich

				Metric
Buschen				
30	Strahn			59,977.065 600 m
300	10	Gebinde		1999.235 520 m
72,000	2400	240	Haspelfaden	199.923 552 m
				833.015 mm

At Onolzbach (present-day Ansbach)

		Metric
Ruthe		3.597 596 m
12	Fuß	299.799 7 mm

Other reported measures:

- 1 **Meile** = 25,406 Fuß = 7419.0 m;
 1 **Elle** (at Ratisbon, present-day Regensburg) = 811.000 mm;
 1 **Grosse Elle** or **Krämer-Elle** (long, at Augsburg) = 606.37 mm or 609.5 mm;
 1 **Kleine Elle** or **Barchent-Elle** (short, at Augsburg) = 586.52 mm or 592.3 mm;
 1 **Fuss** (at Ratisbon, present-day Regensburg) = 289.900 mm.

Some other reported measures:

- 1 **Pfanne Holz** (for timber in Hallstadt, in 1524) = 409.258 656 m³;
 1 **Klafter** (for firewood in Rhineland) = $6 \times 6 \times 4$ Fuß = 144 Kubikfuß = 3.579 996 m³;
 1 **Klafter** (for firewood) = $6 \times 6 \times 3\frac{1}{2}$ Fuß = 126 Kubikfuß = 3.132 496 m³;
 1 **Holzklafter** (for firewood in Salzbachkreis, = $6 \times 6 \times 3\frac{1}{2}$ Bavarian Fuss) = 3.132 486 m³;
 1 **Faden** or **Klafter** (for firewood at Anspach) = $5\frac{1}{2} \times 5\frac{1}{2} \times 3\frac{1}{2}$ Fuß = 103 $\frac{7}{8}$ Kubikfuß = 2.852 902 m³;
 1 **Klafter** (for firewood) = $6 \times 6 \times 1\frac{1}{2}$ Fuß = 54 Kubikfuß = 1.342 498 m³.

80.11.3 Units of Area

Traditional upper scale

				Metric
Jauchert, Joch, Morgen or Tagwerk				3407.270 9 m ²
100	Dezimale			34.072 709 m ²
400	4	Quadratrute		8.518 179 m ²
1111 $\frac{1}{9}$	11 $\frac{1}{9}$	2 $\frac{2}{9}$	Quadratklafter	3.066 544 m ²

traditional lower scale

				Metric
Quadratklafter				3.066 544 m ²
4	Beet			76.663 611 dm ²
36	9	Quadratfuß		8.518 179 dm ²
5184	1296	144	Quadratzoll	5.915 mm ²

Other reported measures:

- 1 **Hube** or **Hufe** = 33-42 Tagwerken.

80.11.4 Units of Volume

			Metric
Kubik Ruthe			24.861 090 m ³
–	Klafter		3.132 497 m ³
1000	126	Kubik Fuss	24.861 089 85 dm ³

80.11.5 Units of Dry Capacity

Traditional system after 1809

						Metric
Schaff						222.357 L
6	Metze					37.059 5 L
12	2	Viertel				18.529 8 L
48	8	4	Massel or Achtel			4.632 4 L
96	16	8	2	Maßlein		2.316 2 L
192	32	16	4	2	Dreissiger	1.158 1 L

For corn at Augsburg

					Metric
Schaff					440.40 L
8	Metze				55.05 L
32	4	Vierling			13.76 L
128	16	4	Maessel		3.44 L

For grain at Augsburg

					Metric
Schaff					205.267 L
8	Metze				25.658 375 L
32	4	Vierling			6.414 594 L
128	16	4	Viertel		1.603 648 L
512	64	16	4	Maessel	400.912 mL

For grain and oats at Donawert

		Metric	Metric
Schaff		241.41 L	415.57 L
18	Metzen	13.41 L	23.09 L

In Munich

									Metric
Muth									889.430 350 L
4	Schäffel								259.417 185 L
$4\frac{2}{3}$	$1\frac{1}{2}$	Schäffel							222.357 588 L
24	7	6	Metze						37.059 597 9 L
48	14	12	2	Viertel					18.529 799 L
56	28	24	4	2	Halbe Viertel				9.264 899 L
112	56	48	8	4	2	Maassl			4.632 450 L
224	112	96	16	8	4	2	Halbe Massl		2.316 225 L
448	224	192	32	16	8	4	2	Dreissiger	1.158 112 L

For grain at Neubourg

		Metric
Schaff		1116.39 L
24	Metzen	46.516 L

For grain at Passau

		Metric
Schaff		1915.60 L
6	Sechsling	319.27 L

At Ratisbon (present-day Regensburg), based on [MART3]

		Metric
Schaff		1049.780 000 L
4	Maess	262.445 000 L
28	8 Metzen	32.805 625 L

For wheat and oats at Würzburg

				Metric	Metric
Malter				172.98 L	267.24 L
2	Achtel			86.49 L	133.62 L
8	4	Metze		21.62 L	33.40 L
32	16	4	Viertel	5.41 L	8.35 L
128	64	16	4 Maeß	1.35 L	2.09 L

For oats at Ratisbon (present-day Regensburg)

				Metric
Schaff				1026.41 L
4	Maess			256.602 L
28	7	Vierling		36.657 L
56	14	2	Metzen	18.329 L

For grain at Ratisbon (present-day Regensburg)

				Metric
Schaff				586.52 L
4	Maess or Muth			146.63 L
16	4	Vierling		36.66 L
32	8	2	Metzen	18.33 L

For lime at Ratisbon (present-day Regensburg)

				Metric
Schaff				219.95 L
6	Vierling			36.658 L
12	2	Metzen		18.329 L

Other measures reported during the mid-nineteenth century:

- 1 **Schaff** (at Bad Abbach) = 1021.34 L (for oats) and 649.96 L (for grain in general);
- 1 **Schaff** (at Abensberg) = 928.48 L (for oats) and 742.79 L (for grain);
- 1 **Schaff** (at Denkendorf) = 501.38 L (for grain);
- 1 **Schaff** (at Ingolstadt) = 1033.65 L (for oats), 663.88 L (for barley), and 612.81 L (for wheat);
- 1 **Schaff** (at Kelheim) = 1123.21 L (for oats) and 687.09 L (for grain);
- 1 **Schaff** (at Landau an der Isar) = 742.77 L (for oats) and 334.26 L (for grain);

1 **Schaff** (at Landshut) = 909.91 L (for oats) and 603.52 L (for grain);

1 **Schaff** (at Mainburg) = 1067.69 L (for oats) and 619.77 L (for grain);

1 **Schaff** (at Rain) = 612.81 L (for oats), 557.10 L (for barley), and 529.25 L (for grain);

1 **Schaff** (at Straubing) = 623.93 L (for oats), 571.96 L (for barley), and 519.97 L (for grain);

1 **Schaff** (at Vilshofen an der Donau) = 973.41 L (for oats), 668.49 L (for barley), and 557.10 L (for grain).

80.11.6 Units of Liquid Capacity

Old scale for general use at Augsburg

		Metric
Maßkanne or Pot		1.068 L
8	Achtel	133.5 mL

New scale for general use at Augsburg

					Metric
Fuder					1135.50 L
8	Jee or Jetz				141.94 L
16	2	Muid			70.97 L
96	12	6	Beson		11.83 L
768	96	48	8	Masse	1.478 L

For wine at Augsburg

								Metric
Fuder-Wein								904.089 600 L
8	Jetz							113.011 200 L
16	2	Muid						56.505 600 L
768	96	48	Visirmaaß					1.177 200 L
864	108	54	1 $\frac{1}{8}$	Schenkmaaß				1.046 400 L
1536	192	96	2	1%	Seidel			588.600 mL
3072	384	192	4	3%	2	Quartel		294.300 mL
6144	768	384	8	7%	4	2	Achtel	147.150 mL

For beer in Munich before 1809

						Metric
Fass Bier						1642.025 262 L
24	Visir-Eimer					68.417 719 L
1536	64	Maasskanne				1.069 026 863 L
3072	128	2	Seidel			534.513 mL
6144	256	4	2	Schoppen		267.257 mL
12,288	512	8	4	2	Nösel	133.628 mL

For wine in Munich before 1809

							Metric
Fuder Wein							769.699 341 L
2	Ohm						128.283 224 L
24	12	Schenk-Eimer					64.141 612 L
1440	720	60	Schenkmaass				1.069 026 863 L
2880	1440	120	2	Seidel			534.513 mL
5760	2880	240	4	2	Schoppen		267.257 mL
11,520	5760	480	8	4	2	Nösel	133.628 mL

At Ratisbon (present-day Regensburg), based on [MART3]

		Metric
Eimer		113.632 000 L
32	Viertel	3.551 000 L

At Ratisbon (present-day Regensburg)

		Metric
Koepfel		832.8 mL
8	Achtel	104.1 mL

At Würzburg

				Metric
Eimer				74.902 L
8	Achtel			9.362 8 L
64	8	Truebaichmaß		1.179 3 L
72	9	1⅓	Hellaichmaß or Schenkmaß	1.040 L

Other reported measures:

1 **Kopfen** (in Ratisbon (present-day Regensburg)) = 1.289 L.

80.11.7 Units of Weight

Mercantile system used before 1811

					Metric
Zentner					49.087 400 kg
100	Pfund Schwergewicht				490.874 g
–	–	Pfund Leichtgewicht			472.423 g
3200	32	–	Loth		15.339 812 g
–	–	32	–	Loth	14.763 219 g

Mercantile system used between 1811 and 1833

						Metric
Zentner						56 kg
5	Stein					11.2 kg
100	20	Pfund				560 g
3200	640	32	Loth			17.5 g
12,800	2560	128	4	Quentchen		4.375 g
51,200	10,240	512	16	4	Pfennig	1.093 75 g

Mercantile system used between 1833 and 1872

				Metric
Zentner				50 kg
100	Zollpfund			500 g
3200	32	Loth		16.667 g
12,800	128	4	Quentchen	4.167 g

Other reported measures:

1 **Pfund** (at Ratisbon (present-day Regensburg)) = 568.679 g;
 1 **Zollpfund** (used for gold and silver) = 500 g;
 1 **Frohngewicht** (in Augsburg) = 492.037 g.

For gold and silver

							Metric
Mark							233.950 000 g
8	Unze						29.243 750 g
16	2	Loth					14.621 875 g
64	8	4	Quentchen				3.655 469 g
256	32	16	4	Pfennig			913.867 mg
512	64	32	8	2	Heller		456.934 mg
65,536	8192	4096	1024	256	128	Richtpfennig	3.570 mg

For silver in Augsburg

				Metric
Pfund				471.848 g
2	Mark			235.924 g
32	16	Loth		14.745 g
128	64	4	Quentchen	3.686 g

Other reported measures:

- 1 **Kronengewicht** (for gold and silver at Ratisbon (present-day Regensburg)) = 429.592 000 g;
- 1 **Silbergewicht** (for silver at Ratisbon (present-day Regensburg)) = 246.028 000 g;
- 1 **Dukatengewicht** (for gold and silver at Ratisbon (present-day Regensburg)) = 64 Dukaten = 223.387 600 g;
- 1 **Dukaten** (for fine use at Ratisbon (present-day Regensburg)) = 3.490 400 g.

Traditional and metric-linked system for medical use

					Metric	Metric
Apotheker Pfund					357.628 4 g	360 g
12	Unze				29.802 4 g	30 g
96	8	Drachme			3.725 296 g	3.75 g
288	24	3	Skrupel		1.241 765 g	1.25 g
5760	480	60	20	Gran	62.088 mg	62.5 mg

80.12 Berg

The Counts of Berg emerged in 1101 from the Kingdom of Lotharingia. The area split with the County of Mark in 1160. In 1368, it was united with the County of Cleves, and in 1521, with Jülich and Cleves as the United Duchies of Jülich-Cleves-Berg. In 1614, the Count Palatine

of Neuburg annexed Jülich and Berg, while the Elector of Brandenburg took control of Cleves and Mark. Napoleon established the area as the Grand Duchy of Berg in 1805. The area became part of Prussia in 1815.

80.12.1 Currency

1521–1614: 1 Plappert = 3 Stuber = 4 Albus
= 6 Fettmengen

80.13 Bremen (Freie Hansestadt Bremen)

In 787, Willehad of Bremen became the first Bishop of Bremen. In 1186, the first imperial privilege for the city was issued. The city entered the Hanseatic League in 1276. In 1646, Bremen

was raised to free imperial status. The area subsequently lost that status in 1803, but regained its independence in 1815. In 1871, it became a state in the Germany Empire.

80.13.1 Currencies

–1873: 1 Bremen Thaler = 72 Grote = 360 Schwaren

80.13.2 Units of Count

1 **Hunt** (for turf) = 6480;
 1 **Zahl** (for flatfish) = 110;
 1 **Zehning** (for skins) = 10.

80.13.3 Units of Length

Scale used between 1818 and 1870

						Metric
Ruthe^a						4.629 6 m
2 $\frac{2}{3}$	Klafter					1.736 1 m
8	3	Elle				578.7 mm
16	6	2	Fuß			289.35 mm
192	72	24	12	Zoll		24.112 5 mm
2304	864	288	144	12	Linie	2.009 4 mm

^a1 **Ruthe** (for surveying) = 20 Fuß = 5.787 m

For yarn

					Metric
Lop					1953.112 5 m
10	Gebinde				195.311 25 m
900	90	Faden			2.170 125 m
3375	337 $\frac{1}{2}$	3 $\frac{3}{4}$	Elle		578.70 mm

Other reported measures:

1 **brabanter Elle** = 694.44 mm.

80.13.4 Units of Area

Before 1870

						Metric
Morgen						2571.983 5 m ²
10	Viertel-Pfund Kohlsa					257.198 35 m ²
120	12	Quadratru				21.433 19 m ²
853 $\frac{1}{3}$	85 $\frac{1}{3}$	7 $\frac{1}{9}$	Quadratkla			3.014 042 m ²
30,720	3072	256	36	Quadratfuß		8.372 34 dm ²

80.13.5 Units of Volume

					Metric
Kubik Klafter					5.232 680 m ³
~2.135 79	Reif or Reep^a				2.45 m ³
3	~1.404 63	Faden^b			1.744 227 m ³
216	~101.134	72	Kubikfuß		24.225 37 dm ³

^aFor firewood

^bFor firewood (= 6 × 6 × 2 Fuß), but also reported as (6 × 6 × 2 $\frac{1}{2}$ Fuß) = 78 Kubikfuß

Other measures reported during the nineteenth century:

1 **Hunt** (for turf, before 1872) = 560 Kubikfuß = 13.566 21 m³;
1 **Hunt** (for turf, after 1872) = 12.0 m³.

80.13.6 Units of Dry Capacity

					Metric
Last					2964.154 8 L
4	Quart				741.038 7 L
40	10	Scheffel			74.103 87 L
160	40	4	Viertel		18.525 968 L
640	160	16	4	Spint	4.631 492 L

For general use

							Metric
Oxhhof							217.21 L
1½	Ohm						144.81 L
6	4	Anker					36.20 L
30	20	5	Viertel or Velte				7.24 L
67½	45	11¼	2¼	Stübchen			3.22 L
270	180	45	9	4	Quart		804.5 mL
1080	720	180	36	16	4	Mengel	201.12 mL

For French wines and spiritus

							Metric
Oxhhof ^a							223.516 363 L
1½	Ohm						149.010 909 L
6	4	Anker					37.252 727 L
30	20	5	Viertel or Velte				7.450 545 L
66	44	11	2⅕	Stübchen			3.386 612 L
264	176	44	8⅕	4	Quart		846.653 mL
1056	704	176	35⅕	16	4	Mengel	211.663 mL

^aAccording to [DOUR] = 212.38 L

For coal

		Metric
grosse Balje		148.632 L
12	Eimer	12.386 L

Other measures reported during the nineteenth century:

1 **Bräu-Malz** = 45 Scheffel = 3334.674 15 L;
1 **Tonne Salz** (for salt) = 3⅓ Scheffel = 247.012 9 L.

80.13.7 Units of Liquid Capacity

For wine from the Rhineland

						Metric
Fuder						869.788 8 L
6	Ohm or Aum ^a					144.964 8 L
24	4	Anker				36.241 2 L
270	45	11¼	Stübchen			3.221 44 L
1080	180	17	4	Quart		805.360 mL
4320	720	68	16	4	Mengel	201.340 mL

^aFor Alsatian and Mosel Wine, during the early nineteenth century, reported as 40 gallons = about 150 L [WORLD]

For beer

					Metric
Tonne					169.719 3 L
45	Stübchen				3.771 54 L
180	4	Quart			942.885 mL
720	16	4	Mengel or Mingel		235.721 25 mL

For oil and train oil

				Metric
Oxhoft ^a				215.352 L
2	Tonne			107.676 L
12	6	Steekkanne		17.946 L
192	96	16	Mingel	1.121 625 L

^aAccording to [DOUR] = 228.51 L

80.13.8 Units of Weight

Upper scale between 1818 and 1858

					Metric
Schiffslast					1994 kg
2	Tonne				997 kg
12 ^{79/77}	6 ^{38/77}	Schiffspfund			153.538 kg
285 ^{7/7}	142 ^{7/7}	22	Liespfund		6.979 kg
4000	2000	308	14	Pfund	498.500 g

Lower scale between 1818 and 1858

						Metric
Pfund						498.500 g
2	Mark					249.250 g
16	8	Unze				31.156 25 g
32	16	2	Loth			15.578 125 g
128	64	8	4	Quentchen		3.894 531 g
512	256	32	16	4	Orth	973.632 mg

After 1858

									Metric
Last									6000 kg
2	Commerzlast								3000 kg
3	1½	Schiffslast							2000 kg
6	3	2	Tonne						1000 kg
120	60	40	20	Centner					50 kg
12,000	6000	4000	2000	100	Pfund				500 g
120,000	60,000	40,000	20,000	1000	10	Neuloth			50 g
1,200,000	600,000	400,000	200,000	10,000	100	10	Quint		5 g
12,000,000	6,000,000	4,000,000	2,000,000	100,000	1000	100	10	Halbgramm	500 mg

For gold and silver before 1858

								Metric
Mark								233.855 500 g
8	Unze							29.231 937 5 g
16	2	Loth						14.615 968 7 g
64	8	4	Quentchen					3.653 992 2 g
256	32	16	4	Pfennig				913.498 mg
512	64	32	8	2	Heller			456.749 mg
65,536	8192	4096	1024	256	128	Richtpfennig		3.568 mg

For gold and silver after 1858

		Metric
Pfund		500 g
10,000	Ass	50 mg

For medical use before 1858

					Metric
Pfund					357.853 8 g
12	Unze				29.821 g
96	8	Drachme			3.728 g
288	24	3	Skrupel		1.242 g
5760	480	60	20	Gran	62.13 mg

For medical use after 1858

				Metric
Unze				30 g
8	Drachme			3.75 g
24	3	Skrupel		1.25 g
480	60	20	Grän	62.5 mg

Other measures reported during the nineteenth century:

- 1 **Pfund Schwer** = 300 Pfund = 149.550 kg;
- 1 **Wage** (for iron) = 120 Pfund = 59.820 kg;
- 1 **Stein** (for flax) = 20 Pfund = 9.970 kg;
- 1 **Centner** = 16 Pfund = 7.976 kg;
- 1 **Stein** (for wool and feathers) = 10 Pfund = 4.985 kg;
- 1 **Krämerpfund** (for trade) = 470.283 g.

80.14 Brunswick(-Wolfenbüttele)

Wolfenbüttele was annexed to Brunswick in 1257. Division was undertaken in 1373 and 1495, but the Wolfenbüttele survived in the younger line. When the succession died out in 1634, the lands fell to the cadet line in Dannenberg. The line became extinct once again and passed to Brunswick-Bevern in 1735. During the early nineteenth century, two of the dukes were killed in battle, the territory was

occupied from 1806 to 1813 by the French, and was, from 1807 to 1813, a part of the Kingdom of Westphalia. The Congress of Vienna of 1815 turned it into an independent county, as the Duchy of Brunswick. In 1871, Brunswick became a state in the German Reich. From 1884 until 1913, Brunswick-Wolfenbützel was governed by Prussia, and then turned over to the only surviving prince of Brunswick, Ernest Augustus, who was forced to abdicate in 1918, whereupon the Free State of Brunswick was founded as a member of the Weimar Republic. In 1946, Brunswick-Wolfenbützel became a part of Lower Saxony.

80.14.1 Currency

1858–1872: 1 Thaler = 30 Groschen = 300 Pfennigen
 1835–1858: 1 Thaler = 24 Groschen = 288 Pfennigen
 1817–1834: 1 Thaler = 24 guten Groschen = 288 Pfennigen
 1764–1817: 1 Reichthaler = 36 Mariengroschen
 1 Mariengulden = 20 Mariengroschen = $26\frac{2}{3}$ Groschen = 40 Matthiers = 160 Pfennigen = 320 Heller

80.14.2 Units of Length

The Regulation for measures from March 30, 1838, shortened the length of the Werkfuß to 126.5 Parisian lines. The standard meter was defined in 1799 at a length of exactly 443.296 Parisian lines, while the length of the Werkfuß was stated as being exactly $31\frac{625}{110\,824}$ m \approx 0.285 362 376 m.

For mining and engineering

					Metric
Lachter					1.919 260 m
8	Spann				239.907 5 mm
80	10	Lachterzoll			23.990 75 mm
800	100	10	Primen		2.399 075 mm
8000	1000	100	10	Sekunde	239.907 5 µm

Two reported scales for yarn

					Metric	Metric
Bund					–	38,541.924 m
20	Haus-Lopp				1926.20 m	1927.096 200 m
200	10	Gebind			192.620 m	192.709 620 m
18,000	900	90	Faden		2.140 22 m	2.141 218 m
67,500	3375	$337\frac{1}{2}$	$3\frac{3}{4}$	Elle	570.73 mm	570.991 5 mm

Two reported scales for yarn

					Metric	Metric
Werk-Lopp					2140.22 m	2141.218 m
10	Gebind				214.022 m	214.121 8 m
1000	100	Faden			2.140 22 m	2.141 218 m
3750	375	$3\frac{3}{4}$	Elle		570.73 mm	570.991 5 mm

Between 1838 and 1871

							Metric
Meile							7419.422 4 m
1625	Ruthe						4.565 798 m
$6\,933\frac{1}{3}$	$4\frac{4}{15}$	Faden					1.083 453 m
13,000	8	$1\frac{7}{8}$	Elle				570.724 752 mm
26,000	16	$3\frac{3}{4}$	2	Fuß or Werkfuß			285.362 376 mm
312,000	192	45	24	12	Zoll		23.780 198 mm
3,744,000	2304	540	288	144	12	Linie	1.981 683 mm

80.14.3 Units of Area

Upper scale used between 1838 and 1872

					Metric
Waldmorgen					3335.442 2 m ²
1 $\frac{1}{3}$	Feldmorgen				2501.581 7 m ²
2 $\frac{2}{3}$	2	Vorlinge			1250.790 8 m ²
160	120	60	Quadratrute		20.846 514 m ²
40,960	30,720	15,360	256	Quadratfuß	8.143 169 dm ²

Lower scale used between 1838 and 1872

			Metric
Quadratfuß			8.143 169 dm ²
144	Quadratzoll		5.654 979 dm ²
20,736	144	Quadratlinie	3.927 069 dm ²

80.14.4 Units of Volume

							Metric
Schachtrute^a							5.948 810 m ³
2 $\frac{1}{25}$	Karre^b						2.323 754 m ³
3 $\frac{3}{5}$	1 $\frac{1}{4}$	Malter^c					1.859 003 m ³
128	50	40	Maß^d				46.475 078 dm ³
256	100	80	2	Kubikfuß			23.237 539 dm ³
442,368	172,800	138,240	3456	1728	Kubikzoll		13.447 650 cm ³
–	–	–	–	–	1728	Kubiklinie	7.782 205 mm ³

^aUsually used for pebbles, sand and soil

^bUsually used for charcoal

^cUsually used for firewood. Also called 1 **Molt**

^dUsually used for stone coal, ore, lignite and turf

Other reported measures:

1 **Maass** (for stone coal, ore, lignite and turf) =
2 Kubikfuß.

80.14.5 Units of Dry Capacity

						Metric
Last^a						3114.475 765 L
2 $\frac{1}{2}$	Vispel or Wispel					1245.790 306 L
10	4	Scheffel				311.447 576 L
100	40	10	Himten			31.144 758 L
400	160	40	4	Vierfaß		7.786 189 L
1600	640	160	16	4	Becher, Metze, or Loch	1.946 547 L

^aFor rye

80.14.6 Units of Liquid Capacity

								Metric
Fuder								899.370 24 L
4	Oxhoft							224.842 56 L
6	1½	Ohm						149.895 04 L
8⅞	2⅔	1⅓ ₂₇	Bierfass^a					101.179 15 L
24	6	4	2⅔ ₁₀	Anker				37.473 76 L
240	60	40	27	10	Stübchen			3.747 376 L
960	240	160	108	40	4	Quartier		936.844 mL
1920	480	320	216	80	8	2	Nöbel	468.422 mL

^aFor beer. Also reported, by [MART3], as 101.180 118 L

During the late nineteenth century, based on [MART3]

						Metric
Tonne						374.741 177 L
1⅔	Oxhoft					224.844 706 L
2½	1½	Ohm				149.896 471 L
10	6	4	Anker			37.474 118 L
400	240	160	40	Quartier		936.853 mL

Other reported measures:

1 **Fass Mumme** = 400 Quartier = 374.737 6 L.

80.14.7 Units of Weight

Traditional system after 1807, after 1835 and after 1838

					Metric	Metric	Metric
Schiffslast					1869.33 kg	1872.46 kg	1870.844 kg
40	Centner				46.733 kg	46.811 kg	46.771 1 kg
4000	100	Pfund			467.332 g	468.114 g	467.711 1 g
128,000	3200	32	Lot		14.604 g	14.628 g	14.615 97 g
512,000	12,800	128	4	Quentche	3.651 g	3.657 g	3.654 g

Metric-linked system used between 1852 and 1871

						Metric
Centner						50 kg
100	Zollpfund					500 g
1000	10	Neuloth				50 g
10,000	100	10	Quint			5 g
100,000	1000	100	10	Halbgram		500 mg

For gold and silver

			Metric
Mark			233.855 g
16	Loth		14.616 g
288	18	Grän	812.00 mg

For medical use

					Metric
Pfund					350.783 g
12	Unz				29.232 g
96	8	Drachme			3.654 g
288	24	3	Skrupel		1.218 g
5760	480	60	20	Gran	60.90 mg

80.15 Hamburg (Freie und Hansestadt Hamburg)

In 834, Hamburg was designated as the seat of a Roman Catholic bishopric. In 1110, Hamburg and the territory of Holstein came under the rule of Count Adolf I of Schauenburg. In 1241, Hamburg joined with Lübeck to form a patnership in what was to become the Hanseatic League. At the unwinding of the Holy Roman Empire in 1806, the Free Imperial City of Hamburg became a sovereign state, in 1871, a part of the German Empire, and in 1949, one of the sixteen States of Germany.

The metric system has been official since January 1, 1872.

Other reported measures:

- 1 **Brabanter Elle** = 771.94 mm;
 1 **Hamburger Brabanter Elle** = 691.41 mm;
 1 **Rheinländische Fuss** = 313.853 mm.

80.15.1 Currency

–1873: 1 Hamburg Mark = 16 Schilling =
 192 Pfennig

80.15.2 Units of Length

For general use before 1830

									Metric
Meile									7336.230 40 m
177 $\frac{1}{2}$	Webe^a								41.266 296 m
1600	9	Geestruthe							4.585 144 m
1 828 $\frac{1}{2}$	10 $\frac{1}{2}$	1 $\frac{1}{2}$	Marschruthe						4.012 001 m
2 133 $\frac{1}{3}$	12	1 $\frac{1}{3}$	1 $\frac{1}{6}$	Ruthe					3.766 242 m
4 266 $\frac{2}{3}$	24	2 $\frac{2}{3}$	2 $\frac{1}{3}$	2	Klafter				1.719 429 m
12,800	72	8	7	6	3	Elle			573.143 mm
25,600	144	16	14	12	6	2	Fuß		286.571 5 mm
307,200	1728	192	168	144	72	24	12	Zoll	23.880 9 mm
2,457,600	13,824	1536	1344	1152	576	192	96	8	Theile 2.985 mm

^aFor canvas

Two reported scales for general use before 1872

							Metric	Metric
Geestruthe or Geestland-ruthe							4.587 936 m	4.583 845 m
1 $\frac{1}{2}$	Marschruthe or Marschland-ruthe						4.014 444 m	4.010 864 m
2 $\frac{2}{3}$	2 $\frac{2}{3}$	Klafter					1.720 476 m	1.718 942 m
8	7	3	Elle				573.492 mm	572.981 mm
16	14	6	2	Fuß			286.746 mm	286.490 mm
192	168	72	24	12	Zoll		23.895 5 mm	23.874 2 mm
1536	1344	576	192	96	8	Achtheil	2.986 94 mm	2.984 27 mm

Frankfurt scale, also used in Hamburg until 1871, as reported by [MART3]

			Metric
Fuss			284.610 mm
12	Zoll		23.717 mm
144	12	Linie	1.976 mm

For measuring the round part of boat masts and steeples

		Metric
Fuß		287 mm
3	Palm	95 $\frac{2}{3}$ mm

For surveying and engineering

				Metric
Rhenland Fuß				313.794 6 mm
12	Zoll			26.149 55 mm
120	10	Linie		2.614 955 mm
1200	100	10	Theile	26 149.55 µm

For measuring road distances

			Metric
Meile			7.531.07 m
2000	Rheinland Ruthe		3.765 53 m
24,000	12	Rhenland Fuß	313.794 6 mm

80.15.3 Units of Area

				Metric
Morgen				9657.691 214 m ²
21	Havelboden			459.890 058 m ²
600	28 $\frac{2}{3}$	Marsch-Quadrat-Ruthe		16.096 152 m ²
117,600	5600	196	Quadratfuß	8.212 322 dm ²

Frankfurt scale, also used in Hamburg until 1871, as reported by [MART3]

		Metric
Morgen		1906.470 6 m ²
160	Quadrat Ruthe	11.915 441 m ²

For fields

			Metric
Scheffel Saatland or Scheffel Geestland			4204.709 1 m ²
200	Geest-Quadrat-Ruthe		21.023 545 m ²
51,200	256	Quadratfuß	8.212 322 dm ²

80.15.4 Units of Volume

For firewood before 1855

		Metric
Klafter (6 $\frac{2}{3}$ Fuß × 6 $\frac{2}{3}$ Fuß × 2 Fuß)		2.091 927 m ³
88%	Kubikfuß	23.534 176 dm ³

For firewood after 1855

				Metric
Klafter (6 Fuß × 6 Fuß × 4 Fuß)				3.388 922 m ³
144	Kubikfuß			23.534 176 dm ³

For firewood (Frankfurt scale), based on [MART3]

				Metric
Klafter (6 Fuß × 6 Fuß × 4 Fuß)				3.319 814 m ³
144	Kubikfuß			23.054 dm ³

Other reported measures:

1 **Schachtwerk** (for excavations in Altona)⁵ = 6.024 7 m³.

80.15.5 Units of Dry Capacity

For general use

					Metric
Fass					54.961 50 L
2	Himt				27.480 75 L
8	4	Spint			6.870 187 L
32	16	4	Maß		1.717 547 L
64	32	8	2	Mässlein	858.773 mL

For barley and oats

						Metric
Stock						4946.535 L
1½	Last					3297.690 L
3	2	Wispel				1648.845 L
30	20	10	Scheffel			164.884 50 L
90	60	30	3	Fass		54.961 50 L
180	120	60	6	2	Himt	27.480 75 L

For wheat, rye and peas

					Metric
Last					3297.690 L
3	Wispel				1099.230 L
30	10	Scheffel			109.923 L
60	20	2	Fass		54.961 50 L
120	40	4	2	Himt	27.480 75 L

Other measures reported during the nineteenth century:

1 **Tonne** (for coal) = 223.870 L;
1 **Tonne** (for lime) = 3 Fass = 164.884 L;
1 **Tonne** (for salt) = 164.794 L.

In Altona before 1844

				Metric
Fass				52.734 L
2	Himt			26.367 L
8	4	Spint		6.592 L

In Altona after 1844

			Metric
prussian Scheffel			54.962 L
2	Himt		27.481 L

80.15.6 Units of Liquid Capacity

Two reported upper scales

					Metric	Metric
Fuder					866.40 L	869.52 L
4	Oxhoft				216.60 L	217.38 L
6	1½	Ohm			144.40 L	144.92 L
24	6	4	Anker		36.10 L	36.23 L
30	7½	5	1¼	Eimer	28.88 L	28.984 L

⁵ [GIER].

Two reported lower scales

						Metric	Metric
Eimer						28.88 L	28.984 L
4	Viertel					7.22 L	7.246 L
8	2	Stübchen				3.61 L	3.623 L
16	4	2	Kanne			1.805 L	1.811 5 L
128	32	16	8	Quartier		225.625 mL	226.438 mL
256	64	32	16	2	Oessel	112.812 mL	113.219 mL

For wine from France, based on [MART3]

										Metric
Fass										869.460 L
4	Oxhoft									217.365 L
6	1½	Ohm								144.910 L
24	6	4	Anker							36.227 50 L
30	7½	5	1¼	Eimer						28.982 00 L
120	30	20	5	4	Viertel					7.245 50 L
240	60	40	10	8	2	Stübchen				3.622 75 L
480	120	80	20	16	4	2	Kanne			1.811 375 L
960	240	160	40	32	8	4	2	Quartier		905.687 5 mL
1920	480	320	80	64	16	8	4	2	Oessel or Nösel	452.843 75 mL

For whale-oil, based on [MART3]

								Metric
Qvartel								231.856 L
1⅓	Fass							144.910 L
2	1¼	Trantonne						115.928 L
12	7½	6	Stechkanne					19.321 333 L
64	40	32	5⅓	Stübchen				3.622 750 L
192	120	96	16	3	Mengel			1.207 583 L
432	270	216	36	6¾	2¼	Quartier		536.704 mL

Other measures reported during the nineteenth century:

1 **Biertonne** (for beer) = 48 Stübchen = 173.892 L;

1 **Salztonne** (for salt) = 164.8 L;

1 **Schmaltonne** = 32 Stübchen = 115.926 L;

1 **Thrantonne** (for train oil) = 32 Stübchen = 115.926 L;

1 **Essigtonne** (for vinegar) = 30 Stübchen = 108.682 5 L;

1 **Stechkanne** = 16 Mengeln = 57.963 L.

80.15.7 Units of Weight

Before 1858

							Metric
Schiffpfund							135.554 kg
2½	Centner						54.221 kg
20	8	Liespfund					6.778 kg
280	112	14	Pfund				484.12 g
8960	3584	448	32	Loth			15.129 g
35,840	14,336	1792	128	4	Quentchen		3.782 g
143,360	57,344	7168	512	16	4	Pfenniggewicht	945.55 mg

Before 1858, based on [MART3]

									Metric
Schiffpfund ^a									155.075 024 kg
–	Schiffpfund ^b								135.690 646 kg
–	2½	Centner							54.276 258 kg
–	20	8	Liespfund						6.784 532 kg
320	280	112	14	Pfund					484.609 45 g
5120	4480	1792	224	16	Unze				30.288 g
10,240	8960	3584	448	32	2	Loth			15.144 g
40,960	35,840	14,336	1792	128	8	4	Quentchen		3.786 g
163,840	143,360	57,344	7168	512	32	16	4	Pfenniggewicht	946.50 mg

^aUsed at land
^bUsed at sea

Other measures reported during the nineteenth century:

1 **Commerzlast** = 6000 Pfund = 2907.657 kg;
1 **Schiffslast** = 4000 Pfund = 1938.438 kg;
1 **schwere Stein** (for wool) = 22 Pfund = 10.661 41 kg;

1 **schwere Stein** (for flax and hemp) = 20 Pfund = 9.692 19 kg;
1 **leichte Stein** (for feathers, wool, etc.) = 10 Pfund = 4.846 095 kg;
1 **Karat** (for pearls and jewels) = 4 Gran = 205.858 mg, and divided into 1/2, 1/4, 1/8, 1/16, 1/32 and 1/64 Karat.

Metric-linked system after 1858

								Metric
Commerzlast								3000 kg
1½	Schiffslast							2000 kg
3	2	Tonne						1000 kg
60	40	20	Centner					50 kg
6000	4000	2000	100	Zollpfund				500 g
60,000	40,000	20,000	1000	10	Neuloth			50 g
600,000	400,000	200,000	10,000	100	10	Qvint		5 g
6,000,000	4,000,000	2,000,000	100,000	1000	100	10	Halbgram	500 mg

For medical use before 1856

						Metric
Medicinal Pfund						350.783 g
12	Unze					29.232 g
96	8	Drachme				3.654 g
288	24	3	Scrupel			1.218 g
5760	400	60	20	Grän		60.9 mg

For medical use after 1856

					Metric
Unze					30 g
8	Drachme				3.75 g
24	3	Skrupel			1.25 g
480	60	20	Gran		62 mg

For gold and silver during the early nineteenth century

							Metric
Kölner Mark							233.854 g
8	Unze						29.232 g
16	2	Loth					14.616 g
64	8	4	Quentche				3.654 g
256	32	16	4	Pfennig or Richtpennigtheile			913.496 mg
4352	544	272	68	17	Essein		53.735 mg

For gold and silver during the late nineteenth century

					Metric
Kölner Mark					233.92 g
16	Loth				14.62 g
64	4	Quint			3.655 g
256	16	4	Pfennig		913.75 mg

80.16 Hanover

Hanover was originally a electorate that, between the years 1815–1866, came to be a kingdom. In 1866, it was annexed by Prussia during the Austro-Prussian war.

80.16.1 Currency

1817–1866: 1 Hannover Thaler = 24 Groschen
 = 288 Pfennige
 –1817: 1 Hannover Thaler = 36
 Mariengroschen = 288 Pfennige

80.16.2 Units of Length

Before 1836

							Metric
Meile							7419.213 m
1 587½	Rute						4.673 52 m
4 233⅓	2⅔	Klafter					1.752 57 m
12,700	8	3	Elle				584.190 mm
25,400	16	6	2	Fuß			292.095 mm
304,800	192	72	24	12	Zoll		24.341 25 mm
3,657,600	2304	864	288	144	12	Linie	2.028 438 mm

Upper scale used after 1836

						Metric
Landmeile						9347.2 m
2	Wegstunde					4673.6 m
2000	1000	Rute				4.673 6 m
4800	2400	2⅔	Lachter^a			1.947 33 m
5 333⅓	2666⅔	2⅔	1⅔	Klafter		1.752 6 m

^aAlso reported as 1.919 8 m

Lower scale used after 1836

							Metric
Klafter							1.752 6 m
2¼	Schritt						778.933 mm
3	1⅓	Elle					584.20 mm
6	2⅔	2	Fuß				292.10 mm
7⅕	3⅕	2⅔	1⅓	Spann			243.417 mm
72	32	24	12	10	Zoll		24.341 7 mm
864	384	6912	144	120	12	Linie	2.028 5 mm

At Celle before 1836

		Metric
Ruthe		4.671 912 m
16	Fuß	291.994 5 mm

80.16.3 Units of Area

Upper scale used before 1836 and from 1836 to 1871

						Metric	Metric
Morgen						2608 m ²	2621.015 m ²
1⅓	Drohn					1953 m ²	1965.761 m ²
2	1½	Vorling				1302 m ²	1310.507 34 m ²
120	90	60	Quadratruete			21.7 m ²	21.841 789 m ²
853⅓	640	426⅔	7⅙	Quadratklafter		3.06 m ²	3.071 502 m ²
30,720	23,040	15,360	256	36	Quadratfuß	8.49 m ²	8.532 dm ²

Lower scale used from 1836 to 1871

			Metric
Quadratfuß			8.532 dm ²
144	Quadratzoll		5.925 cm ²
20,736	144	Quadratlinie	4.114 6 mm ²

Other reported measures:

1 **Quadratlachter** = 3.685 6 m².

80.16.4 Units of Volume

			Metric
Klafter			3.588 652 m ³
144	Kubikfuß		2.492 268 dm ³
248,832	1728	Kubikzoll	14.422 84 cm ³

Other reported measures:

1 **Schachrute** = 6.379 859 2 m³.

80.16.5 Units of Dry Capacity

System used before 1836

						Metric
Last						2985.6 L
2	Wispel					1492.8 L
16	8	Malter				186.60 L
96	48	6	Himt			31.10 L
288	144	18	3	Drittel		10.37 L
384	192	24	4	1⅓	Vierfaß	7.78 L

Upper scale used after 1836

						Metric
Last						2990.56 L
1 ⁵⁷ / ₂₄₇	Fuder					2429.83 L
2 ¹⁰ / ₁₉	2 ⁷ / ₁₉	Vierup				1183.76 L
2⅔	2⅙	1⅙ ₁₈	Wispel			1121.46 L
16	13	6⅓	6	Malter		186.91 L
96	78	38	36	6	Himten	31.152 L

Lower scale used after 1816

				Metric
Himten				31.152 L
4	Metzen or Spint			7.787 9 L
8	2	Stübchen or Hoop		3.894 L
16	4	2	Mühlenkopf	1.946 98 L

For beer

				Metric
Brau				17,413.968 L
43	Fass			404.976 L
172	4	Tonne		101.244 L
4472	104	26	Stübchen	3.894 L

For cereals in Celle

					Metric
Last					3112 L
10	Scheffel				311.20 L
25	2½	Wispel			124.48 L
100	6	4	Himt		31.12 L
400	24	16	4	Spint	7.78 L

For cereals in Verden

Malter		
1½	Scheffel	
12	8	Himt

In Ostfriesland

		Metric
Vierup		49.843 L
36	Krug	1.3845 L

80.16.6 Units of Liquid Capacity

Traditional upper scale after 1714 and after 1836

					Metric	Metric
Fuder					885 L	934.548 L
4	Oxhoft				221.25 L	233.637 L
6	1½	Ohm or Ahm			147.5 L	155.758 L
15	3¾	2½	Eimer		59 L	62.303 L
24	6	4	1⅓	Anker	36.875 L	38.939 5 L

Traditional lower scale after 1714 and after 1836

						Metric	Metric
Anker						36.875 L	38.939 5 L
5	Viertel					7.375 L	7.787 9 L
10	2	Stübchen				3.687 5 L	3.789 45 L
20	4	2	Kanne or Maas			1.843 75 L	1.894 725 L
40	8	4	2	Quartier or Ort		921.875 mL	947.362 5 mL
80	16	8	4	2	Nöbel or Ösel	460.937 5 mL	473.681 25 mL

80.16.7 Units of Weight

Traditional system

					Metric
Pfundscher					146.891 kg
1½	Schiffspfund				122.409 kg
3	2½	Centner			48.963 5 kg
24	20	8	Liespfund		6.120 44 kg
336	280	112	14	Pfund	437.174 g

Alte emdener scale

					Metric
Commerzlast					2981.106 kg
1½	Schiffslast				1987.404 kg
20	13½	Schiffspfund			149.055 kg
60	40	3	Centner		49.685 kg
6000	4000	300	100	Pfund	496.851 g

Traditional system used before 1826, after 1826 and after 1835

				Metric	Metric	Metric
Centner				49.011 6 kg	48.960 8 kg	46.771 1 kg
100	Pfund			490.116 g	489.608 g	467.711 g
3200	32	Lot		15.316 125 g	15.300 25 g	14.615 97 g
12,800	128	4	Quentchen	3.829 031 g	3.825 062 g	3.653 992 g

Upper scale used after 1836

						Metric
Last						1644.955 2 kg
10	Pfund Schwerer					164.495 5 kg
12	1½	Schiffslast				137.079 6 kg
30	3	2½	Centner			54.831 8 kg
240	24	20	8	Liespfund		6.853 98 kg
3360	336	280	112	14	Pfund	489.57 g

Lower scale used after 1836

								Metric
Stein (for flax)								9.791 kg
2	Stein (for wool)							4.896 kg
20	10	Pfund						489.57 g
40	20	2	Mark					244.785 g
320	160	16	8	Unz				30.598 g
640	320	32	16	2	Loth			15.299 g
2560	1280	128	64	8	4	Quentchen		3.825 g
10,240	5120	512	256	32	16	4	Oertchen	956.19 mg

Metric-linked system used after 1858

						Metric
Schiffslast						2000 kg
2	Tonne					1000 kg
40	20	Centner				50 kg
4000	2000	100	Zollpfund			500 g
40,000	20,000	1000	10	Loth		50 g
400,000	200,000	10,000	100	10	Quentchen	5 g

Other reported measures:

1 **Pferdelast** = 1200 Pfund.

For gold and silver

				Metric
Verinsmark				233.855 g
16	Loth			14.616 g
288	18	Gran		811.996 mg

Apothecary weights

						Metric
Pfund						350.783 g
12	Unze					29.232 g
96	8	Drachme				3.654 g
288	24	3	Skrupel			1.218 g
5760	480	60	20	Gran		60.9 mg

80.17 Hesse

In 1567, this territory was divided into four parts: Hesse-Cassel, Hesse-Darmstadt, Hesse-Rheinfels and Hesse-Marburg. In 1583, Hesse Rheinfels became part of Hesse-Cassel, and in 1604, Hesse-Marburg was split between Hesse-Cassel and Hesse-Darmstadt. In 1622, Hesse-Homburg was split off from Hesse-Darmstadt. Hesse-Cassel was elevated to the rank of an Electorate in 1803. It was then annexed by Prussia in 1866, and, together with Frankfurt, Hesse-Homburg and Nassau, the province of Hesse-Nassau was established. Hesse-Darmstadt was elevated to the rank of a Grand Duchy in

1806 and became a part of the German Empire in 1871. The Free State of Waldeck became part of Hesse-Nassau in 1929.

80.17.1 Currency

1857–1873: 1 Hesse-Kassel Vereinsthaler =
30 Silbergroschen = 360 Pfennige

1841–1857: 1 Hesse-Kassel Thaler =
30 Silbergroschen = 360 Heller

1819–1841: 1 Hesse-Kassel Thaler =
24 Mariengroschen = 288 Pfennige = 384 Heller

1753–1819: 1 Hesse-Kassel Reichthaler =
32 Albus = 288 Pfennige = 384 Heller

In Frankfurt:

1857–1866: 1 Thaler = $1\frac{3}{4}$ Gulden =
30 Silbergroschen = 105 Kreuzer

1837–1857: 1 Gulden = 60 Kreuzer =
240 Pfennige

1753–1837: 1 Reichthaler = $1\frac{1}{2}$ Gulden = $22\frac{1}{2}$
Batzen = 30 Groschen = 90 Kreuzer = 360 Heller

80.17.2 Units of Length

In Arolsen, present-day Bad Arolsen, before 1858

				Metric
Ruthe				4.661 840 m
8	Elle			582.730 mm
16	2	Fuss		291.365 mm
192	24	12	Zoll	24.280 mm

In Darmstadt before 1821

				Metric
Elle				547.693 mm
4	Viertel			136.923 mm
8	2	Achtel		68.462 mm
16	4	2	Sechzehntel	34.231 mm

In Frankfurt before 1821

					Metric
Feldrute					3.557 630 m
10	Feldfuß				355.763 m
12½	1¼	Werkfuß or Shuh			284.6 mm
150	15	12	Zoll		23.72 mm
1800	180	144	12	Linie	1.976 mm

For woodland in Frankfurt before 1872

				Metric
Waldrute				4.510 760 m
10	Zehntelrute or Waldschuh			451.076 mm
100	10	Zoll		45.108 mm
1000	100	10	Linie	4.511 mm

For arable land in Frankfurt before 1872

				Metric
Feldrute				3.557 630 m
10	Feldschuh			355.763 mm
100	10	Zoll		35.576 mm
1000	100	10	Linie	3.558 mm

For surveying in Frankfurt before 1872

				Metric
Klafter				1.707 662 m
6	Fuss			284.610 mm
60	10	Zoll		28.461 mm
600	100	10	Linie	2.846 mm

In Fulda between 1813 and 1872

					Metric
Ruthe					3.394 560 m
6	Elle				565.760 mm
12	2	Fuß or Schuh			282.880 mm
144	24	12	Zoll		23.573 mm
1728	288	144	12	Linie	1.964 mm

In Hanau before 1871

				Metric
Ruthe				3.569 500 m
10	Schuh			3.569 500 dm
100	10	Zoll		3.569 500 dm

In Hanau before 1871

			Metric
Fuß			286.900 mm
12	Zoll		23.908 mm
144	12	Linie	1.992 4 mm

Werkschuh-scale in Mainz before 1821

			Metric
Schuh			291.5 mm
12	Zoll		24.292 mm
144	12	Linie	2.024 mm

Kameral-scale in Mainz before 1821

			Metric
Ruthe			4.600 m
16	Kameralschuh		287.5 mm
192	12	Zoll	23.958 mm

In Kassel before 1860

				Metric
Meile				9206.369 333 m
32,000	Fuß			287.699 mm
384,000	12	Zoll		23.974 9 mm
4,608,000	144	12	Linie	1.997 9 mm

Other measures reported as used before metrification:

- 1 **Meile** = 9867.75 m;
- 1 **Waldruthe** = 4.510 8 m;
- 1 **kastaster Ruthe** or **alter alter kassler** =
14 kataster Fuss = 3.988 76 m;
- 1 **Haspel Garnmaaß** = 2.553 9 m;
- 1 **Brabanter Elle** = 699 mm;
- 1 **hanauer Brabanter Elle** (in Hanau) =
694.700 mm;
- 1 **kassler Brabanter Elle** = 694.313 mm;
- 1 **kassler Elle** = 570.402 mm;
- 1 **Elle** (at Mainz) = 551.18 mm;
- 1 **Frankfurter Elle** = 547.30 mm;
- 1 **hanauer Elle** (in Hanau) = 543.800 mm;
- 1 **Fuß** (in Darmstadt before 1821) = 287.619
mm;
- 1 **kataster Fuss** or **alter kassler Fuß** =
284.911 mm.

Metric-linked system used in Hesse-Darmstadt between 1821 and 1871

								Metric
Meile or Postmeile								7500 m
1½	Wegstunde							5000 m
3000	2000	Klafter						2.5 m
4166⅔	2777⅔	1⅞	Haspelfade					1.8 m
12,500	8333⅓	4⅙	3	Elle				600 mm
30,000	20,000	10	7½	2⅕	Fuß			250 mm
300,000	200,000	100	72	24	10	Zoll		25 mm
3,000,000	2,000,000	1000	720	240	100	10	Linie	2.5 mm

80.17.3 Units of Area

In Arolsen, present-day Bad Arolsen, before 1858

			Metric
Morgen			2546.806 897 m ²
120	Quadrat-Ruthe		21.223 391 m ²
30,000	250	Quadrat-Fuss	8.489 356 dm ²

For woodland in Frankfurt before 1872

			Metric
Waldmorgen			3255.512 9 m ²
4	Viertel		813.878 2 m ²
160	40	Quadrat Waldruthe	20.346 9 m ²

For arable land in Frankfurt before 1872

					Metric
Hube or Hufe					60,752.309 8 m ²
30	Feldmorgen				2025.077 0 m ²
120	4	Viertel			506.269 2 m ²
4800	160	40	Quadrat Feldruthe		12.656 7 m ²
750,000	25,000	6250	156¼	Quadrat Fuss	8.100 3 dm ²

In Fulda between 1813 and 1872

					Metric
Hufe					55,310.058 04 m ²
15	Tagewerk				3687.372 m ²
30	2	Acker or Morgen			1843.686 m ²
4800	320	160	Quadrat-Ruthe		11.523 038 m ²
	46,080	23,040	144	Quadrat-Schuh	8.002 1 dm ²

In Hanau before 1871

						Metric
Waldmorgen						2466.721 488 m ²
1 ²¹ / ₁₀₀	Feldmorgen					2038.612 800 m ²
4 ²¹ / ₂₅	4	Viertel				509.653 200 m ²
193⅔	160	40	Quadratruthe			12.741 330 m ²
1936	1600	400	10	Schichtschuh		1.274 133 m ²
19,360	16,000	4000	100	10	Schichtzoll	12.741 330 dm ²

In Kassel before 1860

				Metric
Acker or Morgen				2386.530 9 m ²
150		Quadrat-Ruthe		15.910 206 m ²
29,400		196	Quadrat-Fuss	8.117 4 dm ²

In Darmstadt before 1821

		Metric
Morgen or Feldmorgen		3387.948 m ²
40,954½	Quadrat Fuß	8.272 47 dm ²

Other measures reported as used in Hesse-Darmstadt before metrification:

1 **Waldmorgen** (in Darmstadt) = 3255.5 m².

Metric-linked system in Hesse-Darmstadt between 1821 and 1871

					Metric
Morgen					2500 m ²
4	Viertel				625 m ²
400	100	Quadrat Klafter			6.25 m ²
40,000	10,000	100	Quadrat Fuß		6.25 dm ²
4,000,000	1,000,000	10,000	100	Quadrat Zoll	6.25 cm ²

80.17.4 Units of Volume

For firewood in Frankfurt before 1872

			Kubikfuß	Metric
Stoss			454,716	10,483.159 m ³
6	Gilbert		75,786	1747.193 m ³
12	2	Stecken (3.554 Fuß × 3.554 Fuß × 3 Fuß)	37 893	873.597 m ³

For logs for bakeries in Frankfurt before 1872

		Metric
Klafter or Gilbert		2620.791 m ³
3	Stecken	873.597 m ³

Other measures reported as used before metrification:

- 1 **Klafter** (for timber, 5 × 5 × 6 Fuß) = 150 Kubikfuß;
- 1 **Klafter** (for timber in Fulda, 6 × 6 × 4 Frankfurter Fuß) = 144 Frankfurter Kubikfuß = 3.429 080 m³;
- 1 **Klafter** (for timber in Hanau, 6 × 6 × 4 Fuß) = 3.429 080 m²;
- 1 **Klafter** (for firewood in Frankfurt, 7 × 6 × 3 Frankfurter Fuß) = 126 Frankfurter Kubikfuß;
- 1 **Stecken** (for firewood in Hesse-Darmstadt, 5 × 5 × 4 Fuß) = 100 Kubikfuß;

- 1 **Stecken** (for firewood in Mainz, $4\frac{1}{3} \times 4\frac{1}{3} \times 4$ Schuh) = $75\frac{5}{6}$ Kubikschuh;
- 1 **Stecken** (for firewood in Mainz, $4\frac{1}{3} \times 4\frac{1}{3} \times 3\frac{1}{2}$ Schuh) = $65\frac{17}{18}$ Kubikschuh;
- 1 **Stecken** (for firewood in Mainz, $4\frac{1}{3} \times 4\frac{1}{3} \times 3$ Schuh) = $56\frac{2}{3}$ Kubikschuh;
- 1 **Mass** (for charcoal in Darmstadt between 1821 and 1871) = 40 Kubikfuß = 625 L;
- 1 **Bütte** (for coal and lime in Darmstadt between 1821 and 1871) = 10 Kubikfuß = 156.25 L.

Metric-linked system for firewood between 1821 and 1871

			Metric
Kubik Klafter			15.625 m ³
10	Stecken		1.562 5 m ³
1000	100	Kubik Fuß	15.625 dm ³

80.17.5 Units of Dry Capacity

Pyrmonter scale for general use in Arolsen, present-day Bad Arolsen, before 1858

						Metric
Fuder						2278.128 L
4	Malter					569.532 L
16	4	Scheffel				142.383 L
24	6	1½	Himten			94.922 L
72	18	4½	3	Dreilings-Metzen		31.640 667 L
96	24	6	4	1⅓	Vierlings-Metzen	23.730 5 L

For rye in Arolsen, present-day Bad Arolsen, before 1858

					Metric
Roggen-Mütte					205.664 L
4		Roggen-Scheffel			51.416 L
16	4		Roggen-Spind		12.854 L
64	16		4	Roggen-Becher	3.213 5 L

For oats in Arolsen, present-day Bad Arolsen, before 1858

					Metric
Hafer-Mütte					226.544 L
4		Hafer-Scheffel			56.636 L
16	4		Hafer-Spind		14.159 L
64	16		4	Hafer-Becher	3.539 75 L

In Darmstadt before 1821

					Metric
Malter					112.330 000 L
4		Simmer			28.082 500 L
16	4		Kumpf		7.020 625 L
64	16		4	Gescheid	1.755 156 25 L

For cereals in Frankfurt before 1821

							Metric
Malter^a							114.728 576 L
4	Simmer						28.682 144 L
8	2	Metze					14.341 072 L
16	4	2	Sechter or Kumpf				7.170 536 L
64	16	8	4	Gescheid			1.792 634 L
256	64	32	16	4	Mäßchen or Viertelgescheid		448.158 mL
1024	256	128	64	16	4	Schrott	112.040 mL

^a1 **Malter** (for wheat) = 183 Pfund = 91.50 kg, 1 **Malter** (for rye) = 173 Pfund = 86.50 kg, and 1 **Malter** (for flour) = 138 Pfund = 64 kg, and 1 **Malter** (for oats) = 110 Pfund = 55 kg

In Fulda before 1813 and between 1813 and 1872

				Metric	Metric
Malter				177.13 L	175.578 000 L
8	Maß			22.141 L	21.947 250 L
32	4	Metze		5.535 L	5.486 812 L
128	16	4	Köpfsche	1.384 L	1.371 703 L

In Hanau before 1871

						Metric
Kohlenbutte^a						152.650 000 L
1¼	Achtel or Malter					122.120 000 L
5	4	Simmer				30.530 000 L
10	8	2	Metz			15.265 000 L
20	16	4	2	Sechter		7.632 500 L
80	64	16	8	4	Gescheid	1.908 125 L

^aFor charcoal. When used for lime, reported as Kalkbute

In Kassel before 1860

						Metric
Malter						624.952 399 L
4	Viertel					160.738 100 L
8	2	Scheffel				80.369 050 L
16	4	2	Himten			40.184 525 L
64	16	8	4	Metze or Minot		10.046 131 L
256	64	32	16	4	Mäßchen	2.511 533 L

In Mainz before 1821, based on [MART3]

					Metric
Malter					109.387 000 L
4	Viernsel				27.346 750 L
16	4	Kümpf			6.836 687 L
64	16	4	Gescheid		1.709 172 L
256	64	16	4	Mäßchen	427.293 mL

In Marburg, based on [MART3]

					Metric
Malter					415.200 000 L
4	Mött				103.800 000 L
16	4	Meste			25.950 000 L
64	16	4	Vierling or Sester		6.487 500 L
256	64	16	4	Mäßchen	1.621 875 L

Other measures reported as used before metrification:

1 **Malter** (in Bad Camberg) = 160 L;

1 **Kalkbütte** (for lime in Hesse-Darmstadt) = 156.25 L;

1 **Bütte** (for coal or lime in Hanau) = about 5 Simmer = about 152.64 L;

1 **Kalkbütte** (for lime or chalk in Frankfurt) = 141.948 620 L;

1 **Achtel** (at Wetzlar) = 8 Metzen = 133.63 L (for wheat) or 149.42 L (for oats);

- 1 **Achtel** (at Budingen) = 131.63 L (for wheat) or 141.18 L (for oats);
- 1 **Achtel** (at Friedberg) = 8 Metzen = 127.0 L (for wheat) or 134.75 L (for oats);
- 1 **Achtel** (at Gelnhausen) = 127.25 L (for wheat) or 136.43 L (for oats);
- 1 **Bütte** or **Kohlenbütte** (for charcoal, in Frankfurt) = 121.205 677 L;
- 1 **Achtel** (at Butzbach) = 119.69 L (for wheat) or 147.25 L (for oats);
- 1 **Achtel** (at Naumbourg) = 106.28 L;
- 1 **Achtel** (at Lich) = 95.79 L.

Metric-linked system between 1821 and 1871

						Metric
Malter						128 L
4	Simmer					32 L
16	4	Kumpf				8 L
64	16	4	Gescheid			2 L
256	64	16	4	Mäßchen		500 mL
8192	2048	512	128	32	Kubikzoll	15.625 mL

80.17.6 Units of Liquid Capacity

In Arolsen, present-day Bad Arolsen, before 1858

					Metric
Waldecker Ohm					142.820 L
16⅔	Eimer				8.569 20 L
100	6	Maß			1.428 20 L
400	24	4	Schoppen		357.050 mL
1600	96	16	4	Glas	89.262 5 mL

In Darmstadt before 1821

						Metric
Ohm						156.480 000 L
20	Viertel					7.824 000 L
80	4	Maß^a				1.956 000 L
90	4½	1⅙	Maß^b			1.738 667 L
320	16	4	3⅘	Schoppen^a		489.000 mL
360	18	4½	4	1⅙	Schoppen^b	434.667 mL

^aFor beer
^bFor wine

Altmaaß-scale used in wholesale in Frankfurt before 1872

							Metric
Stückfaß							1147.285 760 L
1 $\frac{1}{3}$	Fuder						860.464 320 L
2	1 $\frac{1}{2}$	Zulast					573.642 880 L
5 $\frac{1}{3}$	4	2 $\frac{2}{3}$	Oxhoft				215.116 080 L
8	6	4	1 $\frac{1}{2}$	Ohm			143.410 720 L
160	120	80	30	20	Viertel		7.170 536 L
640	480	320	120	80	4	alte Maaß	1.792 634 L
2560	1920	1280	480	320	16	4 alte Schoppen	448.158 mL

Jungmaaß-scale used in net trade in Frankfurt before 1872

		Metric
Zapfmaaß or Jungmaaß		1.593 45 L
4	junger Schoppen	398.362 5 mL

In Fulda before 1813 and between 1813 and 1872

						Metric	Metric
Fuder						857.136 L	873.566 400 L
6	Ohm					142.856 L	145.594 400 L
12	2	Eimer				71.428 L	72.797 200 L
480	80	40	Maß			1.785 7 L	1.819 930 L
1920	320	160	4	Schoppen		446.425 mL	454.982 mL
7680	1280	640	16	4	Kännchen	–	113.746 mL

Two reported scales (old scale and new scale) in Hanau before 1871

					Metric	Metric
Fuder					895.392 L	–
6	Ohm				149.232 L	–
120	20	Viertel			7.461 600 L	–
480	80	4	Maß		1.865 400 L	1.608 907 L
1920	320	16	4	Schoppen	466.350 mL	402.227 mL

For wine and brandy in Kassel before 1860

					Metric
Fuder					935.760 L
6	Ohm				155.960 L
120	20	Viertel			7.798 L
480	80	4	kassler- Maß		1.949 5 L
1920	320	16	4	Schoppen	487.375 mL

For beer in Kassel before 1860

			Metric
Bier-Ohm			174.755 200 L
80	Bier- Maß		2.184 440 L
320	4	Schoppe	546.110 mL

For wine in Mainz before 1821, based on [MART3]

							Metric
Stückfass							1016.802 00 L
7½	Fuder						813.441 600 L
11¼	1½	Zulast					542.294 400 L
45	6	4	Ohm				135.573 600 L
900	120	80	20	Viertel			6.778 680 L
3600	480	320	80	4	Maß		1.694 670 L
14,400	1920	1280	320	16	4	Schoppen	423.667 mL

For beer in Mainz before 1821, based on [MART3]

				Metric
Ohm				150.856 000 L
20	Viertel			7.542 800 L
80	4	Maß		1.885 700 L
3520	16	4	Schoppen	471.425 mL

In Marburg, based on [MART3]

		Metric
Ohm		148.096 000 L
80	Maß	1.851 200 L

Other measures reported as used before metrification:

- 1 **Zulast** (for wine at Frankfurt) = 573.642 L;
- 1 **Zulast** (for wine at Mainz) = 542.296 L;
- 1 **Ohm** (for beer at Mainz) = 150.856 L.

Metric-linked system for wine used between 1821 and 1871

		Metric
Lögel		50 L
25	Maß	2 L

Metric-linked system used between 1821 and 1871

					Metric
Ohm					160 L
20	Viertel				8 L
80	4	Maß			2 L
320	16	4	Schoppen		500 mL
10,240	512	128	32	Kubikzoll	15.625 L

80.17.7 Units of Weight

In Arolsen, present-day Bad Arolsen, before 1858

		Metric
Libbra Schwergewicht		496.943 g
34	Loth	14.616 g

In Darmstadt before 1821

				Metric
leichte Pfund^a				467.878 g
2	Mark			233.939 g
32	16	Loth		14.621 187 5 g
128	64	4	Quentchen	3.655 296 9 g

^a1 **schwere Pfund** = 505.320 g

In Frankfurt before 1821

				Metric
Zentner				46.771 kg
100	Pfund			467.711 g
3200	32	Loth		14.616 g
12,800	128	4	Quentchen	3.654 g

For heavy weight in Frankfurt before 1858

								Metric
Last								2020.511 520 kg
2	Tonne							1010.255 760 kg
13 $\frac{1}{3}$	6 $\frac{2}{3}$	Schiffpfund						151.538 364 kg
40	20	3	Centner					50.512 788 kg
4000	2000	300	100	Schwere Pfund				505.128 g
8000	4000	600	200	2	Halbe			252.564 g
16,000	8000	1200	400	4	2	Viertel		126.282 g
32,000	16,000	2400	800	8	4	2	Achtel	63.141 g

For small weight in Frankfurt before 1858

								Metric
Wage Eisen^a								56.125 320 kg
1 $\frac{1}{2}$	Centner							50.512 788 kg
109 $\frac{5}{7}$	–	Pfund^b						511.559 g
–	–	–	Pfund^c					482.327 g
120	108	35/32	33/32	(leichte) Pfund				467.711 g
3840	3456	35	33	32	Loth			14.616 g
15,360	13,824	140	132	128	4	Quentchen		3.654 g

^aFor iron^bFor fish^cFor butter and meat

In Frankfurt between 1858 and 1872

								Metric
Schiffslast								2000 kg
2	Tonne							1000 kg
13 $\frac{1}{3}$	6 $\frac{2}{3}$	Schiffpfund						150 kg
40	20	3	Centner					50 kg
4000	2000	300	100	Pfund				500 g
128,000	64,000	9600	3200	32	Loth			15.625 g
512,000	256,000	38,400	12,800	128	4	Quent		3.906 g
2,048,000	1,024,000	153,600	51,200	512	16	4	Richtpfennig	977 mg

In Fulda between 1813 and 1872

				Metric
Zentner				50.997 000 kg
100	Pfund			509.970 g
3200	32	Loth		15.937 g
12,800	128	4	Quentchen	3.984 g

In Hanau before 1871

				Metric
Centner				50.512 788 kg
108	Pfund Silbergewicht			467.711 g
3456	32	Loth		14.616 g
13,824	128	4	Quentchen	3.654 g

Alternative scale in Hanau before 1871

			Metric
Centner			50.512 788 kg
100	schwere Pfund		505.127 880 g
3200	32	Loth	15.785 246 g

For wool in Hanau before 1871

			Metric
Centner			57.451 714 kg
5	Kleuth		11.490 343 kg
90	18	Pfund	638.352 g

For hay (as Heugewicht); for fat (as Schmergewicht); for butter and fish (as Buttergewicht and Fischgewicht) in Hanau before 1871

		Metric	Metric	Metric
Centner		56.125 320 kg	55.540 681 kg	51.448 310 kg
100	Pfund	561.253 g	555.407 g	514.483 g

For merchant use (as Kaufmannsgewicht); for flour and meat (as Mehlgewicht and Fleischgewicht) in Hanau before 1871

		Metric	Metric
Centner		51.068 190 kg	48.232 697 kg
100	Pfund	510.682 g	482.330 g

For wool in Fulda before 1872

			Metric
Centner			54.546 850 kg
5	Kleuth		10.909 370 kg
105	21	Pfund	519.494 g

For wool in Hanau before 1821

			Metric
Centner			57.451 714 kg
5	Kleuth		11.490 343 kg
90	18	Pfund	638.352 g

Schwergewicht^a (heavy weight) in Kassel before 1860

					Metric
Centner					52.298 190 kg
–	Kleuder Wolle				10.369 092 kg
108	21	Pfund			484.242 g
3456	672	32	Loth		15.133 g
13,824	2688	128	4	Quentchen	3.783 g

^aAlso used for flour, bread, meat, butter and cheese

Leichtgewicht in Kassel before 1860

							Metric
Centner							50.523 696 kg
–	Stein Wolle						10.291 864 kg
108	22	Pfund					467.812 g
216	44	2	Mark				233.906 g
1728	352	16	8	Unze			29.238 g
3456	704	32	16	2	Loth		14.619 g
13,824	2816	128	64	8	4	Quentchen	3.655 g

Metric-linked system in Kassel after 1861

							Metric
Centner							50 kg
100	Pfund						500 g
200	2	Mark					250 g
1600	16	8	Unze				31.25 g
3200	32	16	2	Loth			15.625 g
12,800	128	64	8	4	Quentchen		3.906 25 g
51,200	512	256	32	16	4	Richtpfennig	976.562 5 mg

Metric-linked customary system in Kassel after 1861

					Metric
Zollpfund					500 g
30	Loth				16.667 g
300	10	Quentchen			1.667 g
3000	100	10	Zent		166.667 mg
30,000	1000	100	10	Korn	16.667 mg

In Mainz before 1821

						Metric
Centner Kranengewicht						53.658 2 kg
$1\frac{1}{53}$	Zentner					49.892 7 kg
$107\frac{29}{53}$	100	schwere Pfund				498.927 g
114	106	$1\frac{3}{50}$	leichte Pfund			470.686 g
3648	3392	$33\frac{23}{25}$	32	Loth		14.709 g

In Marburg before 1861, based on [MART3]

				Metric
Centner				50.534 690 kg
108	Pfund			467.914 g
3456	32	Loth		14.622 g
13,824	128	4	Quentchen	3.656 g

Other measures reported as used before metrification:

1 **Kleuder** (for wool in Hanau) = 52.618 kg;

1 **Kleuder** (for wool in Fulda) = 10.709 kg;

1 **Kleuder** (for wool in Hesse-Cassel) =
21 Pfund = 10.169 kg;

1 **marco** (for money in Frankfurt between 1857 and 1872) = 500 g;

1 **marco** (for money in Frankfurt before 1837) = 233.956 8 g;

1 **marco** (for money in Frankfurt between 1837 and 1857) = 233.855 5 g;

1 **Drachme** (in Hesse-Cassel) = 3.728 20 g.

Metric-linked system in Hesse-Darmstadt between 1821 and 1871

						Metric
Schiffslast						2000 kg
40	Centner					50 kg
4000	100	Zollpfund				500 g
128,000	3200	32	Loth			15.625 g
512,000	12,800	128	4	Quentchen		3.906 25 g
2,048,000	51,200	512	16	4	Richtpfennig	976.562 mg

For medical use in Darmstadt; in Frankfurt before 1842; in Frankfurt between 1842 and 1871; in Fulda, Hanau, Kassel and Nuremberg between 1861 and 1871

					Metric	Metric	Metric	Metric
medicinal Pfund					357.828 100 g	357.853 8 g	350.783 250 g	357.663 900 g
12	Unze				29.819 008 g	29.821 15 g	29.231 937 g	29.805 325 g
96	8	Drachme			3.727 376 g	3.727 644 g	3.653 992 g	3.725 666 g
288	24	3	Scrupel		1.242 459 g	1.242 548 g	1.217 997 g	1.241 889 g
5760	480	60	20	Gran	62.123 mg	62.127 mg	60.900 mg	62.094 mg

For gold and silver in Darmstadt; in Fulda and Kassel before 1857; in Frankfurt before 1858, and in Hanau

							Metric	Metric	Metric
Mark							233.939 000 g	233.906 000 g	233.855 500 g
8	Unz						29.242 375 g	29.238 250 g	29.231 937 g
16	2	Loth					14.621 187 g	14.619 125 g	14.615 969 g
64	8	4	Quentchen				3.655 297 g	3.654 781 g	3.653 992 g
256	32	16	4	Pfennig			913.824 mg	913.695 mg	913.498 mg
512	64	32	8	2	Heller		456.912 mg	456.848 mg	456.749 mg
65,536	8192	4096	1024	256	128	Richtpfennig	3.570 mg	3.569 mg	3.568 mg

For diamonds and jewels before 1858

		Metric
frankfurter Karat		205.833 g
4	Grein	51.458 25 g

For diamonds and jewels after 1858

			Metric
holländische Juwelenkarat			205.894 g
4	holländische Grein		51.473 5 g

80.18 Hesse-Homburg

Hesse-Homburg was formed as a separate landgraviate in 1622. In 1806, it was incorporated with Hesse-Darmstadt, but in 1815, it was once again re-established as independent and the district of Meisenheim was added. In 1866, Meisenheim was ceded to the Prussian province of Hesse-Nassau and the rest of Hesse-Nassau was inherited by the grand-duke of Hesse-Darmstadt. Later the same year, Hesse-Nassau was combined with Hesse-Kassel and the free city of Frankfurt to form the Prussian province of Hesse-Nassau.

80.18.1 Currency

–1866: 1 Hesse-Homburg Thaler = 30 Groschen
= 360 Pfennige

80.18.2 Units of Length

In Homburg before 1824

			Metric
Fuß or Schuh			284.61 mm
12	Zoll		23.718 mm
144	12	Linie	1.976 5 mm

Two reported scales before 1821 in Homburg

					Metric	Metric
Malter					112.33 L	114.729 L
4	Simmer				28.082 5 L	28.682 2 L
16	4	Kümpf			7.020 625 L	7.170 562 L
64	16	4	Gescheid		1.755 156 L	1.792 641 L
256	64	16	4	Vierteichen or Mässchen	438.789 mL	448.160 mL

Metric scale used in Meisenheim

				Metric
Malter				100 L
4	Faß			25 L
16	4	Sester		6.25 L
64	16	4	Mässchen	1.562 5 L

In Homburg after 1824

				Metric
Rute				3.451 875 m
10	Fuß			345.188 mm
100	10	Zoll		34.519 mm
1000	100	10	Linie	3.451 9 mm

Other reported measures:

1 Elle (in Homburg) = 547.3 mm.

80.18.3 Units of Area

In Homburg

		Metric
Morgen		1906.470 6 m ²
160	Quadrat-Rute	11.915 441 m ²

Other reported measures:

1 Acker (in Meisenheim) = 2500 m².

80.18.4 Units of Volume

In Homburg

		Metric
Klafter (3 × 12 × 4 Fuß)		3.319 814 m ³
144	Kubikfuß	23.054 dm ³

80.18.5 Units of Dry Capacity

Metric scale used in Homburg after 1821

					Metric
Malter					128 L
4	Simmer				32 L
16	4	Kümpf			8 L
64	16	4	Gescheid		2 L
256	64	16	4	Mässchen	500 mL

80.18.6 Units of Liquid Capacity

Traditional systems in Homburg (*Grosshandel* and *Kleinhandel*) before 1821

					Metric	Metric
Fuder					860.466 L	764.856 L
6	Ohm				143.411 L	127.476 L
120	20	Viertel			7.170 L	6.373 8 L
480	80	4	Maß		1.792 6 L	1.593 45 L
1920	320	16	4	Schoppen	448.16 mL	398.36 mL

For wine before 1821

					Metric
Ohm					156.480 L
20	Viertel				7.824 L
90	4½	Maß			1.738 7 L
360	18	4	Schoppen		434.667 mL

For beer before 1821

					Metric
Ohm					156.480 L
20	Viertel				7.824 L
80	4	Maß			1.956 L
320	16	4	Schoppen		489.0 mL

Metric-linked system after 1821

						Metric
Stück^a						1200 L
1⅞	Zulast					640 L
7½	4	Ohm				160 L
150	80	20	Viertel			8 L
600	320	80	4	Maß		2 L
2400	1280	320	16	4	Schoppen	500 mL

^aUsed for wine

80.18.7 Units of Weight

For merchandise scale, see Frankfurt in *Hesse*.

For gold and silver

				Metric
Mark				233.855 g
16	Loth			14.616 g
288	18	Gran		811.996 mg

For coins in Meisenheim

				Metric
Vereinsmark				233.855 g
16	Loth			14.616 g
288	18	Grän		811.996 mg

For medical use

					Metric
Pfund					350.783 g
12	Unze				29.232 g
96	8	Drachme			3.654 g
288	24	3	Skrupel		1.218 g
5760	480	60	20	Gran	60.90 mg

80.19 Hesse-Nassau

Hesse-Nassau was a province of the Kingdom of Prussia from 1868 until 1918, when it became a province of the Free State of Prussia until 1914.

80.19.1 Currency

The Prussian currency was in use.

80.19.2 Units of Length

Werkmaas system

					Metric
Ruthe					3.517 7 m
2 ¹ / ₂	Klafter				1.688 5 m
12 ¹ / ₂	6	Werkfuß or Werkschuh			281.416 mm
150	72	12	Zoll		23.451 mm
1800	864	144	12	Linie	1.954 mm

Feldmaas system and metric-linked system

				Metric	Metric
Ruthe				3.568 m	5 m
10	Feldfuß or Feldschuh			356.8 mm	500 mm
100	10	Zoll		35.68 mm	50 mm
1000	100	10	Linie	3.568 mm	5 mm

Werkmaas system in Kassel

			Metric
Elle			575.437 32 mm
2	Werkfuß		287.718 66 mm
24	12	Zoll	23.976 56 mm

80.19.3 Units of Area

In Frankfurt

		Metric
Feld Morgen		2036.899 84 m ²
160	Quadratruthe	12.730 624 m ²

In Frankfurt

		Metric
Waldmorgen		3256 m ²
160	Quadrat Waldruthe	20.35 m ²

In Kassel

			Metric
Acker			2387 m ²
150	Quadratruthe		15.913 m ²
15,000	100	Quadratfuß	15.913 dm ²

Metric-linked system in Nassau

			Metric
Morgen			2500 m ²
100	Quadrat Feldruthe		25 m ²
10,000	100	Quadrat Feldfuß	25 dm ²

80.19.4 Units of Volume

For charcoal in Nassau

			Metric
Wagen			5.4 m ³
10	Bütte		0.540 m ³
200	20	Kubikfuß	0.027 m ³

80.19.5 Units of Dry Capacity

Cereals, flour and salt were generally sold by weight.

				Metric
Malter or Achtel				114.36 L
4	Simmer			28.59 L
16	4	Sechter		7.147 5 L
64	16	4	Gescheide	1.786 875 L

80.19.6 Units of Liquid Capacity

For wine

						Metric
Stückfaß						1147.36 L
1⅓	Fuder					860.52 L
8	6	Ohm ^a				143.42 L
160	120	20	Viertel			7.171 L
640	480	80	4	Aichmaß		1.792 75 L
2560	1920	320	16	4	alte Schoppen	448.187 5 mL

^aThe sale of wine was usually granted 2½ Maas excess, called **Bodensatz**, for each Ohm

Jungmaass scale for wine

			Metric
alte Maß			1.792 125 L
1⅞	Jungmaß		1.593 L
4½	4	Schoppen	398.25 mL

For beer

		Metric
Biermaß		1.984 4 L
4	Schoppen	496.1 mL

Other reported measures:

1 Logel (in Rheingau) = 50 L.

80.19.7 Units of Weight

See *Hesse*.

80.20 Hohenzollern-Sigmaringen

The County of Hohenzollern-Sigmaringen was created in 1576, upon the partition of the County of Hohenzollern. After Count Charles I died in 1579, the territory was divided up between his three sons. The areas were named Hohenzollern-Hechingen, Hohenzollern-Sigmaringen and Hohenzollern-Haigerloch. From 1634, Hohenzollern consisted of both Haigerloch and Sigmaringen. In 1806, the surrounding areas of Melchingen, Ringingen and Salmendingen became parts of Hohenzollern, and in 1869, Hohenzollern-Hechingen as well.

Hohenzollern-Hechingen used the same measurement systems even before it became part of Hohenzollern-Sigmaringen.

80.20.1 Currency

1850–1871: 1 Hohenzollern Thaler = 30 Groschen = 360 Pfennige
 1838–1850: 1 Gulden = 60 Kreuzer

Decimalized scale

			Metric
Fuß			286.49 mm
10	Zoll		28.649 mm
100	10	Linie	2.865 mm

80.20.2 Units of Length

Traditional system

				Metric
Meile				7448.75 m
2 166 $\frac{2}{3}$	Ruthe			3.437 9 m
26,000	12	Fuß		286.49 mm
312,000	144	12	Zoll	23.874 mm

Other reported measures:

1 **Garnhaspel** = $1\frac{1}{8}$ or 2 Ellen;1 **Elle** (also divided as 1/2, 1/4, 1/8, and 1/16) = 614.24 m.**80.20.3 Units of Area**

						Metric
Tagwerk, Mannswerk or Jauchert						4727.608 m ²
1 $\frac{1}{2}$	Morgen					3151.738 m ²
6	4	Viertel				787.934 6 m ²
576	384	96	Quadrat-Ruthe			8.207 652 m ²
57,600	38,400	9600	100	Quadratfuß		8.207 652 dm ²
5,760,000	3,840,000	960,000	10,000	100	Quadrat Zoll	8.207 652 cm ²

80.20.4 Units of Volume

Some reported measures:

1 **Klafter** (for firewood, = 6 × 6 × 4 Fuß) = 144 Kubikfuß;1 **Kohlenzuber** (for coal) = 20 Kubikfuß.**80.20.5 Units of Dry Capacity**

						Metric
Scheffel						177.226 4 L
8	Simri					22.153 3 L
32	4	Vierling				5.538 325 L
128	16	4	Mässlein			1.384 581 L
256	32	8	2	Ecklein		692.291 mL
1024	128	32	8	4	Viertelein	173.073 mL

80.20.6 Units of Liquid Capacity

					Metric
Fuder					1763.562 L
6	Eimer				293.927 L
96	16	Imi			18.370 44 L
960	160	10	Maß		1.837 044 L
3840	640	40	4	Schoppen	459.261 mL

Other reported measures:

1 **Trübeichmaß** = 1.917 4 L;

1 **Schenkmaß** = 1.67 L.

80.20.7 Units of Weight

Before 1860

					Metric
Centner					48.643 7 kg
100	schwere Pfund				486.437 g
104	1 $\frac{1}{25}$	leichte Pfund			467.728 g
3328	33 $\frac{1}{25}$	32	Loth		14.164 g
13,312	133 $\frac{1}{25}$	128	4	Quentchen	3.654 g

Between 1860 and 1871

				Metric
Pfund				500.000 g
32	Loth			15.625 g
128	4	Quentchen		3.906 g
512	16	4	Richtpfennig	977 mg

For gold and silver

			Metric
Mark			233.855 g
16	Loth		14.616 g
288	18	Gran	811.996 mg

For medical use

					Metric
Pfund					357.647 g
12	Unze				29.804 g
96	8	Drachme			3.755 g
288	24	3	Skrupel		1.242 g
5760	480	60	20	Gran	62.09 mg

80.21 Lippe (-Detmold)

This territory was established in 1123 and raised to the status of a County in 1528. In 1620, Lippe-Sternberg was reverted to Lippe-Detmold. It became a Principality in 1789, a sovereign state in 1806, and a part of the German Empire in 1871. It is now a part of Nord Rhine-Westfalen.

80.21.1 Currency

1847–1875: 1 Lippe Thaler = 30 Silbergroschen
 = 360 Pfennige
 –1847: 1 Lippe Thaler =
 36 Mariengroschen = 216 Pfennige = 432 Heller

80.21.2 Units of Length

Before 1857

							Metric
Meile							9264.416 000 m
2000	Ruthe						4.632 208 m
4000	2	Lachter					2.316 104 m
16,000	8	4	Elle				579.026 mm
32,000	16	8	2	Werkfuß			289.513 mm
384,000	192	96	24	12	Zoll		24.126 mm
4,608,000	2304	1152	288	144	12	Linie	2.010 5 mm

Between 1857 and 1871

			Metric
Ruthe			4.632 208 m
10	Decimalfuß		463.220 8 m
100	10	Decimalzoll	46.322 08 mm

80.21.3 Units of Area

Legal scale 1825 and 1871

				Metric
Morgen				2574.882 1 m ²
1½	Scheffelsaat			1716.588 1 m ²
120	80	Quadrat-Ruthen		21.457 351 m ²
30,720	20,480	256	Quadrat-Fuß	8.381 8 dm ²

80.21.4 Units of Volume

For stones

			Metric
Bergruthe			24.848 728 m ³
4	Schachtrute (= 16 × 16 × 1 Fuß)		6.212 182 m ³
1024	256	Kubik Fuss	24.266 dm ³

For timber

		Metric
Klafter		5.241 529 m ³
216	Kubik Fuss	24.266 dm ³

Other reported measures:

- 1 Scheffel (for lime) = 177.166 723 L;
- 1 Scheffel (for charcoal) = 88.583 361 L;
- 1 Scheffel (for coal) = 54.961 500 L.

80.21.5 Units of Dry Capacity

For cereals

							Metric
Hafer-Scheffel							51.673 627 L
1⅓	Roggen-Scheffel ^a						44.291 681 L
1⅓ ₁₁	1⅓ ₁₁	Himten					40.700 707 L
4⅔	4	3⅔	Spint				11.072 920 L
7	6	5½	1½	grosse Metzen			7.381 947 L
9⅓	8	7⅓	2	1⅓	kleine Metzen		5.536 460 L
28	24	22	6	4	3	Mehlmetzen ^b	1.845 487 L

^aFor rye
^bFor meal

For fruit

				Metric
Hartkorn-Scheffel				44.292 L
6	grosse Metze			7.382 L
8	1⅓	kleine Metze		5.536 5 L
24	4	3	Mahlmetze	1.845 5 L

For fruit

		Metric
Hafer-Scheffel		51.674 L
7	grosse Roden-Metze	7.382 L

Some other reported measures:

- 1 Himten (in Minden) = 29.060 L.

80.21.6 Units of Liquid Capacity

Oil and other liquids, except beer and wine, were sold by weight.

For wine

									Metric
Fass									891.76 L
4	Oxhoft								222.946 963 L
6	1½	Ohm							148.631 309 L
6 ¹³ / ₂₅	1 ³³ / ₅₀	1 ⁷ / ₂₅	Bier-Ohm ^a						137.621 582 L
12	3	2	1 ²³ / ₂₇	Tonne-Bier ^a					74.315 654 L
24	6	4	3 ¹⁹ / ₂₇	2	Anker				37.157 827 L
120	30	20	18 ¹⁴ / ₂₇	10	5	Viertel visirmaß			7.431 565 L
648	162	108	100	54	27	5 ² / ₃	Kanne		1.376 216 L
1296	324	216	200	108	54	10 ² / ₃	2	Halbe	688.108 mL
2592	648	432	400	216	108	21 ² / ₃	4	2 Ort	344.054 mL

^aFor beer

80.21.7 Units of Weight

Before 1825

				Metric
Centner				50.480 280 kg
108	Pfund			467.410 g
3456	32	Loth		14.607 g
13,824	128	4	Quentchen	3.652 g

Metric-linked system between 1825 and 1871

						Metric
Centner						50 kg
100	Pfund					500 g
3000	30	Neuloth				16.67 g
30,000	300	10	Quentchen			1.667 g
300,000	3000	100	10	Cent		166.67 mg
3,000,000	30,000	1000	100	10	Korn	16.667 mg

For medical use

					Metric
Pfund					350.783 g
12	Unze				29.232 g
96	8	Drachme			3.654 g
288	24	3	Skrupel		1.218 g
5760	480	60	20	Gran	60.90 mg

80.22 Lower Saxony

Lower Saxony was formed after World War II by a number of small principalities, duchies,

counties and bishoprics incorporated in the British zone of occupation. See also *Hanover* and *Oldenburg*.

80.22.1 Currency

–1840: 1 Thaler = 27 Schaapen = 54 Stüber = 540 Witen

80.22.2 Units of Length

Other reported measures:

In East Frisia

		Metric
Ruthe		3.766 242 m
12	rheinische Fuß	313.853 mm

Old system and *Rheinische* system at Emden

		Metric	Metric
Rute		3.505	3.766
		136 m	242 m
3 $\frac{1}{2}$	Haspelfaden	1.095	–
		355 m	
12	3 $\frac{3}{4}$ Fuß	292.095 mm	313.853 mm

At Lüneburg

		Metric
Ruthe		4.671 912 m
16	Hannover Fuß	291.994 5 mm

In Osnabrück

		Metric
Fuß		279.300 mm
12	Zoll	23.275 mm

- 1 **Haspel** (at Osnabrück) = 1.849 933 m;
 1 **Legge Elle** (at Osnabrück) = 1.221 750 m;
 1 **Gesetz Elle** (legal) = 1.220 900 m;
 1 **Elle** (at Emden) = 678.78 mm or 678.850 mm;
 1 **Elle** (for paintings at Osnabrück) = 638.40 mm;
 1 **Elle** (at Munden) = 584.7 mm;
 1 **Elle** (at Celle and Osnabrück) = 584.189 mm;
 1 **Elle** (at Nienbourg, Osterode and Stade) = 582.0 mm;
 1 **Elle** (at Verden an der Aller) = 578.4 mm;
 1 **Elle** (in Rinteln) = 2 Fuss = 577.5 mm;
 1 **Fuss** (at Emden) = 292.13 mm;
 1 **Fuss** (in Rinteln) = 288.75 mm.

For coarse yarn in Osnabrück

					Metric
Bund					20,692.19 m
12	Stück				1724.36 m
240	20	Gebinde			86.217 m
12,000	1000	50	Faden		1.724 m
24,000	2000	100	2	alte Kölner Elle	862.17 mm

For finer yarn in Osnabrück

					Metric
Bund					29,913.20 m
20	Stück				1495.66 m
400	20	Gebinde			74.783 m
20,000	1000	50	Faden		1.496 m
40,000	2000	100	2	alte Kölner Elle	747.83 mm

80.22.3 Units of Area

In Emden

			Metric
Diemt, Demat, Demath, Diemat, or Morgen			5673.83 m ²
400	prussian Quadratruthe		14.185 m ²
450	1⅞	Emdener Quadratrute	12.608 m ²

In East Frisia, based on [HASE, p. 89]

		Metric
Diemath or Diemet		5 673.83 m ²
400	prussian Quadratruthe	14.185 m ²

In Hadeln

		Metric
Morgen		11,780 m ²
540	Quadratruthe	21.8 m ²

Two reported scales in Jever

				Metric
Matt Binnenland				5792.04 m ²
1½	Grase			3861.360 m ²
3	2	Hundert		1930.68 m ²
300	200	100	Quadratrute	19.307 m ²

In Jever

		Metric
Matt Grodenland		4728.189 m ²
1½	Grase	3152.126 m ²

80.22.4 Units of Dry Capacity

At Emden (based on [CHEL], [MART3] and [DOUR])

						Metric	Metric	Metric
Last						3283.68 L	2990.559 898 L	2867.10 L
15	Tonne					218.912 L	199.370 660 L	191.14 L
30	2	Sac				109.456 L	99.685 330 L	95.57 L
60	4	2	Vierup or Werp			54.728 L	49.842 665 L	47.79 L
120	8	4	2	Scheffel^a		27.364 L	24.921 332 L	23.89 L
2160	144	72	36	18	Krug	1.520 2 L	1.384 518 L	1.327 L

^aAccording to Eytelwein = 27.36 L

At Lüneburg

		Metric
Himt		31.12 L
4	Spint	7.78 L

In Osnabrück

						Metric
Last						2870.300 000 L
1 ⁷ / ₁₈	Fuder					2066.616 000 L
8 ² / ₃	6	Malter				344.436 000 L
100	72	12	Scheffel			28.703 000 L
400	288	48	4	Viertel		7.175 750 L
1600	1152	192	16	4	Becher	1.793 937 L

80.22.5 Units of Liquid Capacity

In Emden

		Metric
Ort		446.0 mL
4	Viertelort	111.5 mL

1 Ohm = 120 Mengel

For wine in Osnabrück

						Metric
Fuder						819.600 000 L
6	Ohm					136.600 000 L
168	28	Viertel				4.878 571 L
672	112	4	Kanne			1.219 643 L
2688	448	16	4	Ort		304.910 7 mL
10,752	1792	64	16	4	Helfchen	76.227 68 mL

In Rinteln

				Metric
Oxhoft				245.177 28 L
1 ¹ / ₂	Ohm			163.451 52 L
6	4	Anker		40.862 88 L
162	108	27	Mass	1.513 44 L

Other reported measures:

1 **Anker** (in Emden) = 38.939 583 L.

80.22.6 Units of Weight

At Emden, based on [CHEL], [MART3] and [DOUR]

						Metric	Metric	Metric
Commerzlast						2810.934 kg	2806.266 000 kg	2800.80 kg
1 ¹ / ₂	Roggenlast					1873.956 kg	1870.844 000 kg	1867.20 kg
20	13 ² / ₃	Schiffpfund				140.547 kg	140.313 300 kg	140.04 kg
60	40	3	Zentner			46.849 kg	46.771 100 kg	46.68 kg
6000	4000	300	100	Pfund		468.489 g	467.711 g	496.80 g
192,000	128,000	9600	3200	32	Loth	14.640 g	14.616 g	15.525 g

For salt in Lüneburg

			Metric
Last			1876.810 kg
12	Tonne or Schiffspfund		156.401 kg
72	6	Lüneburger Himten	26.067 kg

Other reported measures:

1 **Faden** (metric unit for firewood in Lüneburg)
= 3000 Pfund = 1500 kg.

80.23 Lübeck (Hansestadt Lübeck)

Lübeck was built at its present site in 1143. The town was part of the Duchy of Saxony until 1192, of the County of Holstein until 1217, and part of Denmark until 1227. In 1226, it was elevated to

the status of an Imperial Free City, and in 1241, joined Hamburg to form the nucleus of what was to become the Hanseatic League. Since 1937, the city has been part of Schleswig-Holstein.

80.23.1 Currency

1856–1872: 1 Lübeck Thaler Kurant = $2\frac{1}{2}$ Mark = 40 Schillinge = 480 Pfennige

–1856: 1 Lübeck Thaler Kurant = 3 Mark = 48 Schillinge = 576 Pfennige

80.23.2 Units of Quantity

1 **Hundert** = 12 Zwölfter = 120.

80.23.3 Units of Length

Before 1872, based on [MART3]

						Metric
Meile						7363.025 920 m
1600	Ruthe					4.601 891 m
12,800	8	Elle				575.236 mm
25,600	16	2	Fuß			287.618 mm
307,200	192	24	12	Zoll		23.968 mm
3,686,400	2304	288	144	12	Linie	1.996 7 mm

Other reported measures:

1 **Grad des Aequators** = 15 Meilen = 111,085.5 m;

1 **Geestrute** = 16 Fuss = 4.583 7 m.

80.23.4 Units of Area

Outside of the inner dike

					Metric
Last					142,566.39 m ²
24	Tonne				5940.266 m ²
96	4	Scheffel Aussaat			1485.066 m ²
112	$4\frac{2}{3}$	$1\frac{1}{2}$	Morgen		1272.914 m ²
6720	280	70	60	Quadratruthe	21.215 236 m ²

Inside of the inner dike

				Metric
Last				122,199.76 m ²
24	Tonne			5091.657 m ²
96	4	Scheffel Aussaat		1272.914 m ²
5760	240	60	Quadratruthe	21.215 236 m ²

System reported by [MART3]

					Metric
Last					121,981.839 1 m ²
24	Tonne				5082.576 6 m ²
96	4	Scheffel			1270.644 2 m ²
6720	280	70	Quadratruthe		21.177 403 m ²
1,720,320	71,680	17,920	256	Quadratfuss	8.272 4 dm ²

Other reported measures:

1 **Geestrute** = 256 Quadratfuß = 21.024 m².

80.23.5 Units of Volume

Some reported measures:

- 1 **Faden** (for firewood, $6\frac{7}{8} \times 6\frac{7}{8} \times 6\frac{7}{8}$ Fuß) = 292.604 Kubikfuß;
1 **Faden** (for firewood, $14 \times 4 \times 3$ Fuß) = 168 Kubikfuß.

Other reported measures:

- 1 **Hofertonne** = 158.056 L;
1 **Steinkohlentonne** (for coal) = 38 Stübchen = 139.206 L or 138.225 L.

80.23.6 Units of Dry Capacity

For general use, wheat and rye; for other cereals, except oats; for oats, based on [WAGN2], and for oats, based on [MART3]

					Metric	Metric	Metric	Metric
Last					3330.624 L	3200 L	3800.8 L	3793.344 L
8	Drömt				416.328 L	400 L	475.1 L	474.169 L
24	3	Tonne			138.776 L	133.33 L	158.37 L	158.056 L
96	12	4	Scheffel		34.694 L	33.33 L	39.59 L	39.514 L
384	48	16	4	Faß	8.673 5 L	8.33 L	9.90 L	9.878 5 L

For salt

			Metric
Saltzlast			2553.525 L
18	Salztonne		141.862 5 L
702	39	Stübchen	3.637 5 L

80.23.7 Units of Liquid Capacity

Customary system

										Metric
Fuder										873.005 L
4	Oxhoft^a									218.250 L
6	1½	Ohm								145.500 L
24	6	4	Anker							36.375 L
120	30	20	5	Viertel						7.275 L
240	60	40	10	2	Stübchen					3.637 500 L
480	120	80	20	4	2	Kanne				1.818 750 L
960	240	160	40	8	4	2	Quartier			909.375 mL
1920	480	320	80	16	8	4	2	Plank		454.687 mL
3840	960	640	160	32	16	8	4	2	Ort	227.344 mL

^aReported as **Faß** when used for brandy

For beer, based on [MART3]

										Metric
Bier Faß^a										149.016 000 L
20		Viertel								7.450 800 L
40		2		Stübchen						3.725 400 L
80		4		2		Kanne				1.862 700 L
160		8		4		2		Quartier		931.350 mL

^a[WAGN2] reported it as 147.02 L

Other reported measures:

1 **Kros** or **Kroos** (for beer and wine) =
940.960 L.

80.23.8 Units of Weight

Mercantile upper scale used before 1820

										Metric
Commerzlast										3049.380 000 kg
21⅔	Schiffspfund									142.304 400 kg
53⅔		Centner								56.921 760 kg
272⅔ ₁₁	12⅔ ₁₁	5⅔ ₁₁	Stein							11.181 060 kg
428⅔	20	8	1⅔	Liespfund						7.115 220 kg
6000	280	112	22	14	Pfund					508.230 g

Mercantile lower scale used before 1820

										Metric
Pfund										508.230 g
2	Mark									254.115 g
16	8	Unz								31.764 g
32	16	2	Loth							15.882 g
256	128	16	8	Quentchen						1.985 g
512	256	32	16	2	Reichpfennig					993 mg

Stadtgewicht used between 1820 and 1861

									Metric
Commerzlast									2918.844 000 L
1 $\frac{1}{5}$	Schiffslast								2432.370 000 L
21 $\frac{3}{7}$	17 $\frac{6}{7}$	Schiffspfund							136.212 720 L
53 $\frac{3}{7}$	44 $\frac{1}{4}$	2 $\frac{1}{2}$	Centner						54.485 088 L
272 $\frac{1}{11}$	227 $\frac{1}{11}$	12 $\frac{1}{11}$	5 $\frac{1}{11}$	Stein					10.702 428 L
428 $\frac{1}{2}$	357 $\frac{1}{2}$	20	8	1 $\frac{1}{2}$	Liespfund				6.810 636 L
6000	5000	280	112	22	14	Pfund			486.474 mL
192,000	160,000	8960	3584	704	448	32	Loth		15.202 mL
768,000	640,000	35,840	14,336	2816	1792	128	4	Quentchen	3.800 mL

Normalgewicht used between 1820 and 1861

				Metric
Centner				54.287 274 L
112	Pfund			484.708 mL
3584	32	Loth		15.147 mL
14,336	128	4	Quentchen	3.787 mL

Metric-linked system between 1860 and 1872

						Metric
Schiffslast						2000 kg
40	Centner					50 kg
4000	100	Pfund				500 g
40,000	1000	10	Zehntelpfund			50 g
400,000	10,000	100	10	Hundertstel or Quint		5 g
4,000,000	100,000	1000	100	10	Tausendstel	500 mg

For medical use before 1860 and between 1861 and 1872

					Metric	Metric
Medicinal Pfund					357.853 800 g	360 g
12	Unze				29.821 150 g	30 g
96	8	Drachme			3.727 644 g	3.75 g
288	24	3	Scrupel		1.242 548 g	1.25 g
5760	480	60	20	Gran	62.127 mg	6.25 mg

For gold and silver before 1856

								Metric
Pfund								467.364 200 g
2	Mark							233.682 100 g
16	8	Unze						29.210 262 g
32	16	2	Loth					14.605 131 g
128	64	8	4	Quentchen				3.651 283 g
512	256	32	16	4	Pfennig			912.821 mg
1024	512	64	32	8	2	Heller		456.410 mg
131,072	65,536	8192	4096	1024	256	128	Richtpfennig	3.566 mg

For gold and silver between 1856 and 1872

					Metric
Mark					233.855 500 g
8	Unze				29.231 937 g
16	2	Loth			14.615 969 g
64	8	4	Quentchen		3.653 992 g
256	32	16	4	Pfennig	913.498 mg

80.24 Mecklenburg-(Schwerin)

Mecklenburg-Schwerin was established in 1352, after the separation of Mecklenburg-Stargard. In 1592, the Duchy of Mecklenburg was divided into Mecklenburg-Schwerin and Mecklenburg-Güstrow (whose line died off in 1695). In 1658, Mecklenburg-Schwerin was divided into Mecklenburg-Schwerin (whose line died off in 1692), Mecklenburg-Grabow, Mecklenburg-Mirow (whose line died off in 1675) and Mecklenburg-Strelitz. In 1701, after a few years of dispute, the majority of the Mecklenburg territory became Mecklenburg-(Grabow-) Schwerin, and the rest became Mecklenburg-Strelitz. In 1934, Mecklenburg-Schwerin and Mecklenburg-Strelitz formed the state of Mecklenburg. It is now part of Mecklenburg-Vorpommern.

Main sources: [MART3], [RAAB], [ROTT2], and [WAGN2]

80.24.1 Currencies

- 1857–1873: 1 Mecklenburg Vereinsthaler = 48 Shillinge = 576 Pfennige
 1848–1857: 1 Mecklenburg Thaler = 2 Mark = 48 Shillinge = 576 Pfennige
 1763–1848: 1 Mecklenburg Reichsthaler = 1½ Gulden = 3 Mark = 24 Groschen = 48 Schillinge = 96 Sechslinge = 192 Dreilinge = 576 Pfennige

80.24.2 Units of Length

Lübeck-linked system in Mecklenburg before 1757

			Metric
Ruthe			4.601 832 m
8	Elle		575.229 mm
16	2	Fuß	287.614 5 mm

In Mecklenburg after 1757

			Metric
Ruthe			4.655 971 m
8	Elle		581.996 mm
16	2	Fuß	290.998 mm

Hamburger-linked system for construction in Mecklenburg, based on [MART3]

							Metric
Ruthe							4.583 948 m
2⅔	Faden						1.718 943 m
8	3	Elle					572.981 mm
16	6	2	Fuß				286.490 mm
192	72	24	12	Zoll			23.874 mm
2304	864	288	144	12	Linie		1.989 µm
23,040	8640	2880	1440	120	10	Punkt	198.9 µm

System for road building in Mecklenburg

					Metric
Rheinländische Meile					7532.484 000 m
24,000	Decimalfuß				313.853 mm
288,000	12	Decimalzoll			26.154 5 mm
2,880,000	120	10	Decimallinie		2.615 45 mm
28,800,000	1200	100	10	Theile	261.545 µm

At Rostock

					Metric
Ruthe					4.603 191 m
8	Elle^a				575.399 mm
10	1¼	geometrische Kettenfuß^b			460.319 mm
16	2	1⅔	Fuß		287.699 mm
192	24	19⅕	12	Zoll	23.975 mm

^aThe Elle, as used in Hamburg, = 573.0 mm was also in use

^bFor surveying

Other reported measures:

1 Elle (at Strelitz) = 690.906 mm;

1 Elle (at Wismar) = 581.884 mm.

80.24.3 Units of Area

In Mecklenburg before 1862

					Metric
Morgen					6427.8 m ²
3	Waldmorgen or Forstmorgen				2142.6 m ²
6	2	Scheffel-Saat			1071.3 m ²
300	100	50	Quadratruthe		21.426 m ²
76,800	25,600	12,800	256	Quadratfuss	8.369 dm ²

In Mecklenburg between 1862 and 1872

							Metric
Hufe							126,078.300 m ²
10	Last Aussaat						12,607.830 m ²
20	2	Morgen					6303.915 m ²
60	6	3	Waldmorgen^a				2101.305 m ²
100	10	5	1 2/3	Scheffel-Aussaat^b			1260.783 m ²
6000	600	300	100	60	Quadratruthe		21.013 m ²
1,536,000	153,600	76,800	25,600	15,360	256	Quadratfuss	8.208 dm ²

^aFor forests

^bThe size of a Scheffel was dependent on the quality of the soil

At Rostock after 1755

					Metric
Hufe					477,426.300 m ²
300	Scheffel				1591.421 m ²
22,500	75	Quadratruthe			21.218 95 m ²

At Rostock after 1808

						Metric
Hufe						954,852.750 m ²
1 $\frac{1}{3}$	Dreiviertel Hufe					716,139.562 m ²
2	1 $\frac{1}{2}$	Halbe Hufe				477,426.375 m ²
4	3	2	Viertel Hufe			238,713.187 m ²
600	450	300	150	Scheffel		1591.421 m ²
45,000	33,750	22,500	11,250	75	Quadratruthe	21.218 95 m ²

In Schwerin

						Metric
Hufe						130,070.016 m ²
10	Last Aussaat					13,007.001 6 m ²
25	2 $\frac{1}{2}$	Morgen				5202.800 64 m ²
100	10	4	Scheffel-Aussaat			1300.700 2 m ²
6000	600	240	60	Quadratruthe		21.678 336 m ²
1,536,000	153,600	61,440	15,360	256	Quadratfuss	8.468 1 dm ²

80.24.4 Units of Volume

For firewood in Mecklenburg

				Metric
Faden ^a (7 × 7 × 3 Fuß)				3.456 593 m ³
147	Kubikfuß			23.514 dm ³
254,016	1 728	Kubikzoll		13.607 7 cm ³

^aThis was the so-called “normirende Faden” (the usual value), but the sizes of the billets varied a lot. There were billets that measured 7 × 8 × 3 Fuß, 7 × 7 × 3 Fuß, 6 × 7 × 3 Fuß and 6 × 6 × 3 Fuß. Even the length of the billets sometimes varied between 2 and 6 Fuß. At Rostock, 1 **Faden** (7 × 7 × 2 Fuß) = 98 Kubikfuß

80.24.5 Units of Dry Capacity

In Boizenburg

						Metric
Last						3733.344 L
4	Wispel					933.336 L
24	6	Sack				155.556 L
96	24	4	Scheffel			38.889 L
144	36	6	1 $\frac{1}{2}$	Himpten		25.926 L
864	216	36	9	6	Spint	4.321 L

For cereals in Güstrow, Parchim, Schwerin, Waren and Wismar

					Metric	Metric	Metric	Metric	Metric
Last					3824.832 L	5253.888 L	3882.720 L	5472.864 L	3820.416 L
8	Drömt				478.104 L	656.736 L	485.340 L	684.108 L	477.552 L
96	12	Scheffel ^a			39.842 L	54.728 L	40.445 L	57.009 L	39.796 L
384	48	4	Faß		9.960 L	13.682 L	10.111 L	14.252 L	9.949 L
1536	192	16	4	Metze	2.490 L	3.420 L	2.528 L	3.563 L	2.487 L

^a[MART3] reported 1 **scheffel** (in Wismar) as 38.284 220 L

For wheat and rye, and for oats in Rostock and Wismar

							Metric	Metric
Last							3733.344 L	4206.4 L
3	Whispel						1244.448 L	1402.9 L
8	2⅔	Drömt					466.669 L	525.8 L
24	8	3	Tonne				155.556 L	175.28 L
96	32	12	4	Scheffel			38.889 L	43.82 L
384	128	48	16	4	Faß or Viertel		9.722 L	10.95 L
1536	512	192	64	16	4	Metze or Spint	2.430 L	2.74 L

For cereals, except for oats, in Mecklenburg

							Metric
Last							3853.710 000 L
4	Whispel						963.427 500 L
8	2	Drömt					481.713 375 L
16	4	2	Sack				240.856 875 L
100	25	12½	6¼	Scheffel			38.537 100 L
400	100	50	25	4	Faß or Viertel		9.634 275 L
1600	400	200	100	16	4	Spint	2.408 569 L

For oats in Mecklenburg

							Metric
Last							4162.006 800 L
4	Whispel						1040.501 700 L
8	2	Drömt					520.250 850 L
16	4	2	Sack				260.125 425 L
100	27	13½	6¼	Scheffel			38.537 100 L
432	108	54	27	4	Faß or Viertel		9.634 275 L
1728	432	216	108	16	4	Spint	2.408 569 L

For salt and coal

			Metric
Last			2774.671 200 L
12	Tonne		231.222 600 L
72	6	Scheffel	38.537 100 L

Other reported measures:

1 **Tonne** (for potatoes in Mecklenburg) = 115.611 300 L.

80.24.6 Units of Liquid Capacity

Upper scale in Mecklenburg before 1862 and after 1862

							Metric	Metric
Fuder							930.72 L	869.472 L
4	Oxhoft						232.68 L	217.368 L
6	1½	Ahm					155.12 L	144.912 L
24	6	4	Anker				38.78 L	36.228 L
30	7½	5	1¼	Eimer			31.024 L	28.982 4 L
120	30	20	5	4	Viertel		7.756 L	7.245 6 L
240	60	40	10	8	2	Stübchen	3.878 L	3.622 8 L

Lower scale in Mecklenburg before 1862 and after 1862

							Metric	Metric
Stübchen							3.878 L	3.622 8 L
2	Kanne						1.939 L	1.811 4 L
4	2	Pott or Quartier					969.50 mL	905.70 mL
8	4	2	Oeßel, Plank or Stück				484.75 mL	452.85 mL
16	8	4	2	Pegel or Ort			242.375 mL	226.425 mL

Upper scale in Rostock (legal system and old system)

					Metric	Metric
Fuder					868.84 L	790.08 L
4	Oxhoft				217.21 L	197.52 L
6	1½	Ahm			144.81 L	131.68 L
24	6	4	Anker		36.20 L	32.92 L

Lower scale in Rostock (legal system and old system)

								Metric	Metric
Anker								36.20 L	32.92 L
1¼	Eimer							28.96 L	26.34 L
5	4	Viertel						7.24 L	6.58 L
10	8	2	Stübchen					3.62 L	3.29 L
20	16	4	2	Kanne				1.810 L	1.646 L
40	32	8	4	2	Quartier			905 mL	823 mL
80	64	16	8	4	2	Oeßel		452.5 mL	411.5 mL
160	128	32	16	8	4	2	Ort	226.25 mL	205.62 mL

For wine in Schwerin

										Metric
Fuder										888.313 440 L
4	Oxhoft									222.078 360 L
6	1½	Ohm								148.052 240 L
24	6	4	Anker							37.013 060 L
26¼	7½	5	1¼	Eimer						29.610 448 L
105	30	20	5	4	Viertel					7.402 612 L
210	60	40	10	8	2	Stübchen				3.701 306 L
420	120	80	20	16	4	2	Kanne			1.850 653 L
840	240	160	40	32	8	4	2	Pott		925.326 mL
1680	420	320	80	64	16	8	4	2	Oeßel	462.663 mL
3360	840	640	160	128	32	16	8	4	2	Ort 231.332 mL

For beer in Schwerin

			Metric
Bier Tonne			118.441 792 L
4	Viertel		29.610 448 L
64	16	Kanne	1.850 653 L

80.24.7 Units of Weight

In Mecklenburg before 1861

					Metric
Centner					54.287 kg
8	Liespfund				6.786 kg
112	14	Pfund			484.707 8 g
3584	448	32	Loth		15.147 g
14,336	1792	128	4	Quentchen	3.787 g

For goods transported on land in Mecklenburg before 1861

							Metric
Schiffslast							1938.831 2 kg
12½	Schiffspfund						155.106 496 kg
31¼	2½	Centner					62.042 598 kg
200	16	6⅔	grosse Stein				9.694 156 kg
250	20	8	1¼	Liespfund			7.755 325 kg
400	32	12⅔	2	1⅓	kleine Stein		4.847 078 kg
4000	320	128	20	16	10	Pfund	484.707 8 g

For mercantile use before 1862 in Rostock (legal scale and town scale, about 5% higher values)

						Metric	Metric
Pfund						484.4 g	508.6 g
2	Mark					242.2 g	254.3 g
16	8	Onze				30.275 g	31.787 g
32	16	2	Loth			15.137 g	15.894 g
128	64	8	4	Quentchen		3.784 g	3.973 g
512	256	32	16	4	Pfennig	946.1 mg	993.4 mg

Stadtgewicht (town scale) in Schwerin before 1861

										Metric
Last^a	Schiffslast									3049.373 400 kg
1½	2									2032.915 600 kg
3		Tonne								1016.457 800 kg
18¾	12½	6¼	Schiffs- pfund							162.633 248 kg
53⅞	35⅞	17⅞	2⅞	Centner						56.921 637 kg
375	250	125	20	7	Liespfund					8.131 662 kg
6000	4000	2000	320	112	16	Pfund Stadtgewicht^b				508.229 g
192,000	128,000	64,000	10,240	3584	512	32	Loth			15.882 g
768,000	512,000	256,000	40,960	14,336	2048	128	4	Quentchen		3.970 g
3,072,000	2,048,000	1,024,000	163,840	57,344	8192	512	16	4	Pfennig	993 mg

^aFor rye

^bAlso reported as **Pfund Waagegewicht**

Stadtgewicht (town scale) in Schwerin before 1861

				Metric
Centner				50.822 890 kg
5	Stein^a			10.164 578 kg
10	2	Stein^b		5.082 289 kg
100	20	10	Pfund	508.229 g

^aFor wool (as **schwere Stein Wolle**) and hemp (as **Stein Flachs**)

^bFor wool (as **leichte Stein Wolle**) and plumage (as **Stein Federn**)

Krämergewicht (commercial scale) in Schwerin before 1861

					Metric
Centner					54.211 091 kg
112	Pfund Krämergewicht				484.027 6 g
3584	32	Loth			15.126 g
14,336	128	4	Quentchen		3.781 g
57,344	512	16	4	Pfennig	945 mg

For gold and silver before 1861

							Metric
Mark							233.854 890 g
8	Unze						29.231 861 g
16	2	Loth					14.616 931 g
64	8	4	Quentchen				3.653 983 g
256	32	16	4	Pfennig			913.496 mg
512	64	32	8	2	Heller		456.748 mg
65,536	8192	4096	1024	256	128	Richtpfennig	3.568 mg

For diamonds and jewels before 1861

		Metric
Karat		205.858 mg
4	Gran	51.464 mg

For medical use before 1861

					Metric
Medicinal Pfund					350.783 000 g
12	Unze				29.231 917 g
96	8	Drachme			3.653 615 g
288	24	3	Skrupel		1.217 872 g
5760	480	60	20	Gran	60.894 mg

Some other reported measures:

1 **Pfund** (at Wismar) = 494.09 g.

80.25.2 Units of Length

							Metric
Erdruthe							5.021 656 m
$1\frac{1}{3}$	Bauruthe						3.766 242 m
$2\frac{2}{3}$	2	Faden					1.883 08 m
–	–	$2\frac{39}{53}$	Elle^a				693.08 mm
16	12	6	$2\frac{7}{24}$	Werkfuß or Baufuß			313.853 mm
192	144	72	$26\frac{1}{2}$	12	Werkzoll		26.154 mm
2304	1728	864	318	144	12	Linie	2.179 5 mm

^aIn Ratzeburg, reported as 582.20 mm

Other reported measures:

- 1 **Feldruthe** = 16 Feldfuß = 4.656 000 m;
1 **Feldfuß** = 291.000 mm.

80.25.3 Units of Area

Before 1872

		Metric
Morgen or Scheffel-Saat		2167.833 6 m ²
100	Quadrat-Feldruthe	21.678 336 m ²

80.25.4 Units of Volume

- 1 **Faden** (for firewood, 6 × 6 × 4 Fuss) =
144 Kubikfuss.

80.25.5 Units of Dry Capacity

							Metric
Last							5472.760 000 L
$3\frac{19}{27}$	Wispel^a						1477.645 200 L
4	$1\frac{7}{25}$	Wispel					1368.190 000 L
8	$2\frac{7}{25}$	2	Drömt				684.095 000 L
100	27	25	$12\frac{1}{2}$	Scheffel^b			54.727 600 L
1600	432	400	200	16	Metze		3.420 475 L

^aFor oats

^bIn Strelitz, reported as 51.65 L

80.25.6 Units of Liquid Capacity

Before 1872

									Metric
Fuder									929.021 107 L
4	Oxhoft								232.255 277 L
6	1½	Ohm							154.836 651 L
24	6	4	Anker						38.709 213 L
30	7½	5	1¼	Eimer					30.967 370 L
120	30	20	5	4	Viertel				7.741 843 L
240	60	40	10	8	2	Stübchen			3.870 921 L
480	120	80	20	16	4	2	Kanne		1.935 461 L
960	240	160	40	32	8	4	2	Pott	967.730 mL
1920	480	320	80	64	16	8	4	2	Oessel 483.865 mL

Metric-linked system after 1872

				Metric
Kanne				230 mL
2	Pot			115 mL
4	2	Oeßel, Plank or Stück		57.5 mL
8	4	2	Pegel or Ort	28.75 mL

80.25.7 Units of Weight

Before 1861

									Metric
Schiffpfund									135.690 646 kg
2 ³⁰ / ₅₅	Centner								53.307 039 kg
12 ⁹ / ₁₁	5	schwere Stein							10.661 408 kg
20	7 ⁷ / ₇	1 ⁴ / ₇	Liespfund						6.784 532 kg
25 ⁹ / ₁₁	10	2	1 ¹ / ₁₁	leichte Stein					5.330 704 kg
280	110	22	14	11	Pfund				484.609 g
8960	3520	704	448	352	32	Loth			15.144 g
35,840	14,080	2816	1792	1408	128	4	Quentchen		3.786 g
143,360	56,320	11,264	7168	5632	512	16	4	Pfennig	946 mg

Alternative system before 1861

							Metric
Centner							51.448 21 kg
5½	schwere Stein						9.354 22 kg
7 ⁷ / ₇	1 ⁴ / ₇	Liespfund					6.547 95 kg
11	2	1 ¹ / ₁₁	leichte Stein				4.677 11 kg
110	20	14	10	Pfund			467.711 g
3520	640	448	352	32	Loth		14.616 g
14,080	2560	1792	1408	128	4	Quentchen	3.654 g

Metric-linked system used between 1861 and 1872

								Metric
Schiffpfund								2000 kg
40	Centner							50 kg
200	5	Stein						10 kg
4000	100	20	Pfund					500 g
120,000	3000	600	30	Loth				16.667 g
1,200,000	30,000	6000	300	10	Quentchen			1.667 g
12,000,000	300,000	60,000	3000	100	10	Zent		167 mg
120,000,000	3,000,000	600,000	30,000	1000	100	10	Korn	16.7 mg

For medical use

				Metric
Medicinal Pfund				350.783 g
8	Drachma			43.848 g
24	3	Skrupel		14.616 g
480	60	20	Gran	730.8 mg

For gold and silver

				Metric
Mark				233.855 500 g
16	Loth			14.615 969 g
256	16	Sechzehntel Loth		913.498 mg
65,536	4096	256	Richtpfennig	3.568 mg

80.26 Nassau (-Weilburg)

This County, later the Principality of Nassau-Weilburg, was established in 1125. Having been divided several times, Nassau was not reunited as a single state until 1815.

80.26.1 Currency

1753–1858: 1 Gulden = 60 Kreuzer =
240 Pfennig = 480 Heller

80.26.2 Units of Length

In Wiesbaden before 1853

			Metric
Ruthe			4.60 m
$8^{31/1111}$	Elle		555.5 mm
16	–	Fuß	287.5 mm

Metric-linked system used for construction between 1853 and 1872

									Metric
Meile									1000 m
200	Feldruthe								5 m
$333\frac{1}{3}$	$1\frac{1}{3}$	Werk-Ruthe							3 m
$1666\frac{2}{3}$	$8\frac{2}{3}$	5	Elle						600 mm
2000	10	6	$1\frac{1}{5}$	Feldschuh					500 mm
$3333\frac{1}{3}$	$16\frac{2}{3}$	10	2	$1\frac{1}{3}$	Werkfuß or Normalfuß				300 mm
$33,333\frac{1}{3}$	$166\frac{2}{3}$	100	20	$16\frac{2}{3}$	10	Zoll			30 mm
$333,333\frac{1}{3}$	$1666\frac{2}{3}$	1000	200	$166\frac{2}{3}$	100	10	Linie		3 mm
$3,333,333\frac{1}{3}$	$16,666\frac{2}{3}$	10,000	2000	$1666\frac{2}{3}$	1000	100	10	Theil	300 µm

Metric-linked system used for surveying after 1850

				Metric
Feld-Ruthe				5 m
10	Feldfuß			500 mm
100	10	Zoll		50 mm
1000	100	10	Linie	5 mm

80.26.3 Units of Area

Metric-linked system after 1853

						Metric
Morgen						2500 m ²
100	Quadrat Feldruthe					25 m ²
$277\frac{2}{3}$	$2\frac{2}{3}$	Quadrat Werkruthe				9 m ²
10,000	100	36	Quadrat Feldschuh			25 dm ²
$27,777\frac{2}{3}$	$277\frac{2}{3}$	100	$2\frac{2}{3}$	Quadrat Werkfuß		9 dm ²

80.26.4 Units of Volume

Metric-linked system after 1853

								Metric
Kubik Werkruthe								27 m ³
5	Wagen^a							5.4 m ³
$6\frac{7}{18}$	$1\frac{1}{18}$	Klafter^b						3.888 m ³
$33\frac{1}{3}$	$6\frac{2}{3}$	$4\frac{4}{5}$	Zain^c					810 dm ³
50	10	$7\frac{1}{5}$	$1\frac{1}{2}$	Bütte or Zain^d				540 dm ³
500	100	72	15	10	Erzmaass			54 dm ³
1000	200	144	30	20	2	Kubik Werkfuß		27 dm ³

^aFor charcoal

^bFor timber, 4 × 4 × 9 Fuß

^cFor brown coal

^dFor charcoal

80.26.5 Units of Dry Capacity

Traditional system used before 1818 and at Wiesbaden before 1872

				Metric	Metric
Malter				109.60 L	109.387 L
4	Virnsel			27.4 L	27.347 L
16	4	Kümpfe		6.85 L	6.837 L
64	16	4	Gescheid	1.712 L	1.709 L

Rounded scale used after 1818

					Metric
Malter					128 L
4	Simmer				32 L
16	4	Kumpf			8 L
64	16	4	Gescheid		2 L
256	64	16	4	Mässchen	500 mL

Metric-linked system after 1872

					Metric
Malter					100 L
10	Zehntel				10 L
100	10	Liter			1 L
200	20	2	Mässchen		500 mL
1000	100	10	5	Deciliter	100 mL

Other measures reported during the nineteenth century:

1 Achtel (at Weilbourg) = 110.83 L.

80.26.6 Units of Liquid Capacity

Traditional system used before 1818

				Metric
Ohm				135.56 L
20	Viertel			6.778 L
80	4	Maaß		1.694 5 L
320	16	4	Schoppen	423.625 mL

Metric-linked system used after 1818

					Metric
Stück ^a					1200 L
7½	Ohm				160 L
600	80	Maaß			2 L
1200	160	2	Flasche		1 L
2400	320	4	2	Schoppen	500 mL

^aUsually for wine

80.26.7 Units of Weight

After 1802

				Metric
leichter Pfund^a				470.686 g
32	Loth			14.709 g
128	4	Quenche		3.677 g
512	16	4	Richtpfennig	919.308 mg

^a1 **schwerer Pfund** (at Wiesbaden) = 498.927 g

After 1853

						Metric
Centner						50 kg
100	Pfund					500 g
3200	32	Loth				15.625 g
12,800	128	4	Quenzen			3.906 g
51,200	512	16	4	Richtpfennig		976.6 mg
102,400	1024	32	8	2	Heller	488.3 mg

For gold and silver

							Metric
Mark							233.957 000 g
8	Unze						29.245 625 g
16	2	Loth					14.622 312 g
64	8	4	Quentchen				3.655 578 g
256	32	16	4	Pfennig			913.894 mg
288	36	18	4½	1⅛	Gran		812.351 mg
512	64	32	8	2	1⅞	Heller	456.947 mg

Money exchanger's weights

			Metric
Vereinsmark			233.855 g
16	Loth		14.616 g
288	18	Gran	811.996 mg

For medical use

					Metric
Pfund					357.853 8 g
12	Unz				29.821 15 g
96	8	Drachme			3.727 64 g
288	24	3	Skrupel		1.242 55 g
5760	480	60	20	Gran	621.3 mg

80.27 Nassau-Usingen

In 1629, the County of Nassau-Weilburg was divided into three lines: Nassau-Weilburg, Nassau-Idstein and Nassau-Saarbrücken. In 1659, the area was divided into three Counties: Nassau-Ottweiler, Nassau-Saarbrücken and Nassau-Usingen. Nassau-Usingen became a Principality in 1688. As some Nassau lines died out during the early eighteenth century (Nassau-Idstein in 1721, Nassau-Ottweiler in 1723 and Nassau-Saarbrücken in 1728), Nassau-Usingen became their successor. In 1806, it joined the County of Nassau-Weilburg, merging to become the Duchy of Nassau. The land is now part of Hessen.

80.27.1 Units of Dry Capacity

		Metric
Malter		216.48 L
8	Simmer	27.06 L

80.28 Nuremberg

Nuremberg was a free imperial city within the Holy Roman Empire between 1219 and 1806, when it was annexed by Bavaria.

80.28.1 Units of Quantity

1 Kluppet = 4.

80.28.2 Units of Length

Before 1811

				Metric
Rute				4.863 568 m
16	Fuß or Schuh			303.973 mm
192	12	Zoll		25.331 mm
2304	144	12	Linie	2.111 mm

Other reported measures:

- 1 Pflasterrute = 3.951 6 m;
- 1 Klafter = 1.701 m;
- 1 bayersche Elle = 833.015 mm;
- 1 nürnberger Elle = 656.450 mm;
- 1 Werkschuh = 278.5 mm;
- 1 Werkzoll = 23.2 mm.

80.28.3 Units of Area

For forest areas before 1811

				Metric
Morgen or Tagwerk				4730.858 7 m ²
1½	kleiner Morgen			4139.501 4 m ²
200	175	grosse Quadratruthe		23.635 429 4 m ²
51,200	44,800	256	Quadrat Schuh	9.239 9 dm ²

For gardens before 1811

					Metric
Garten-morgen					3548.144 0 m ²
150	Quadratruthe				23.654 3 m ²
–	–	Quadrat-pflasterrute			15.615 5 m ²
–	–	–	Quadrat-klafter		2.795 1 m ²
38,400	256	169	30¼	Quadrat Schuh	9.239 9 dm ²

80.28.4 Units of Dry Capacity

For grain

							Metric
Korn-Simmer							318.137 600 L
2	Korn-Malter						159.068 800 L
4	2	Viertel					79.534 400 L
8	4	2	Achtel				39.767 200 L
16	8	4	2	Korn-Metze			19.883 600 L
64	32	16	8	4	Diethaufe		4.970 900 L
128	64	32	16	8	2	Diethäuflein or Kornmaass	2.485 450 L

For oats

				Metric
Hafer-Simmer				588.352 000 L
4	Hafer-Malter			147.088 000 L
32	8	Hafer-Metze		18.386 000 L
256	64	8	Hafer-Maass	2.298 250 L

Other reported measures:

- 1 **Hirse-Simmer** (for millet) = 26 Korn-Metzen
= about 530 L;
- 1 **Salzmetze** (for salt) = 16.4 L.

80.28.5 Units of Liquid Capacity

For general use before 1811

							Metric
Stück							1172.684 800 L
$1\frac{1}{3}$	Fuder						879.513 600 L
8	6	Ohm					146.585 600 L
16	12	2	Eimer				73.292 800 L
512	384	64	32	Viertel			2.290 400 L
544	408	68	34	$1\frac{1}{16}$	Schenkviertel		2.155 670 L
1024	768	128	64	2		Visirmaaß	1.145 200 L

For beer before 1811

							Metric
Biereimer							92.761 200 L
81	Visirmaaß						1.145 200 L
–	$1\frac{1}{16}$	Schenkmaaß					1.077 835 L
–	2	$1\frac{15}{17}$	Seidel				572.600 mL
–	–	2	$1\frac{1}{16}$	Schenkseidel			538.918 mL
–	–	–	2	$1\frac{15}{17}$	Schoppen		286.300 mL
–	–	–	16	–	8	Achtel	143.150 mL

80.28.6 Units of Weight

Before 1811

				Metric
Centner				50.999 600 kg
100	Pfund			509.996 g
3200	32	Loth		15.937 g
12,800	128	4	Quentchen	3.984 g

For medical use

							Metric
Medicinal Pfund							357.853 800 g
1½	Mark						238.569 200 g
12	8	Unze					29.821 150 g
96	64	8	Drachme				3.727 644 g
288	192	24	3	Skrupel			1.242 548 g
5760	3840	480	60	20	Gran		62.127 mg
6165	4110	4 ^{110/8}	4 ^{110/64}	4 ^{110/192}	411/384	Ass	58.05 mg

For gold and silver

							Metric
Pfund							477.138 400 g
2	Mark						238.569 200 g
16	8	Unze					29.821 150 g
32	16	2	Loth				14.910 575 g
128	64	8	4	Quentchen			3.727 644 g
512	256	32	16	4	Pfennig		931.911 mg
1024	512	64	32	8	2	Heller	465.955 mg

80.29 Oldenburg

An independent city that became part of Lower Saxony in 1946.

80.29.1 Currency

1857–1875: 1 Thaler = 30 Groschen =
360 Schwaren
1846–1857: 1 Thaler = 48 Schillinge =
72 Grot = 360 Schwaren
–1846: 1 Pistole = 5 Thaler =
240 Schillinge = 360 Grot =
1800 Schwaren

80.29.2 Units of Length

Two reported scales used before 1872

							Metric	Metric
Polizeimeile							8876.370 000 m	–
1500	alte Rute						5.917 580 m	5.938 319 m
1666 $\frac{2}{3}$	1 $\frac{1}{2}$	neue Rute					5.325 822 m	5.335 487 m
3000	2	1 $\frac{1}{2}$	Katasterrute				2.958 790 m	–
30,000	20	18	10	Fuß			295.879 mm	296.416 mm
360,000	240	216	120	12	Zoll		24.656 6 mm	24.701 mm
4,320,000	2880	2592	1440	144	12	Linie	2.054 7 mm	2.058 4 mm

For wires before 1872

				Metric
Stück				1452.200 000 m
10	Bind			145.220 000 m
1000	100	Umschlag or Faden		1.452 220 m
2500	250	2 $\frac{1}{2}$	Elle	580.880 mm

Other reported measures:

- 1 **Meile** = 33,357 Fuß = 9869.64 m;
- 1 **Geografische Meile** = 7419.860 m, but also reported as 25,079 Fuß = 7420.359 m;
- 1 **Elle** = 580.880 mm;
- 1 **rheinländische Fuß** = 313.853 5 mm;
- 1 **osnabrücker Fuß** = 279.29 mm.

80.29.3 Units of Area

Traditional system

		Metric
Bau		224,113.619 6 m ²
40	altes Jüch or Tagewerk	5602.840 5 m ²

Scale reported by [KAHN]

			Metric
Morgen			12,466.404 m ²
6	Hund		2077.734 m ²
356	59 $\frac{1}{3}$	Quadratrute	35.018 m ²

Before 1872

			Metric
Morgen			12,256.214 m ²
350	Quadrat-Rute		35.017 753 m ²
140,000	400	Quadrat-Fuß	8.754 4 dm ²

After 1872

			Metric
Jück			4538.300 8 m ²
160	Quadrat-Rute		28.364 380 m ²
51,840	324	Oldenburger Quadrat-Fuss	8.754 438 dm ²

For fields with oats

			Metric
Wente			56,098 m ²
9	Scheffel Hafersaat		6233.160 m ²
1602	178	Quadratrute	35.017 753 m ²

At Altenoythe, Barkel, and Friesoythe

			Metric
Friesoyther Scheffelsaat			768.198 6 m ²
13 $\frac{1}{2}$	Kanne		56.903 6 m ²
8775	650	Oldenburger Quadrat-Fuss	8.754 438 dm ²

At Cloppenburg

			Metric
Kloppenburger Scheffelsaat			910.457 6 m ²
16	Kanne		56.903 6 m ²
10,400	650	Oldenburger Quadrat-Fuss	8.754 438 dm ²

At Damme or Dümmer

					Metric
Osnabrücker Scheffelsaat					1181.844 m ²
1¼	Dammer Scheffelsaat				945.475 2 m ²
20	16	Kanne			59.092 2 m ²
54	43⅓	2⅒	Calenberger Rute		21.886 m ²
13,500	10,800	675	250	Oldenburger Quadrat-Fuss	8.754 438 dm ²

At Delmenhorst

				Metric
Oldenburger Scheffelsaat				850.927 68 m ²
30		Quadrat-Rute		28.364 256 m ²
9720		324	Oldenburger Quadrat-Fuss	8.754 438 dm ²

At Esens

			Metric
Essener Scheffelsaat			1225.616 m ²
20	Kanne		61.280 8 m ²
14,000	700	Oldenburger Quadrat-Fuss	8.754 438 dm ²

At Lönigen

				Metric
Sagterlander Scheffelsaat				945.475 2 m ²
16	Ring			59.092 2 m ²
18	1⅞	Kanne		52.526 4 m ²
10,800	675	600	Oldenburger Quadrat-Fuss	8.754 438 dm ²

At Stedingen

				Metric
Stedinger Scheffelsaat				612.808 m ²
17½	Quadrat-Rute			35.017 6 m ²
7000	400		Oldenburger Quadrat-Fuss	8.754 438 dm ²

At Steinfeld

			Metric
Bechtaer Scheffelsaat			976.991 04 m ²
18	Kanne		54.277 28 m ²
11,160	620	Oldenburger Quadrat-Fuss	8.754 438 dm ²

At Wildeshausen

			Metric
Wildeshausener Scheffelsaat			994.499 84 m ²
16	Kanne		62.156 24 m ²
11,360	710	Oldenburger Quadrat-Fuss	8.754 438 dm ²

80.29.4 Units of Volume

For firewood

		Metric
Faden		2.020 398 m ³
78	Kubik Fuss	25.903 dm ³

80.29.5 Units of Dry Capacity

System based on [CHEL] and [MART3]

							Metric	Metric
Last							3283.588 8 L	3283.372 800 L
12	Malt						273.632 4 L	273.614 400 L
18	1½	Tonne					182.421 6 L	182.409 600 L
41½	3⅞	2⅞	Kalktonne				79.809 4 L	79.804 200 L
144	12	8	3½	Scheffel			22.802 7 L	22.801 200 L
2304	192	128	56	16	Kanne		1.425 2 L	1.425 075 L
9216	768	512	224	64	4	Ort	356.3 L	356.269 mL

80.29.6 Units of Liquid Capacity

For wine and spirits

							Metric
Oxhoft							213.517 2 L
1½	Ohm						142.344 8 L
6	4	Anker					35.586 2 L
156	104	26	Kanne				1.368 7 L
240	160	40	1⅞ ₁₃	Quartier			889.655 mL
624	416	104	4	2⅞ ₅	Ort		342.175 mL

For beer and milk

			Metric
Biertonne			159.608 4 L
4	Henkemann		39.902 1 L
112	28	Bierkanne	1.425 075 L

Other reported measures:

1 **Henkemann** (for beer in Delmenhorst) = 24 Kannen = 34.96 L.

80.29.7 Units of Weight

Traditional system

			Metric
Quardeel or Quarteel			101 kg
12	Stechkannen		8.42 kg
216	18	Oldenburg Pfund	467.6 g

Upper scale before 1846

					Metric
Schiffslast					1922.292 000 kg
13⅓	Pfund Schwer				144.171 900 kg
13 ²³ / ₂₉	1 ¹ / ₂₉	Schiffspfund			139.366 170 kg
40	3	2 ⁹ / ₁₀	Zentner		48.057 300 kg
200	15	14½	5	Stein Flachs	9.611 460 kg

Lower scale before 1846

							Metric
Stein Flachs							9.611 460 kg
2	Stein Federn or Liespfund						4.805 730 kg
20	10	Oldenburger Pfund					480.573 g
640	320	32	Loth				15.018 g
2560	1280	128	4	Quentchen			3.754 g
10,240	5120	512	16	4	Pfennig		939 mg
163,840	81,920	8192	256	64	16	As	59 mg

Between 1846 and 1858

						Metric
Schiffslast or Rockenlast						1870.844 kg
3⅓	Pferdlast					561.253 2 kg
40	12	Zentner				46.771 1 kg
4000	1200	100	Cologne Pfund			467.711 g
128,000	38,400	3200	32	Loth		14.616 g
512,000	153,600	12,800	128	4	Quentchen	3.654 g

Metric-linked mercantile system between 1858 and 1872

							Metric
Schiffslast							2000 kg
3⅓	Pferdelast						600 kg
40	12	Centner					50 kg
4000	1200	100	Pfund				500 g
40,000	12,000	1000	10	Neuloth			50 g
400,000	120,000	10,000	100	10	Quint		5 g
4,000,000	1,200,000	100,000	1000	100	10	Halbgramm	500 mg

80.30 Pomerania

In 1648, this area was divided between Sweden (mainly the area named Vorpommern) and Brandenburg (mainly the area named Hinterpommern). Sweden ceded parts of their pos-
sessed land to Brandenburg in 1679 and Prussia in 1721. In 1814, the remaining Swedish land was ceded to Denmark. Pomerania came under the Prussian crown in 1815, and would remain

part of Germany until 1947. Most of the area is now part of Poland.

80.30.1 Units of Length

For general use

		Metric
Ruthe		4.674 078 m
16	Fuss	292.130 mm

For weaving

		Metric
Laken		14.00 m
24	Elle	583.33 mm

At Stettin, present-day Szczecin in Poland

		Metric
Ruthe		4.561 106 m
16	Fuss	285.069 mm

By the law of May 16, 1816, the measurement system of Prussia was also used officially throughout the rest of Germany.

80.31.1 Currency

- 1857–1873: 1 Prussian Vereinsthaler = 30 Silbergroschen = 360 Pfennige
1821–1857: 1 Prussian Thaler or Reichthaler = 30 Silbergroschen = 360 Pfennige

80.30.2 Units of Area

						Rute ²	Metric
Hägerhufe ^a						18,000	39.324 6 ha
1⅓	Tripelhufe					13,500	29.493 4 ha
2	1½	Landhufe or Dorfhufe ^b				9000	19.662 3 ha
3	2¼	1½	Priester Hufe			6000	13.108 2 ha
4	3	2	1⅓	Wendische Hufe or Hakenhufe		4500	9.831 2 ha
60	45	30	20	15	Morgen	300	0.655 41 ha

^a[KAHN] also reported 1 Hägerhufe = 374,473.056 m²
^b[KAHN] also reported 1 Dorfhufe or Landhufe = 30 Morgen = 187,236.526 m²

80.30.3 Units of Volume

1 **Grenze** (for firewood, 14 × 7 × 7 Fuss) = 294 prussian Kubikfuss = 9089 m³.

- 1750–1821: In Brandenburg: 1 Prussian Thaler = 24 Groschen = 288 Pfennige
In Prussia proper: 1 Prussian Thaler = 3 Polish Gulden = 90 Groschen

80.31 Prussia

In 1466, Old Prussia was split into a western part, the Royal Prussia, and an eastern part, called the Duchy of Prussia since 1525. The Kingdom of Prussia was formed in 1701. After defeating Denmark in 1864 and Austria in 1866, Prussia acquired Schleswig-Holstein, Hannover, Hesse-Cassel, Nassau and Frankfurt am Main. Prussia became part of the German Empire in 1871, and became a free state in 1918. Officially, Prussia ceased to exist in 1947, when the victorious allied powers in World War II declared it dissolved.

- In Aachen: 1⅓ Reichsthaler = 1 effective Reichsthaler = 2 Reichsgulden = 2¹⁰/₁₃ Schlechthalers = 8 Shillings = 12 Guldens = 72 Marcs = 432 Busches = 1728 Hellers

80.31.2 Units of Count

1 **Zahlstück** (for yarn in Holstein) = 10 Bind = 20 Knipp = 1200 Faden.

80.31.3 Units of Length

Old Kulm scale (after 1233), Kulm scale (after 1577) and Oletzko scale (after 1721)

						Metric	Metric	Metric
Meile						7779.24 m	7902.72 m	7501.41 m
1800	Rute					4.321 8 m	4.390 4 m	4.167 45 m
4500	2½	Klafter				1.728 72 m	1.756 16 m	1.666 98 m
13,500	7½	3	Elle			576.24 mm	585.387 mm	555.66 mm
27,000	15	6	2	Fuß		288.12 mm	292.693 mm	277.83 mm
324,000	180	72	24	12	Zoll	24.01 mm	24.391 mm	23.152 5 mm

After 1755

								Metric
Meile								7532.484 m
2000	Rute							3.766 242 m
–	–	Lachter						2.092 36 m
–	–	–	Klafter					1.883 121 m
–	–	–	–	preussische Elle				666.938 7 mm
24,000	12	6⅔	6	2⅞	preussische Fuß			313.853 5 mm
288,000	144	80	72	25½	12	Lachterzoll^a		26.154 46 mm
3,456,000	1728	960	864	306	144	12	Linie	2.179 5 mm

^aThe Lachterzoll was also subdivided into 10 Primen = 100 Sekunden

Legal system after 1816

							Metric
Meile							7532.484 m
2000	Rute						3.766 242 m
20,000	10	Fuß or Zentelrute					376.624 2 mm
200,000	100	10	Zoll or Dezimalzoll				37.662 42 mm
2,000,000	1000	100	10	Dezimallinie			3.766 242 mm
20,000,000	10,000	1000	100	10	Secunde		0.376 624 2 mm

The graduation of the decimal length could prevail in practice, but never really did. Thus, the linear measure remained duodecimal until the introduction of the metric system. Only in State Surveying was the application of the law evidence of 1816

For general use (*Rheinischer*) after 1816

							Metric
Rute							3.765 54 m
2	Klafter						1.882 77 m
5 ¹¹ / ₁₇	–	Elle					666.813 5 mm
12	6	2⅞	Fuß				313.794 6 mm
144	72	25½	12	Zoll			26.149 55 mm
1728	864	306	144	12	Linie		2.179 13 mm
20,736	10,368	3672	1728	144	12	Skrupel	181.594 µm

For building construction and surveying (*Geometrischer*) after 1816

							Metric
Meile							7.532 km
2000	Rute						3.766 m
10,000	5	Schritt					753.24 mm
20,000	10	2	Fuß				376.62 mm
200,000	100	20	10	Zoll			37.662 mm
2,000,000	1000	200	100	10	Linie		3.766 2 mm
20,000,000	10,000	2000	1000	100	10	Skrupel	376.62 µm

Artillery yardstick system

				Metric
Fuß				313.749 6 mm
12	Zoll			26.145 8 mm
120	10	Linie		2.614 58 mm
1200	100	10	Skrupel	261.458 µm

For surveying

				Metric
Fuß				314 mm
10	Zoll			31.4 mm
100	10	Linie		3.14 mm
1000	100	10	Skrupel	314 µm

Baufuss-system in Aachen

				Metric
Ruthe				4.619 2 m
16	Baufuß			288.7 mm
192	12	Zoll		24.058 mm
2304	144	12	Linie	2.004 9 mm

Landschuh-system in Aachen

				Metric
Ruthe				4.513 6 m
16	Klafter			1.692 6 m
96	6	Landschuh		282.1 mm

For surveying in Aachen

				Metric
Ruthe				4.511 658 m
16	Fuss			281.979 mm
192	12	Zoll		23.498 25 mm
2304	144	12	Linie	1.958 19 mm

In Berlin

		Metric
Ruthe		3.766 242 m
12	Schuh	313.853 5 mm

At Creveld

		Metric
Rute		4.601 600 m
16	Fuß	287.600 mm

Old and new scale at Erfurt

			Metric	Metric
Feldtruthe			3.963 492 m	3.965 640 m
14	Fuß		283.106 mm	283.260 mm
168	12	Zoll	23.592 mm	23.605 mm

There was also 1 **Elle** = 563.06 mm.

For surveying in Hannover

		Metric
Rute		4.673 5 m
10	Kettenfuß	467.35 mm

For general use in Hannover

		Metric
Rute		4.671 912 m
16	Fuß	291.994 5 mm

For yarn in Hannover

					Metric
Bund					7393.65 m
20	Stück or Loop				369.68 m
200	10	Gebind			36.968 m
3375	168 $\frac{3}{4}$	16 $\frac{7}{8}$	Faden		2.190 7 m
18,000	900	90	5 $\frac{1}{3}$	Elle	410.76 mm

At Hildesheim

				Metric
Rute				4.482 784 m
8	Elle			560.348 mm
16	2	Fuß		280.174 mm

For silk at Krefeld, based on [MART3]

			Metric
Strehn			476.000 m
400	Faden		1.190 m

At Königsberg in Preußen, present-day Kaliningrad (a part of Russia)

			Metric
Rute			4.615 426 m
15	Fuß		307.695 mm

At Königsberg in Preußen, present-day Kaliningrad (a part of Russia), based on [MART3]

			Metric
Ruthe			3.716 712 m
12	Fuß		309.726 mm

In Nordhausen before 1816

		Metric
Rute		6.240 46 m
10	Feldfuß	624.046 mm

In Nordhausen before 1816

			Metric
Werkfuß			292.7 mm
12	Zoll		24.392 mm
144	12	Linie	2.033 mm

Other reported measures:

- 1 **brabanter Elle** (at Krefeld) = 690.280 mm;
- 1 **brabanter Elle** (in Aachen) = 680.2 mm;
- 1 **Elle** (in Aachen) = 667.22 mm;
- 1 **Elle** (at Poznan, now part of Poland) = 594.120 mm;
- 1 **Elle** (at Königsberg, present-day Kaliningrad, a part of Russia) = 574.785 mm;
- 1 **Baufuss** (in Aachen) = 288.69 mm.

For wires at Königsberg in Preußen, present-day Kaliningrad (a part of Russia), based on [MART3]

						Metric
Spule						3734.847 200 m
2	Stück					1867.423 600 m
4	2	Toll				933.711 800 m
40	20	10	Gebinde			93.371 180 m
1600	800	400	40	Faden		2.334 279 m
5600	2800	1400	140	3 $\frac{1}{2}$	Elle	666.937 mm

80.31.4 Units of Area

Before 1872

				Metric
Hufe				7.658 688 ha
30	Morgen			2552.896 m ²
5400	180	Quadratrute		14.182 756 m ²
777,600	25,920	144	Quadratfuß	9.849 m ²

In Aachen

		Metric
Morgen ^a		3055.73 m ²
150	Quadratlandrute	20.371 m ²

^aAlso reported, by [MART3], as 8455.940 m²

In Berlin before 1816

			Metric
Morgen			5525.579 2 m ²
400	Quadrat Ruthe		13.813 948 m ²
57,600	144	Quadrat Fuss	9.593 02 m ²

In Berlin after 1816

				Metric
Hufe				76,596.725 5 m ²
30	Morgen			2553.224 2 m ²
5400	180	Quadrat Ruthe		14.184 579 m ²
777,600	25,920	144	Quadrat Fuss	9.850 4 dm ²

In Eiderstedt

			Metric
Demat			4541.1 m ²
216	Quadratrute		21.024 m ²
55,296	256	Hamburger Quadratfuß	8.212 m ²

In Erfurt

			Metric
Acker or Morgen			2642.018 5 m ²
168	Quadrat Feldrute		15.726 3 m ²
32,928	196	Quadrat Fuss	8.023 6 dm ²

In Fehmarn

				Metric
Drömtsaaat				9081.603 4 m ²
12	Shipsaat			756.800 3 m ²
48	4	Faßsaat		189.200 7 m ²
432	36	9	Quadratrute	21.022 2 m ²

Other reported measures:

- 1 **Morgen** (in Kehdingen) = 10,477 m²;
- 1 **Diemt, Demat, or Diemat** (in Hannover) = about 5673.83 m²;
- 1 **Acker** (in Nordhausen) = 160 Quadratruten = 2771.6 m²;
- 1 **Morgen** (in Hildesheim) = 2409.458 m²;
- 1 **Himtsaat** or **Scheffelsaat** (in Hannover) = ~ 873 m²;
- 1 **Ammersaat** (in Sylt) = 492.64 m², according to [BOOY].

For mortar and charcoal in Hohenzollern

		Metric
Kasten		7.348 m ³
24	Kübel	306.2 dm ³

For turf after 1816

			Metric
Haufe			10.017 m ³
3	Kubikklafter		3.339 m ³
324	108	Kubikfuß	3.09 dm ³

80.31.5 Units of Volume

Before 1816

			Metric
Kubikfuß			31.599 2 L
27	Stof		1.170 341 L
1728	64	Kubikzoll	18.286 6 mL

For coal after 1816

			Metric
Haufe			2418.306 L
11	Tonne		219.846 L
44	4	Scheffel	54.961 L

Upper scale for firewood after 1816

					Metric
Kubikrute					53.421 m ³
3%	Haufe ^a (= 18 × 9 × 3 Fuß)				15.024 7 m ³
8	2¼	Achtel			6.677 64 m ³
12	3⅞	1½	Schachtrute		4.451 76 m ³
16	4½	2	1⅓	Kubikklafter (= 6 × 6 × 3 Fuß)	3.338 82 m ³

^a[KAHN] also reported 1 **Haufe** = 4 Kubikklafter = about 13.356 m³

Lower scale for firewood after 1816

					Metric
Kubikklafter					3.338 82 m ³
4½	Kummen				0.741 96 m ³
108	24	Kubikfuß			30.915 L
2916	648	27	Stof		1.145 L
186,624	41,472	1728	64	Kubikzoll	17.891 mL

In Berlin before 1816

							Metric
Kubik Ruthe							53.422 848 m ³
–	Haufen						15.025 176 m ³
8	–	Achtel					6.677 856 m ³
12	–	1½	Schachtruthe				4.451 904 m ³
16	4½	2	1⅓	Klafter^a			3.338 928 m ³
72	20¼	9	6	4½	Kummen^b		741.984 dm ³
1728	486	216	144	108	24	Kubik Fuss	30.916 dm ³

^aFor firewood and stones

^bFor stones

For hay and straw in Berlin

		Metric
Schock		1.32 m ³
60	Bund	22 dm ³

80.31.6 Units of Dry Capacity

Before 1816, see also [KRÖG]

								Metric
Last								3370.600 L
2½	Wispel							1348.240 L
5	2	Malter						674.120 L
15	6	3	Tonne					224.707 L
60	24	12	4	Scheffel				56.177 L
240	96	48	16	4	Viertel			14.044 L
960	384	192	64	16	4	Metze		3.511 L
2880	1152	576	192	48	12	3	Stof or Pint	1.170 L

After 1816 (defined by the law of May 16, 1816)

								Kubik Zoll	Metric
Last								184,320	3297.720 L
2½	Wispel							73,728	1319.088 L
5	2	Malter						36,864	659.544 L
15	6	3	Tonne					12,288	219.844 L
60	24	12	4	Scheffel				3072	54.961 L
240	96	48	16	4	Viertel			768	13.740 L
960	384	192	64	16	4	Metze		192	3.435 L
2880	1152	576	192	48	12	3	Stof	64	1.145 L

Fass-scale for cereals in general and for rye in Aachen

					Metric	Metric
Malter^a and Kornmalter (for rye)					148.268 3 L	143.664 L
6		Faß^b			24.711 4 L	23.944 L
24		4	Kopf		6.177 8 L	5.986 L
96		16	4	Ründsel	1.544 6 L	1.496 L

^aAlso reported, by [MART3], as 148.248 L

^b1 **Faß** (for wheat) = 4 **Kopf**, and 1 **Faß** (for oats) = 6 **Kopf**

Mass-scale in Aachen

				Metric
Müdt				234.945 6 L
6	Maß			38.157 6 L
36	6	Kopf		6.526 3 L
144	24	4	Viertel	1.631 6 L

In Berlin before 1816

					Metric
Wispel					1313.520 L
2	Malter				656.760 L
24	12	Scheffel			54.730 L
96	48	4	Viertel		13.682 5 L
384	192	16	4	Metze	3.420 625 L

^aFor flaxseed

In Berlin after 1816

							Metric
Last							3297.690 L
2½	Wispel						1319.076 L
5	2	Malter					659.538 L
15	6	3	Tonne				219.846 L
60	24	12	4	Scheffel			54.961 5 L
240	96	48	16	4	Viertel		13.740 375 L
960	384	192	64	16	4	Metze	3.435 094 L

In Brandenburg

		Metric
Himt		25.92 L
4	Spint	6.48 L

In Erfurt until 1802

						Metric
Malter						715.358 400 L
4	Viertel					178.840 600 L
12	3	Scheffel				59.613 200 L
48	12	4	Metze			14.903 300 L
192	48	16	4	Viertelmaß		3.725 825 L
768	192	64	16	4	Kanne	931.456 mL

In Hannover

			Metric
Krug			1.385 L
4	Ort		346.25 mL
16	4	Viertelort	86.562 mL

In Lauenburg

			Metric
Drömt			561.0 L
12	Scheffel		46.75 L
18	1½	Himten	31.17 L

In Nordhausen before 1816

						Metric
Marktscheffel						547.584 L
12	Scheffel					45.632 L
48	4	Viertel				11.408 L
76 $\frac{1}{5}$	6 $\frac{1}{5}$	1 $\frac{3}{5}$	Heymetzen			7.130 L
144	12	3	1 $\frac{1}{8}$	Mäßchen		3.803 L
192	16	4	2 $\frac{1}{2}$	1 $\frac{1}{3}$	Metze	2.852 L

At Rendsburg

		Metric
Scheffel		42.52 L
2	Spint	21.26 L

Other reported measures:

1 **Wispel** (for oats) = 26 Scheffel = 1429.012 L;1 **Wispel** (for barley and oilseeds) = 25 Scheffel
= 1374.05 L;1 **Wispel** (for wheat and rye) = 24 Scheffel =
1319.088 L;1 **Schaff** (for grain at Dittfurt) = 755.19 L;1 **Wispel** (for lime) = 7 Kubik-Fuß = 216.4 L;1 **Leinsaattonne** (for flaxseed in Berlin) =
37 $\frac{2}{3}$ Metzen = 128.843 L;1 **Himten** (in Hildesheim) = 25.926 15 L.**80.31.7 Units of Liquid Capacity**

For general use before 1816

								Metric
Fuder								898.825 728 L
4	Oxhoft							224.706 432 L
6	1 $\frac{1}{2}$	Ohm						149.804 288 L
12	3	2	Eimer					74.902 144 L
24	6	4	2	Anker				37.451 072 L
768	192	128	64	32	Stof			1.170 346 L
960	240	160	80	40	1 $\frac{1}{4}$	Flasche		936.276 8 mL
1536	384	256	128	64	2	1 $\frac{1}{2}$	Oeßel	585.173 mL

For general use (through particularly used for wine and spirits) after 1816

									Metric	
Fuder										
1⅓	Hufe								824.422 560 L	
4	2⅔	Oxhoft							458.012 533 L	
6	3⅓	1½	Ohm						206.105 640 L	
7⅕	4	1⅕	1⅓	Tonne					137.403 760 L	
12	6⅔	3	2	1⅓	Eimer				114.503 133 L	
24	13⅓	6	4	3⅓	2	Anker			68.701 880 L	
720	400	180	120	100	60	30	Quart or Stof		34.350 940 L	
960	533⅓	240	160	133⅓	80	40	1⅓	Flasche	1.145 031 L	
1440	800	360	240	200	120	60	2	1½	Oeßel	858.773 5 mL
									572.515 7 mL	

For beer before 1816

							Metric
Gebäude							4044.6 L
9	Kufe						449.4 L
18	2	Faß					224.7 L
36	4	2	Tonne				112.35 L
144	16	8	4	Öhmchen			28.087 5 L
3456	384	192	96	24	Stof		1.170 3 L
6912	768	384	192	48	2	Öbel	585.156 mL

For beer after 1816 (and generally used rounded figures)

							Metric	Metric
Gebäude							4122.112 800 L	4122 L
9	Kufe						458.012 533 L	458 L
18	2	Faß					229.006 267 L	229 L
36	4	2	Biertonne				114.503 133 L	114.5 L
3600	400	200	100	Quart or Stof			1.145 031 3 L	1.145 L

For beer in Aachen

		Metric
Bier-Tonne		1.133 1 L
104	Bier-Kanne	10.895 mL

For wine in Aachen

				Metric
Ahm				138.58 L
130	Wein-Kanne			1.066 L
520	4	Pinte		266.5 mL
2080	16	4	Mässchen	66.625 mL

For general use in Aachen

		Metric
Ahm		136.604 L
128 $\frac{2}{3}$	Kanne	1.066 L

For beer and milk at Erfurt

							Metric
Eimer							73.65 L
18	Stübchen						4.092 L
36	2		Kanne				2.046 L
72	4	2		Maß			1.023 L
144	8	4	2		Nösel		511.46 mL

For wine at Erfurt

							Metric
Fuder							851.16 L
12	Eimer						70.93 L
252	21	Stübchen					3.378 L
504	42	2	Kanne				1.689 L
1008	84	4	2	Maß			844.46 mL
2016	168	8	4	2	Nösel		422.23 mL

In Hildesheim

		Metric
Centner		51.367 800 kg
110	Pfund	466.980 g

At Königsberg (present Kaliningrad, a part of Russia)

				Metric
Both				421.2 L
2	Oxhoft			210.6 L
3	1½	Ohm		140.4 L
12	6	4	Anker	35.1 L

At Königsberg in Preußen, present-day Kaliningrad (a part of Russia), based on [MART3]

							Metric
Both							515.374 164 L
1⅓	Pipe						386.530 623 L
2	1½	Oxhoft					257.687 082 L
3	2¼	1½	Ohm				171.791 388 L
12	18	6	4	Anker			42.947 847 L
60	90	30	20	5	Viertel		8.589 569 L
360	270	180	120	30	6	Stof	1.431 595 L

In Nordhausen before 1816

						Metric
Faß						997.08 L
4	Tonne					249.27 L
114	28½	Stübchen				8.746 L
228	57	2	Kanne			4.373 L
456	114	4	2	Maß		2.186 6 L
912	228	8	4	2	Nösel	1.093 3 L

Other reported measures:

1 **Weinmaas** or **Pot** (for wine in Geldern) =
1.317 L.

80.31.8 Units of Weight

Scale used in Cologne after 1524

									Metric
Mark									233.855 g
8	Uns								29.232 g
16	2	Loth							14.616 g
64	8	4	Qvertchen						3.654 g
256	32	16	4	Pfennig					913.50 mg
512	64	32	8	2	Heller				456.75 mg
4020	–	–	–	–	–	Ass			58.17 mg
4352	–	–	–	–	–	–	Echer		53.74 mg
65,536	–	–	–	–	–	–	–	Richtpfennig	3.57 mg

Between 1816 and 1858

								Metric
Schiffslast								1870.844 kg
13 $\frac{1}{3}$	Schiffspfund							140.313 3 kg
40	3	Zentner^a						46.771 10 kg
181 $\frac{1}{11}$	13 $\frac{1}{11}$	4 $\frac{9}{11}$	Stein^b					10.289 642 kg
4000	300	100	22	Pfund^c				467.711 g
8000	600	200	44	2	Mark			233.855 5 g
128,000	9600	3200	704	32	16	Loth		14.616 g
512,000	38,400	12,800	2816	128	64	4	Quentchen	3.654 g
2,048,000	153,600	51,200	11,264	512	256	16	4	Pfennig 913.5 mg

^aAlso reported by [CHEL] as 110 Pfund = 51.448 21 kg^bUsed for wool^cDefined as a 66th part of the weight of a cubic foot of distilled water in a vacuum at 15° Réaumur

For transportation by ship before 1840

			Metric
Schiffslast			1574.3 kg
12	Schiffspfund		131.190 kg
240	20	Liespfund	6.559 5 kg

Upper scale before 1840 (*Berliner kölnische Pfund system*)

				Metric
Zentner				51.539 kg
5	Schwerer Stein			10.307 8 kg
10	2	Leichter Stein		5.153 9 kg
110	22	11	Pfund	468.536 g

Lower scale before 1840 (*Berliner kölnische Pfund system*)

							Metric
Pfund							468.536 g
2	Mark						234.268 g
16	8	Unze					29.283 5 g
32	16	2	Lot				14.641 75 g
128	64	8	4	Quentchen			3.660 44 g
512	256	32	16	4	Pfennig		915.109 mg
1024	512	64	32	8	2	Heller	457.555 mg

Upper scale after 1840 (*Zollpfund system*)

					Metric
Schiffslast					2000 kg
2	Tonne				1000 kg
13 $\frac{1}{3}$	6 $\frac{2}{3}$	Schiffspfund			150 kg
40	20	3	Centner		50 kg
4000	2000	300	100	Pfund	500 g

Lower scale after 1840 (*Zollpfund* system)

					Metric
Pfund					500 g
30	Lot				16.667 g
300	10	Quentchen			1.667 g
3000	100	10	Zent		166.7 mg
30,000	1000	100	10	Korn	16.7 mg

In Aachen

									Metric
Schiffpfund									148.519 5 L
2 ⁴ / ₅₃	Centner^a								52.830 2 kg
3	1 ⁷ / ₅₀	Centner							49.839 83 kg
318	106	100	Pfund						498.398 3 g
636	212	200	2	Mark					249.199 2 g
5088	1696	1600	16	8	Unze				31.149 9 g
10,176	3392	3200	32	16	2	Loth			15.574 9 g
40,704	13,568	12,800	128	64	8	4	Quentchen		3.893 7 g
161,616	54,272	51,200	512	256	32	16	4	Pfennig	973.4 mg

^aFor agricultural imports

At Königsberg in Preußen, present-day Kaliningrad (a part of Russia), based on [MART3]

					Metric
Schiffspfund					154.643 280 kg
20	Liespfund				7.732 164 kg
330	16 ¹ / ₂	Pfund			468.616 g
10,560	528	32	Loth		14.644 g
42,240	2112	128	4	Quentchen	3.661 g

For silk at Krefeld, based on [MART3]

		Metric
Denier		53.363 g
24	Grän	2.223 g

Other reported measures:

- 1 **Schwere Pfund** (at Poznan, now part of Poland) = 417.810 g;
- 1 **Leichte Pfund** (at Poznan, now part of Poland) = 398.350 g;
- 1 **Denier** (for silk in Krefeld) = 53 mg.

For medical use in Berlin before 1816, based on [MART3]

					Metric
Pfund					357.567 g
12	Unze				29.797 25 g
96	8	Drachme			3.724 656 g
288	24	3	Scrupel		1.241 552 g
5760	480	60	20	Grän	62.078 mg

For medical use before 1816, after 1816 and between 1856 and 1867

					Metric	Metric	Metric
Pfund					357.670 g	350.783 250 g	375.000 000 g
12	Unze				29.805 833 g	29.231 938 g	31.250 000 g
96	8	Drachme			3.725 729 g	3.653 992 g	3.906 250 g
288	24	3	Scrupel		1.241 910 g	1.217 997 g	1.302 083 g
5760	480	60	20	Grän	62.095 mg	60.900 mg	65.104 mg

For gold and silver after 1816

							Metric
Mark							233.855 500 g
8	Unze						29.231 938 g
16	2	Loth					14.615 969 g
64	8	4	Quentchen				3.653 992 g
256	32	16	4	Pfennig			913.498 mg
512	64	32	8	2	Heller		456.749 mg
65,536	8192	4096	1024	256	128	Richtpfennig	3.568 mg

80.32 Reuss

Reuss was the name of some historical states located in present-day Thuringia. The Reuss territories were unified in 1919 as the Republic of Reuss, which was incorporated into Thuringia in 1920.

80.32.1 Currency

1841–1857: 1 Thaler = 30 Silbergroschen =
360 Pfennige
–1840: 1 Thaler = 24 guten Groschen =
288 Pfennige

80.32.2 Units of Length

At Ebersdorf, Gera, Greiz, Schleiz, Hohenleuben
and Zeulenroda

					Metric	Metric	Metric	Metric	Metric
Ruthe					4.863 6 m	4.579 152 m	4.520 m	4.547 2 m	4.640 m
8	Elle				607.950 mm	572.394 mm	565.0 mm	568.4 mm	580.0 mm
16	2	Fuß			303.975 mm	286.197 mm	282.5 mm	284.2 mm	290.0 mm
192	24	12	Zoll		25.331 mm	23.850 mm	23.542 mm	23.683 mm	24.167 mm
2304	288	144	12	Linie	2.110 9 mm	1.987 mm	1.961 8 mm	1.973 6 mm	2.013 9 mm

At Greiz, based on [MART3]

					Metric
Ruthe					4.531 040 m
8	Elle				588.500 mm
16	2	Fuß			283.190 mm
192	24	12	Zoll		23.599 mm
2304	288	144	12	Linie	1.967 mm

At Schleiz

					Metric
Vermessungsruthe					3.766 242 m
12	Vermessungsfuß				313.853 5 mm
144	12	Zoll			26.154 5 mm
1728	144	12	Linie		2.179 5 mm

80.32.3 Units of Area

At Ebersdorf

			Metric
Acker or Scheffel			3784.7 m ²
160	Quadrat Ruthe		23.654 4 m ²

At Gera

			Metric
Scheffel			2516.236 m ²
120	Quadrat Ruthe		20.968 633 m ²
30,720	256	Quadrat Fuß	8.190 9 dm ²

At Greiz

			Metric
Scheffel or Morgen			3284.851 8 m ²
160	Quadrat Ruthe		20.530 323 m ²
40,960	256	Quadrat Fuß	8.196 6 dm ²

At Hohenleuben and Schleiz

			Metric
Morgen			2269.531 6 m ²
160	Quadrat Ruthe		14.184 579 m ²
23,040	144	Quadrat Fuß	9.850 4 dm ²

At Zeulenroda

			Metric
Scheffel Saat ^a			2521.4 m ²
120	Quadrat Ruthe		21.011 7 m ²

^aAlso reported as 160 Quadratruthen = 3268.86 m²

Other reported measures:

- 1 **Acker** (at Lobenstein) = 3784.7 m²;
- 1 **Morgen** (at Gera) = 2553.223 1 m².

80.32.4 Units of Volume

- 1 **Klafter** (for firewood) = (3 × 3 × 1½ or 1¾ Ellen).

80.32.5 Units of Dry Capacity

At Gera

						Metric
Wispel						2547.685 786 L
2	Malter					1273.842 893 L
24	12	Scheffel				106.153 574 L
96	48	4	Viertel			26.538 394 L
384	192	16	4	Maß		6.634 598 L
2880	1440	120	30	7½	Kanne	884.613 mL

At Greiz, Schleiz, Hohenleuben and Zeulenroda

				Metric	Metric	Metric
Scheffel				156.912 L	192.365 000 L	129.33 L
4	Viertel			39.228 L	48.091 250 L	32.332 L
16	4	Napf or Maß		9.807 L	12.022 800 L	8.083 L
120	30	7½	Kanne	1.307 6 L	1.603 040 L	1.077 75 L

80.32.6 Units of Liquid Capacity

At Gera and Lobenstein

						Metric
Fass ^a						398.075 904 L
2	Oxhoft ^a					199.037 952 L
4	2	Tonne ^a				99.518 976 L
6	3	1½	Eimer			66.345 984 L
432	216	108	72	Kanne		921.472 mL
864	432	216	144	2	Nöbel	460.736 mL

^aFor beer

At Greiz

		Metric
Eimer		67.267 456 L
48	Kanne	1.401 404 L

At Hohenleuben and Zeulenroda

		Metric
Eimer ^a		64.714 L
80	Kanne ^a	808.93 mL

^a[DÖRI3, p. 213] reported: 1 **Kanne** = about 898.80 mL, and 1 **Eimer** = 72 Kannen

At Schleiz

		Metric
Eimer		61.831 607 L
72	Kanne	858.772 mL

80.32.7 Units of Weight

Many of the weights used in Prussia were also in common use.

At Gera, Greiz, Hohenleuben, Lobenstein, Schleiz and Zeulenroda before 1858

									Metric
Schiffpfund									151.180 620 kg
3	Centner								51.393 540 kg
7½	2½	Waage Eisen							20.557 416 kg
10⅝	3⅔ ₄₈	1⅞	Stein						10.278 708 kg
330	110	44	32	Pfund ^a					467.214 g
10,560	3520	1408	1024	32	Loth				14.600 g
42,240	14,080	5632	4096	128	4	Quentchen			3.650 g
168,960	56,320	22,528	16,384	512	16	4	Pfenniggewicht		913 mg
337,920	112,640	45,056	32,768	1024	32	8	2	Hellergewicht	46 mg

^aAlso reported as 467.624 6 g

For gold and silver at Gera

								Metric
Mark								233.607 000 g
8	Unze							29.200 875 g
16	2	Loth						14.600 437 g
64	8	4	Quentchen					3.650 109 g
256	32	16	4	Pfennig				912.527 mg
512	64	32	8	2	Heller			456.264 mg
65,536	8192	4096	1024	256	128	Richtpfennig		3.565 mg

For medical use at Gera

								Metric
Pfund								357.858 800 g
1½	Mark							238.572 533 g
12	8	Unze						29.821 567 g
96	64	8	Drachme					3.727 696 g
288	192	24	3	Skrupel				1.242 565 g
5760	3840	480	60	20	Gran			62.128 mg
6165	4110	4 ^{110/8}	4 ^{110/64}	4 ^{110/192}	411/384	Ass		58.05 mg

Some other reported measures:

100 L (for wheat) = about 80 kg;

100 L (for rye) = about 75 kg;

100 L (for barley) = about 70 kg;

100 L (for oats) = about 50 kg;

1 **Mark** (as money weight at Gera) = 233.855 500 g;

1 **Dukaten-As** (at Gera) = 52.828 mg.

80.33 Rhineland

The Rhine Province was created in 1824 by joining the provinces of Lower Rhine and Jülich-

Cleves-Berg. In 1920, the Saar was separated from the Rhine Province. In 1946, it was divided up between the states of North Rhine-Westphalia, Rhineland-Palatinate and Hesse.

80.33.1 Currency

1824–: 1 Thaler = 30 Silbergroschen = 360 Pfennige

–1824: 1 Reichsthaler = 60 Stüber = 240 Föchs or Pfennige

80.33.2 Units of Length

In Cologne

					Metric
Ruthe					4.598 28 m
8	Elle				574.785 mm
16	2	Fuß			287.393 mm
192	24	12	Zoll		23.949 mm
2304	288	144	12	Linie	1.995 6 mm

For surveying at Nassau after 1818

		Metric
Ruthe		5 m
10	pieds d'arpentage	500 mm

Other reported measures:

1 **Brabanter Elle** = 694.380 mm;

1 **Aune** (in Koblenz) = 558.500 mm.

80.33.3 Units of Area

In Cologne

			Metric
Morgen			3171.637 880 m ²
150	Quadratruthe		21.144 252 m ²
38,400	256	Quadratfuss	8.259 474 dm ²

80.33.4 Units of Volume

1 **Zain** (for charcoal) = 10 preussische Scheffel
= 0.546 9 m³.

80.33.5 Units of Dry Capacity

In Cologne

						Metric
Last						2870.800 L
20	Malter					143.540 L
80	4	Sümmer				35.885 L
160	8	2	Faß			17.942 5 L
320	16	4	2	Viertel		8.971 25 L
1280	64	16	8	4	Fäßchen	2.242 812 5 L

In Soest

			Metric
Scheffel			29.44 L
4	Spint		7.36 L
16	4	Becher	1.84 L

Traditional system in Mainz before 1818

				Metric
Malter				109.388 L
4	Virnsel			27.347 L
16	4	Kümpfe		6.837 L
64	16	4	Gescheid	1.709 L

Other reported measures:

1 **Malter** (in Koblenz) = 159.632 L.

80.33.6 Units of Liquid Capacity

In Cologne

					Metric
Fuder					933.529 800 L
6	Ohm				155.588 300 L
1014	26	Viertel			5.984 165 L
4056	676	4	Maß		1.496 041 L
16,224	2704	16	4	Pinte	374.010 mL

In Mainz before 1818

				Metric
Ohm				135.574 L
20	Viertel			6.778 7 L
80	4	Maß		1.694 7 L
320	16	4	Schoppen	423.669 mL

Other reported measures:

1 **Logel** (in Rheinpfalz) = 40 L.

80.33.7 Units of Weight

In Cologne

									Metric
Centner									49.568 208 kg
106	Pfund								467.624 6 g
212	2	Mark							233.812 3 g
1696	16	8	Unze						29.226 5 g
3392	32	16	2	Loth					14.613 3 g
13,568	128	64	8	4	Quentchen				3.653 3 g
54,272	512	256	32	16	4	Pfennig			913.3 mg
108,544	1024	512	64	32	8	2	Heller		456.7 mg
13,893,632	131,072	65,536	8192	4096	1024	256	128	Richtpfennigtheil	3.6 mg

In Koblenz

		Metric
Libbra		466.343 g
32	Loth	14.573 g

For gold and silver in Cologne

							Metric
Kölnische Mark							233.855 500 g
8	Unze						29.231 937 g
16	2	Loth					14.615 969 g
64	8	4	Quentchen				3.653 992 g
256	32	16	4	Pfennig			913.498 mg
512	64	32	8	2	Heller		456.749 mg
4352	544	272	68	17	8½	Eschen	53.735 mg
65,536	8192	4096	1024	256	128	15⅓	Richtpfennig 3.568 mg

For fine use in Cologne

		Metric
Mark		233.855 500 g
67	Dukat	3.490 381 g
4020	60	Kölnische As 58.173 mg

80.34 Saxe-Altenburg

The Duchy of Saxe-Altenburg was created in 1603 as an Imperial State in its own right. In 1672, it became part of Saxe-Gotha-Altenburg, until the fall of that house in 1825. Gotha then became part of Saxe-Coburg-Saalfeld and Altenburg became part of Saxe-Hildburghausen. Saxe-Altenburg was incorporated into the new state of Thuringia in 1920.

80.34.1 Currency

1841–1857: 1 Saxon Thaler = 30 Neugroschen
= 300 Pfennig

80.34.2 Units of Length

Traditional system

						Metric	Metric
Meile						9081.426 m	9081.308 m
1600	Ruthe					5.675 89 m	5.675 880 m
2666⅔	1⅔	Klafter				3.405 534 m	3.405 528 m
16,000	10	6	Vermessungsfuß			567.589 mm	567.588 mm
32,000	20	12	2	Baufuß		283.794 5 mm	283.794 mm
160,000	100	60	10	5	Zoll	56.758 9 mm	56.758 8 mm
1,600,000	1000	600	100	50	10	Linie 5.675 89 mm	5.675 88 mm

For buildings

				Metric
Klafter				1.702 767 m
6	Baufuß			283.794 5 mm
72	12	Zoll		23.649 5 mm
864	144	12	Linie	1.970 8 mm

80.34.3 Units of Area

For land areas

			Metric
Hufe			77,317.476 4 m ²
12	Acker		6443.123 2 m ²
2400	200	Quadrat-Ruthe	32.215 616 m ²

Other reported measures:

1 **Fundgrube** (for mining, 28 × 28 Lachter) = 3136 m².

80.34.4 Units of Volume

Some reported measures:

1 **Klafter** (for firewood, 6 × 6 × 4 Fuß) = 144 Kubikfuß;

1 **Klafter** (for firewood, 6 × 6 × 3 Fuß) = 108 Kubikfuß.

80.34.5 Units of Dry Capacity

Traditional system

						Metric
Malter						293.943 60 L
2	Scheffel					146.971 80 L
2 ² / ₃	1 ¹ / ₃	Sack				110.228 85 L
8	4	3	Viertel			36.742 95 L
32	16	12	4	Metze		9.185 737 L
128	64	48	16	4	Maaß	2.296 434 L

80.34.6 Units of Liquid Capacity

			Metric	Metric
Eimer			68.466 L	67.362 336 L
60	Kanne		1.141 1 L	1.122 706 L
120	2	Nöbel	570.55 mL	561.353 mL

80.34.7 Units of Weight

Mercantile system

					Metric
Centner					51.438 7 kg
5	Stein				10.287 7 kg
110	22	Pfund			467.624 6 g
3520	704	32	Loth		14.613 3 g
14,080	2816	128	4	Quentchen	3.653 3 g

For coins, gold and silver

		Metric
Vereinsmark		233.855 g
288	Gran	812 mg

For medical use

					Metric
Pfund					357.853 8 g
12	Unz				29.821 15 g
96	8	Drachme			3.727 64 g
288	24	3	Skrupel		1.242 55 g
5760	480	60	20	Gran	621.3 mg

80.35 Saxe-Coburg-Gotha

Saxe-Coburg-Gotha served as the name of two duchies, Saxe-Coburg and Saxe-Gotha. The two duchies were in personal union between 1826 and 1918. The Free State of Saxe-Coburg-Gotha was merged into the state of Thuringia in 1920.

80.35.1 Currency

1837–1857: 1 Saxon Thaler = 30 Neugroschen
 = 300 Pfennigen

In Coburg:
1857–1859: 1 Gulden = 60 Kreuzern =
 240 Pfennige = 480 Heller
1753–1857: 1 Gulden = 60 Kreuzern =
 240 Pfennige

In Gotha:
1841–1872: 1 Thaler = 30 Groschen =
 300 Pfennige
1761–1840: 1 Thaler = 24 guten Groschen =
 288 Pfennige = 576 Heller

80.35.2 Units of Length

In Coburg and in Gotha before 1872

					Metric	Metric
Werkruthe					4.255 622 m	4.026 652 m
2⅓	Klafter				1.823 838 m	1.725 708 m
14	6	Baufuß, Werkfuß, or Vermessungsfuß^a			303.973 mm	287.618 mm
168	72	12	Zoll		25.331 mm	23.968 2 mm
2016	864	144	12	Linie	2.110 9 mm	1.997 3 mm

^aFor agriculture use: 1 **Vermessungsruthe** = 12 Vermessungsfuß = 3.766 242 m

In Coburg before 1872

		Metric
Vermessungsruthe		3.766 m
12	Vermessungsfuß	313.853 5 mm

In Gotha before 1872

					Metric
Chaussemeile					7421.119 636 m
	Stunde				4429.317 200 m
1638 $\frac{7}{8}$	962 $\frac{1}{2}$	Waldruthe			4.601 888 m
1843	1100	1 $\frac{1}{7}$	Feldruthe		4.026 652 m
25,802	15,400	16	14	Baufuß, Werkfuß, or Vermessungsfuß	287.618 mm

For yarn

				Metric
Zaspel^a				788.70 m
10	Gebinde			78.87 m
400	40	Faden		1.972 m
1400	140	3 $\frac{1}{2}$	Gothaer Elle	563.36 mm

^aFor long yarn windings = 1400 Gothaer Elle, but for short yarn windings = 1200 Gothaer Elle = 675.17 m

Other reported measures:

1 **Meile** or **Chaussee-Meile** (in Gotha) =
7421.10 m;

1 **Ackerrute** (in Camburg) = 10 sächsischer Fuß
= 2.831 9 m;

1 **Elle** (in Coburg) = 586.290 mm;

1 **Elle** (in Gotha) = 562.640 mm.

80.35.3 Units of Area

For fields in Coburg

			Metric
Feldmorgen			2897.651 m ²
160	Quadratwerkruthen		18.110 3 m ²
31,360	196	Quadratwerkfuss	9.239 96 dm ²

For forests in Coburg

			Metric
Waldmorgen			2553.223 1 m ²
180	Vermessungsquadratruthen		14.184 57 m ²
25,920	144	Vermessungsquadrafuss	9.850 40 dm ²

For fields in Gotha before 1872

			Metric
Feld-Acker			2269.981 3 m ²
140	Quadrat-Feldruthe		16.214 152 m ²
27,440	196	Quadratfuss	8.272 5 dm ²

For forests in Gotha before 1872

			Metric
Wald-Acker			3388.426 8 m ²
160	Quadrat-Waldruthe		21.177 668 m ²
40,960	256	Quadratfuss	8.272 5 dm ²

Other reported measures:

1 **Hufe** (also divided into $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{8}$) = 30 Acker
= 213,856 m²;

1 **Acker** (in Camburg) = 20,000 Quadratellen =
6415.726 m².

80.35.4 Units of Volume

In Coburg

				Metric
Kubik Werkruthe				77.070 670 m ³
14	Schachtruthe			5.505 048 m ³
–	–	Klafter^a		4.044 525 m ³
2744	196	144	Kubik Werkfuss	28.086 979 dm ³

^aWhen used for stones, reported as 1 **Stutz**

In Gotha

								Metric
Kubik Waldruthe								97.457 256 m ³
8	Werkruthe^a							12.182 157 m ³
16	2	Schachtruthe^b						6.091 079 m ³
40	5	2½	Klafter^c					2.438 899 m ³
–	–	–	1⅞	Dorfklafter^c				1.693 680 m ³
4096	512	256	108¾	75	Kubik Fuss			23.793 dm ³
–	–	–	180	–	–	Kubik Waldfuss		22.582 dm ³
11,808,000	1,276,000	738,000	295,200	129,600	1728	1640	Kubik Zoll	13.769 241 cm ³

^aFor pavements

^bFor earth and stones

^cFor firewood

Other reported measures:

- 1 **Klafter** (for firewoods in Coburg, $6 \times 6 \times 4$ Fuß) = 144 Kubikfuß;
 1 **Klafter** (for firewoods, $6 \times 6 \times 3$ Fuß) = 108 Kubikfuß;
 1 **Malter** (for firewood in Gotha) = 60 Kubikfuß = $1.427\,595\text{ m}^3$;
 1 **Stutz** or **Stotz** (for charcoal in Gotha) = 19,026 Kubik Zoll = $261.973\,592\text{ dm}^3$;
 1 **Bergscheffel** (for coal in Gotha) = 2920 Kubik Zoll = $40.206\,186\text{ dm}^3$.

80.35.5 Units of Dry Capacity

For grains ([DOUR]/[NELK]) and for lime ([DOUR]/[NELK]) in Coburg

			Metric	Metric
Simmer or Simra			87.76 L/88.55 L	109.79 L/110.45 L
4	Viertel		21.94 L/22.14 L	27.45 L/27.61 L
16	4	Metze	5.485 L/5.534 L	6.862 L/6.903 L

For rye, wheat and legumes ([WAGN2]/[MART3]) and for barley, oats and dinkel ([WAGN2]/[MART3]) in Coburg

			Metric	Metric
Simmer or Simra			88.946 L/90.416 6 L	110.449 L/113.020 750 L
4	Viertel		22.236 L/22.604 150 L	27.612 L/28.255 187 L
16	4	Metze	5.559 L/5.651 037 L	6.903 L/7.063 797 L

In Gotha

						Metric
Malter^a						174.649 061 3 L
2	Scheffel					87.324 531 L
4	2	Viertel				43.662 265 L
16	8	4	Metze			10.915 566 L
64	32	16	4	Mäßchen		2.728 892 L
384	192	96	24	6	Nösel	454.815 mL

^aEqual to 12,684 Kubik Zoll

80.35.6 Units of Liquid Capacity

Oil was sold by weight.

In Coburg

		Metric
Eimer		77.344 960 L
80	Maß^a	966.812 mL

^a1 **Landmaass** or **Milchmaass** (for milk in Coburg) = 1.021 040 L

For wine in Gotha

								Metric
Fuder								873.245 306 L
4	Oxhoft							218.311 327 L
6	1½	Ohm						145.540 884 L
8	2	1⅓	Feuillette					109.155 663 L
12	3	2	1½	Eimer^a				72.770 442 L
24	6	4	3	2	Anker			36.385 221 L
480	120	80	60	40	20	Kanne		1.819 261 L
960	240	160	120	80	40	2	Maß	909.631 mL
1920	480	320	240	160	80	4	2	Nösel 454.815 mL

^aIt was equal to 5285 Kubik Zoll

For beer in Gotha

					Metric
Bierlast					1047.894 368 L
12	Tonne				87.324 531 L
288	24	Stübche			3.638 522 L
576	48	2	Kanne		1.819 261 L
1728	144	6	3	Seidel	606.420 mL

For brandy in Gotha

		Metric
Fass		200.118 716 L
110	Kanne	1.819 261 L

Other reported measures:

- 1 **Faß** (for spirits in Gotha) = 110 Kannen = 200.09 L;
 1 **Biermaß** or **Pot** (for beer in Coburg) = 954 mL;
 1 **Pfund Oel** (for beer in Gotha) = 500 mL.

80.35.7 Units of Weight

For mercantile use in Coburg between 1858 and 1872

				Metric
Centner				46.771 13 kg
100	Pfund			467.711 3 g
3200	32	Loth		14.616 g
22,400	224	7	Quentche	2.088 g

For mercantile use in Gotha before 1858 and between 1858 and 1872

				Metric	Metric
Centner				51.414 440 kg	51.448 24 kg
110	Pfund			467.404 g	467.711 3 g
3520	32	Loth		14.606 g	14.616 g
24,640	224	7	Quentche	3.652 g	2.088 g

For gold and silver

			Metric
Vereinsmark			233.855 g
16	Loth		14.616 g
288	18	Gran	811.996 mg

For gold and silver in Gotha before 1837 and after 1837

							Metric	Metric
Mark							233.702 000 g	233.855 500 g
8	Unze						29.212 750 g	29.231 937 g
16	2	Loth					14.606 375 g	14.615 969 g
64	8	4	Quentchen				3.651 594 g	3.653 992 g
256	32	16		Pfennig			912.898 mg	913.498 mg
512	64	32	8	2	Heller		456.449 mg	456.749 mg
65,536	8192	4096	1024	256	128	Richtpfennig	3.566 mg	3.568 mg

For medical use in Gotha before 1843 and after 1843

					Metric	Metric
Pfund					357.853 800 g	350.783 250 g
12	Unze				29.821 150 g	29.231 937 g
96	8	Drachme			3.727 644 g	3.653 992 g
288	24	3	Skrupel		1.242 548 g	1.217 997 g
5760	480	60	20	Gran	62.127 mg	60.900 mg

Other reported measures:

1 **Handels-Pfund** (in Coburg) = 509.88 g.

80.36 Saxe-Lauenburg

This Duchy was partitioned from the Duchy of Sazony in 1296. The Duchy was dissolved during the Napoleonic Wars between 1803 and 1814. In 1876, it was merged into Prussia.

In 1866, the weights and measures used in Prussia were legally adopted.

80.36.1 Currency

1850–1868: 1 Thaler = 48 Schillinge =
576 Pfennige

–1850: 1 Thaler = 3 Mark = 48 Schillinge
= 576 Pfennige

80.36.2 Units of Length

At Ratzeburg

						Metric
Meile						7363.025 920 m
1600	Ruthe					4.601 891 m
12,800	8	Elle				575.236 mm
25,600	16	2	Fuss			287.618 mm
307,200	192	24	12	Zoll		23.968 mm
3,686,400	2304	288	144	12	Linie	1.997 mm

Some other reported measures:

- 1 Elle (lauenburgische) = 637.000 mm;
- 1 Fuss (lauenburgische) = 293.000 mm.

80.36.3 Units of Area

At Ratzeburg

			Metric
Morgen			2541.288 3 m ²
120	Quadrat Ruthe		21.177 403 m ²
30,720	256	Quadrat Fuss	8.272 4 dm ²

80.36.4 Units of Dry Capacity

At Ratzeburg

							Metric
Last							3968.640 000 L
8	Drömt						496.080 000 L
24	3	Sack					165.360 000 L
96	12	4	Scheffel				41.340 000 L
144	18	6	1½	Himpten			27.560 000 L
576	72	24	6	4	Spint		6.890 000 L
2304	288	96	24	16	4	Metze	1.722 500 L

80.36.5 Units of Liquid Capacity

At Ratzeburg

					Metric
Oxhoft					217.363 200 L
1 ²⁷ / ₃₃	Tonne				119.549 760 L
60	33	Stübchen			3.622 720 L
120	66	2	Kanne		1.811 360 L
240	132	4	2	Quartier	905.680 mL

80.36.6 Units of Weight

Mercantile upper scale used before 1820

						Metric
Commerzlast						3049.38 kg
$21\frac{3}{7}$	Schiffspfund					142.304 4 kg
$53\frac{3}{7}$	$2\frac{1}{2}$	Centner				56.921 76 kg
$272\frac{9}{11}$	$12\frac{9}{11}$	$5\frac{1}{11}$	Stein			11.181 06 kg
$428\frac{3}{7}$	20	8	$1\frac{3}{7}$	Liespfund		7.115 22 kg
6000	280	112	22	14	Pfund	508.23 g

Mercantile lower scale used before 1820

						Metric
Pfund						508.23 g
2	Mark					254.115 g
16	8	Unz				31.764 g
32	16	2	Loth			15.882 g
256	128	16	8	Quentchen		1.985 g
512	256	32	16	2	Reichpfennig	992.636 mg

Stadtgewicht used between 1820 and 1861

									Metric
Commerzlast									2918.844 kg
$1\frac{1}{5}$	Schiffslast								2432.370 kg
$21\frac{3}{7}$	$17\frac{3}{7}$	Schiffspfund							136.212 720 kg
$53\frac{3}{7}$	$44\frac{3}{14}$	$2\frac{1}{2}$	Centner						54.485 088 kg
$272\frac{9}{11}$	$227\frac{9}{11}$	$12\frac{9}{11}$	$5\frac{1}{11}$	Stein					10.702 428 kg
$428\frac{3}{7}$	$357\frac{3}{7}$	20	8	$1\frac{3}{7}$	Liespfund				6.810 636 kg
6000	5000	280	112	22	14	Pfund			486.474 g
192,000	160,000	8960	3584	704	448	32	Loth		15.202 g
768,000	640,000	35,840	14,336	2816	1792	128	4	Quentchen	3.800 g

Normalgewicht used between 1820 and 1861

				Metric
Centner				54.287 274 kg
112	Pfund			484.708 g
3584	32	Loth		15.147 g
14,336	128	4	Quentchen	3.787 g

Metric-linked system at Ratzeburg between 1862 and 1872

						Metric
Schiffslast						2600 kg
52	Centner					50 kg
5200	100	Pfund				500 g
52,000	1000	10	Zehntelpfund			50 g
520,000	10,000	100	10	Quentin		5 g
5,200,000	100,000	1000	100	10	Ortgen	500 mg

For medical use at Ratzeburg before 1862, and between 1862 and 1872

					Metric	Metric
Medicinal Pfund					357.853 800 g	360 g
12	Unze				29.821 150 g	30 g
96	8	Drachme			3.727 644 g	3.750 g
288	24	3	Skrupel		1.242 548 g	1.250 g
5760	480	60	20	Gran	62.127 mg	62.5 mg

For gold and silver at Ratzeburg before 1856

								Metric
Pfund								467.364 200 g
2	Mark							233.682 100 g
16	8	Unze						29.210 262 g
32	16	2	Loth					14.605 131 g
128	64	8	4	Quentchen				3.651 283 g
512	256	32	16	4	Pfennig			912.821 mg
1024	512	64	32	8	2	Heller		456.410 mg
131,072	65,536	8192	4096	1024	256	128	Richtpfennig	3.566 mg

For gold and silver at Ratzeburg between 1856 and 1872

					Metric
Mark					233.855 500 g
8	Unze				29.231 937 g
16	2	Loth			14.615 969 g
64	8	4	Quentchen		3.653 992 g
256	32	16	4	Pfennig	913.498 mg

Other reported measures:

1 **Juwelen Karat** (for diamonds and jewels) =
205.894 mg.

**80.37 Saxe-Meiningen
(-Hildburghausen)**

This Duchy, founded in 1681, was extended by Hildburghausen and Saalfeld in 1825. The Free State of Saxe-Meiningen was merged into the state of Thuringia in 1920.

80.37.1 Currency

1837–1874: 1 Gulden = 60 Kreuzer =
 240 Pfennige = 480 Heller
–1837: 1 Thaler = 18 Batzen = 24 Gro-
 schen = 90 Kreuzer

80.37.2 Units of Length

In Meiningen

				Metric
Ruthe				4.240 6 m
14	Fuß			302.9 mm
168	12	Zoll		25.242 mm
2016	144	12	Linie	2.103 mm

At Saalfeld

				Metric
Ruthe				4.528 m
16	Fuß			283.0 mm
168	12	Zoll		23.583 mm
2016	144	12	Linie	1.965 mm

Traditional system and scale used in Hildburghausen

			Metric	Metric
Werkfuß			283.150 mm	287.618 mm
12	Zoll		23.596 mm	23.968 mm
144	12	Linie	1.966 mm	1.997 mm

Scale used between 1825 and 1872

			Metric
Vermessungsruthe			4.255 622 m
14	Verme- ssungsfuß		303.973 mm
168	12	Zoll	25.33 mm

Other reported measures:

Elle (for cloth) = 559.0 mm.

80.37.3 Units of Area

In Meiningen before 1825

			Metric
Acker			2877.230 m ²
160	Quadratruthe		17.982 688 m ²
31,360	196	Quadratfuß	9.174 84 dm ²

In Meiningen between 1825 and 1872

			Metric
Acker			2897.651 m ²
160	Quadratvermessungsruthe		18.110 319 m ²
31,360	196	Quadratvermessungsfuß	9.239 96 dm ²

In Saalfeld

			Metric
Acker			3083.106 m ²
160	saalfelder Quadratruthe		19.269 413 m ²
38,496	240⅔	saalfelder Quadratfuß	8.008 90 dm ²

80.37.4 Units of Volume

For firewood

		Metric
Klafter (6 × 6 × 3½ Werkfuß)		3.538 959 m ³
126	Kubikwerkfuß	28.087 dm ³

80.37.5 Units of Dry Capacity

In Hildburghausen and in Meiningen

			Metric	Metric
Getreide- Malter			208.875 200 L	167.100 000 L
8	Maß		26.109 400 L	20.887 500 L
32	4	Metzen	6.527 350 L	5.221 875 L

Some other reported measures:

- 1 **Malter** (for rough fruit in Hildburghausen) = 239.29 L;
1 **Kornmalter** (for grain, wheat and legumes in Hildburghausen) = 206.933 L;
1 **Malter** (for smooth fruit in Hildburghausen) = 206.92 L;

80.37.6 Units of Liquid Capacity

In Hildburghausen

				Metric
Ohm				130.900 000 L
2	Eimer			65.450 000 L
64	32	Schenkmaaß		2.045 312 L
144	72	2¼	Maß	909.028 mL

In Meiningen

					Metric
Ohm					145.800 000 L
2	Eimer				72.900 000 L
72	36	Kanne			2.025 000 L
144	72	2	Maß		1.012 500 L
288	144	4	2	Kärtchen	506.250 mL

80.37.7 Units of Weight

For mercantile use until 1859

				Metric
Centner				50.999 600 kg
100	Pfund			509.996 g
3200	32	Loth		15.937 g
12,800	128	4	Quentchen	3.984 g

Metric-linked upper scale after 1859

					Metric
Schiffslast					2000 kg
2	Tonne				1000 kg
13⅓	6⅔	Schiffspfund			150 kg
40	20	3	Centner		50 kg
4000	2000	300	100	Pfund	500 g

Metric-linked lower scale after 1859

					Metric
Pfund					500 g
30	Lot				16.667 g
300	10	Quentchen			1.667 g
3000	100	10	Zent		166.7 mg
30,000	1000	100	10	Korn	16.7 mg

For gold and silver

			Metric
Mark			233.855 g
16	Loth		14.616 g
288	18	Gran	812.00 mg

For medical use

					Metric
Medicinal Pfund					357.853 800 g
12	Unze				29.821 150 g
96	8	Drachme			3.727 644 g
288	24	3	Skrupel		1.245 548 g
5760	480	60	20	Gran	62.13 mg

80.38 Saxe-Weimar-Eisenach

This Duchy was created in 1809 by the merger of the duchies of Saxe-Weimar and Saxe-Eisenach, which had been in personal union since 1741. It became a Grand Duchy in 1815. In 1920, it was merged into the state of Thuringia.

80.38.1 Currency

1841–1876: 1 Thaler = 30 Silbergroschen = 360 Pfennig
1761–1841: 1 Thaler = 24 guten Groschen = 288 Pfennig = 576 Heller

80.38.3 Units of Area

In Eisenach

		Metric
Acker		2850.14 m ²
140	Quadratruthe	20.358 144 m ²

In Kranichfeld

		Metric
Acker		3268.864 m ²
160	Quadratruthe	20.430 4 m ²

80.38.2 Units of Length

Two reported scales in Weimar before January 1, 1872

									Metric	Metric
Meile^a									7363.025 203 m	7363.061 760 m
1632	Ruthe								4.511 658 m	4.511 680 m
4352	2 ² / ₃	Klafter							1.691 871 6 m	1.691 880 m
13,056	8	3	Elle						563.957 2 mm	563.960 mm
16,320	10	3 ³ / ₄	1 ¹ / ₄	dezimal Fuß					451.165 8 mm	451.168 mm
26,112	16	6	2	1 ¹ / ₅	Fuß^b				281.978 6 mm	281.980 mm
313,344	192	72	24	19 ¹ / ₅	12	Zoll			23.498 217 mm	23.498 3 mm
3,760,128	2304	864	288	230 ² / ₅	144	12	Linie		1.958 2 mm	1.958 2 mm
37,601,280	23,040	8640	2880	2304	1440	120	10	Punkt	195.82 µm	195.82 mm

^a1 Chaussee-Meile = 7363.026 m

^bAt Eisenach = 282.0 mm and at Kranichfeld = 282.5 mm

In Weimar before 1871

					Metric
Acker					2849.735 9 m ²
140	Quadratruthe				20.355 256 m ²
89,600	64	Quadratelle			31.805 088 dm ²
358,400	256	4	Quadratfuß		7.951 272 dm ²
1,433,600	1024	16	4	Quadratzoll	1.987 818 dm ²

80.38.4 Units of Volume

For general use in Weimar

					Metric
Kubikruthe					91.836 4 m ³
512	Kubikelle				179.368 dm ³
4096	8	Kubikfuß			22.421 dm ³
7,077,888	13,824	1728	Kubikzoll		12.975 cm ³

For timber in Weimar

			Metric
Kubikklafter			4.842 935 m ³
1 ⁷ / ₈	Klafter		2.825 045 m ³
216	126	Kubikfuß	22.421 dm ³

Some other measures used in the area:

- 1 **erfurter Malter** = 12 Scheffel = 48 Metzen = 715.358 L;
- 1 **bürgelsche Scheffel** = 4 Vierteln = 204.863 L;
- 1 **crayenberger Malter** = 16 Metzen = 190 L;
- 1 **dornburger Scheffel** = 32 Metzen = 182.81 L;

80.38.5 Units of Dry Capacity

Traditional system and scale used in Eisenach

						Metric	Metric
Malter						150.588 L	304.687 L
2	Scheffel					75.294 L	152.343 L
8	4	Viertel				18.823 5 L	38.086 L
32	16	4	Metze			4.705 88 L	9.521 47 L
160	80	20	5	Marktmaß		941.175 L	1.904 3 L
320	160	40	10	2	Marktnösel	470.588 mL	952.149 mL

In Jena

						Metric
Getreide-Scheffel						160.12 L
4	Viertel					40.03 L
16	4	Maß				10.01 L
32	8	2	Metze			5.004 L
100	25	6 ¹ / ₄	3 ³ / ₈	Kanne		1.601 L
320	80	20	10	3 ¹ / ₂	Nösel	500.375 mL

In Weimar

						Metric
Malter						903.487 200 L
12	Scheffel					75.290 600 L
48	4	Viertel				18.822 650 L
192	16	4	Metze			4.705 662 L
960	80	20	5	Maß		941.132 mL
1920	160	40	10	2	Nösel	470.566 mL

1 **fuldaer Malter** = 16 Metzen = 175.578 L;1 **haeager Malter** = 8 Maass = 167.5 L;1 **dresdner Scheffel** = 16 Metzen = 103.985 L;1 **apoldaer Scheffel** = 16 Metzen = 96 Kannen
= 86.777 L;1 **buttstedter Scheffel** = 16 Metzen = 76.42 L;1 **preussische Scheffel** = 54.961 5 L;1 **nordhäuser Scheffel** = 4 Vierteln = 45.632 L;**80.38.6 Units of Liquid Capacity**

In Eisenach

			Metric
Eimer			71.708 5 L
40	Kanne		1.793 L
80	2	Maß	896.36 mL

In Kranichfeld

			Metric
Eimer			86.685 L
72	Maß		1.204 L
144	2	Nösel	601.98 mL

Two reported scales for customary use in Weimar

				Metric	Metric
Schenk-Eimer				71.708 5 L	71.705 3 L
80	Schenk-Maß			896.356 mL	896.316 mL
120	1½	Seidel		597.571 mL	597.544 mL
160	2	1⅓	Schenknösel	448.178 mL	448.158 mL

Two reported scales for beer in Weimar

				Metric	Metric
Eimer				71.708 5 L	71.705 3 L
72	Ohmmaß			995.951 mL	995.907 mL
144	2	Nösel		497.976 mL	497.953 mL

80.38.7 Units of Weight

Before July 1, 1858

						Metric
Centner^a						74.833 76 kg
5	Stein					14.966 752 kg
110	22	Pfund				467.711 g
3520	704	32	Loth			21.260 g
14,080	2816	128	4	Quentchen		5.315 g

^aIn Eisenach = 100, 108 or 110 Pfund

From July 1, 1858 to January 1, 1872

							Metric
Schiffslast							2000 kg
40	Centner						50 kg
4000	100	Pfund					500 g
120,000	3000	30	Loth				16.667 g
1,200,000	30,000	300	10	Quentchen			1.667 g
12,000,000	300,000	3000	100	10	Zent		166.7 mg
120,000,000	3,000,000	30,000	1000	100	10	Korn	16.7 mg

For gold and silver

		Metric
Vereinsmark		233.855 g
288	Gran	812.00 mg

For medical use

						Metric
Medicinalpfund						350.783 g
12	Unze					29.232 g
96	8	Drachme				3.654 g
288	24	3	Skrupel			1.218 g
5760	480	60	20	Gran		60.90 mg

80.39 Saxony-Anhalt

Saxony-Anhalt was formed as a province of Prussia in 1945. When Prussia was disbanded in 1947, the province became the state of Saxony-Anhalt, and became part of the German Democratic Republic in 1949. From 1952 to 1990, Saxony-Anhalt was divided into the East German districts of Halle and Magdeburg. In 1990, the districts were reintegrated as a state.

80.39.1 Units of Length

For surveying at Halle an der Saale, present-day Halle

		Metric
Ruthe		4.329 500 m
10	pieds d’arpentage	432.950 mm

In Magdeburg before 1871

				Metric
Walsrute or Teichrute				4.493 6 m
1½	Feldrute			3.931 9 m
8	7	Elle		561.70 mm
16	14	2	Fuß^a	280.85 mm

^a[MART3] reported it as 283.60 mm

80.39.2 Units of Area

For agricultural use

			Metric
Acker			2473.6 m ²
1½	Hufe-Acker		1855.2 m ²
160	120	Quadrat-Feldruten	15.46 m ²

For forest areas

			Metric
Wald-Acker			3230.8 m ²
1½	Waldhufe		2423.1 m ²
160	120	Quadrat-Waldruten	20.192 5 m ²

80.39.3 Units of Volume

Some reported measures:

- 1 **Klafter** (for firewood at Blankenburg) =
 2 Malter = $6\frac{2}{3} \times 4 \times 4\frac{3}{4}$ Fuß = $120\frac{2}{3}$
 Kubikfuß = 2.995 781 m³;
 1 **Malter** (for firewood at Blankenburg) = 1/2
 Klafter = $3\frac{1}{6} \times 4 \times 4\frac{3}{4}$ Fuß = 60% Kubikfuß =
 1.497 890 m³.

80.39.4 Units of Dry Capacity

In Magdeburg

				Metric
Malter				161.312 L
4	Scheffel ^a			40.328 L
16	4	Metze		10.082 L
64	16	4	Mäßchen	2.520 5 L

^a[MART3] reported it as 51.648 L

Other reported measures:

- 1 **Scheffel** (in Holzhausen) = 105.876 6 L;
 1 **Scheffel** (in Herrengosserstedt) = 108.229 3 L.

80.39.5 Units of Liquid Capacity

For wine and spirits in Magdeburg

				Metric
Eimer				36.755 L
18	Kanne			2.042 L
36	2	Maß		1.021 L
72	4	2	Nösel	510.5 mL

For beer in Magdeburg

					Metric
Faß					174.875 L
5	Eimer				34.975 L
100	20	Kanne			1.748 75 L
200	40	2	Maß		874.375 mL
400	80	4	2	Nösel	437.187 5 mL

80.39.6 Units of Weight

For salt in Halle

			Metric
Last			1515.384 kg
60	Scheffel		25.256 kg
3240	54	Pfund	467.71 g

Other reported measures:

- 1 **Pfund** (at Magdeburg) = 470.447 g.

80.40 Kingdom of Saxony

In 850, Ludolf became the first Margrave of Saxony. In 1260, Saxony was divided into Saxe-Lauenburg and Saxe-Wittenberg. Ernest, Elector of Saxony from 1464 to 1486, became the founder of the Ernestine line of Saxon princes. In 1485, Saxony was split into several small Ernestine states (see also *Saxe-Altenburg*, *Saxe-Coburg*, *Saxe-Meiningen* (*-Hildburghausen*) and *Saxe-Weimar-Eisenach*). In 1806, Saxony became a Kingdom unto itself. In 1918, the last king of Saxony abdicated and it became the Free State of Saxony. After World War II, Saxony was part of the Soviet zone of occupation (SBZ), and part of East Germany from 1949 until the unification of Germany in 1990.

80.40.1 Currency

- 1857–1874: 1 Saxon Vereinsthaler =
 30 Neugroschen = 300 Pfennige
 1841–1857: 1 Saxon Thaler = 30 Neugroschen
 = 300 Pfennige
 1754–1840: 1 Saxon Saxon Thaler = 24 guten
 Groschen = 288 Pfennige

80.40.2 Units of Length

Upper scale before 1840

			Metric
Sächsische Postmeile			9 062.08 m
2	Wegstunde		4 531.04 m
2000	1000	Straßenrute	4.531 04 m

Middle scale

				Metric
Straßenrute				4.531 04 m
$1\frac{1}{3}$	Ackerrute			3.398 28 m
$2\frac{2}{3}$	2	Klafter		1.699 14 m
4	3	$1\frac{1}{2}$	Stab	1.132 76 m

Lower scale

					Metric
Stab					1.132 76 m
2	Elle				566.38 mm
4	2	Fuß			283.19 mm
48	24	12	Zoll		23.599 mm
576	288	144	12	Linie	1.967 mm

In Dresden during the eighteenth century

		Metric
Rute		4.529 705 m
16	Fuß	283.107 mm

In Dresden before 1858

								Metric
Postmeile								9066.666 667 m
2000	Strassenrute							4.533 333 m
$2109\frac{8}{91}$	$1\frac{5}{91}$	Feldmesserrute						4.297 222 m
8000	4	$3\frac{19}{24}$	Stab					1.133 333 m
16,000	8	$7\frac{7}{12}$	2	Elle				566.667 mm
32,000	16	$15\frac{1}{6}$	4	2	Fuß			283.333 mm
384,000	192	182	48	24	12	Zoll		23.611 mm
4,608,000	384	2184	576	288	144	12	Linie	1.968 mm

In Dresden before 1858

				Metric
Feldmesserrute				4.297 222 m
10	Dezimalfuß			429.722 mm
100	10	Dezimalzoll		42.972 mm
1000	100	10	Dezimallinie	4.297 mm

In Dresden in 1858

						Metric
Polizeimeile						9 062.08 km
$1\frac{1}{3}$	Postmeile^a					6 796.56 km
2000	1500	Strassenrute				4.531 04 m
32,000	24,000	16	Fuß			283.190 mm
384,000	288,000	192	12	Zoll		23.599 mm
3,840,000	2,880,000	1920	120	10	Partie	2.359 9 mm

^aBetween 1858 and 1871, reported as 7500 m

In Dresden between 1858 and 1871

									Metric
Kette									42.950 499 m
$9\frac{23}{48}$	Strassen-Ruthe								4.531 042 m
10	$1\frac{1}{61}$	Feldmesser-Ruthe							4.295 050 m
$25\frac{5}{18}$	$2\frac{2}{3}$	$2\frac{19}{36}$	Klafter						1.699 141 m
$37\frac{11}{12}$	4	$3\frac{19}{24}$	$1\frac{1}{2}$	Stab					1.132 760 m
$75\frac{13}{18}$	8	$7\frac{1}{12}$	3	2	Elle				566.380 mm
$151\frac{7}{3}$	16	$15\frac{5}{6}$	6	4	2	Fuss			283.190 mm
1820	192	182	72	48	24	12	Zoll		23.599 mm
21,840	2304	2184	864	576	288	144	12	Linie	1.967 mm

At Leipzig, based on [MART3]

							Metric
Ruthe							4.284 583 m
182/72	Klafter						1.695 000 m
91/24	$1\frac{1}{2}$	Stab					1.130 000 m
91/12	3	2	Elle				565.000 mm
$15\frac{5}{6}$	6	4	2	Fuß			282.500 mm
182	72	48	24	12		Zoll	15.694 mm

At Leipzig

		Metric
Ruthe		4.522 486 m
16	Fuß	282.655 mm

Other reported measures:

- 1 **Duetsche Postmeile** (after 1840) = 7500 m.
- 1 **Lachter** (used in the mining industry) = 7 Fuß
= about 1.982 m, but after 1830 (in Leipzig)
reported as exactly 2 m;
- 1 **brabanter Elle** (at Leipzig) = 685.600 mm;
- 1 **Baufuss** (at Leipzig) = 283.150 mm.

Between 1858 and 1871

			Metric
Ruthe or Feldmes-serruthe			4.295 m
10	Zehntelruthe		429.5 mm
100	10	Zoll or Dezimalzoll	42.95 mm

Metric-linked system (names temporarily used in 1871)

				Metric
Kette				10 m
10	Meter			1 m
1000	100	Neuzoll		10 mm
10,000	1000	10	Strich	1 mm

For yarn in general

			Metric
Bündel			54,863.51 m
20	Strang		2743.175 5 m
200	10	Strehn	274.317 55 m

For vicuna yarn

				Metric
Strähn				452.0 m
5	Gebinde			90.4 m
400	80	Faden		1.13 m
800	160	2	Leipziger Elle	565 mm

For hand-spun linen yarn

					Metric
Strähn					1359.312 m
2	Zaspel				679.656 m
40	20	Gebind			33.983 m
800	400	20	Faden		1.699 m
2400	1200	60	3	Dresdener Elle	566.38 mm

For worsted yarn

		Metric
Zaspel		678 m
1200	alte Leipziger Elle	565 mm

For carded yarn

		Metric
Zaspel		452 m
800	alte Leipziger Elle	565 mm

For linen

				Metric
Zaspel				921.71 m
20	Gebinde			46.085 m
400	20	Faden		2.304 m
1600	80	4	Breslauer Elle	576.069 mm

metric-linked system for silk

			Metric
Strähn			12,000 m
4	Gebinde		3000 m
12,000	3000	Faden	1 m

80.40.3 Units of Area

In Dresden before 1858 and between 1858 and 1871

				Metric	Metric
Acker				5539.835 1 m ²	5534.236 3 m ²
2	Morgen			2769.917 5 m ²	2767.118 2 m ²
300	150	Quadrat-Feldmesserruthe		18.466 07 m ²	18.447 454 m ²
69, 008⅓	34, 504⅙	230⅓ ₃₆	Quadratfuß	8.027 76 dm ²	8.019 66 dm ²

In some districts

		Metric
Königshufe		477,140 m ²
62	Acker	7695.8 m ²

In the Ore Mountains (Erzgebirge)

			Metric
Pfarriehn			398,440 m ²
2	Hufe		199,220 m ²
72	36	Akker	5533.89 m ²

In Leipzig before 1872

					Metric
Großer Morgen					3284.85 m ²
1%	Kleiner Morgen				1847.73 m ²
160	90	Quadratrute			20.530 m ²
284%	160	1%	Quadrat-Ackerrute		11.548 m ²
10,240	5760	64	36	Quadratelle	32.079 dm ²

Other reported measures:

1 **Fundgrube** (for mining, 60 × 40 Lachter) =
9600 m²;

1 **Morgen** (in Dresden) = 2767.12 m².

80.40.4 Units of Volume

				Metric
Kubikelle				181,686.947 086 072 cm ³
8	Kubikfuß			22,710.868 385 759 cm ³
13,824	1728	Kubikzoll		13.142 864 cm ³

In Dresden between 1858 and 1871

				Metric
Schragen				7.358 321 m ³
3	Klafter			2.452 774 m ³
324	108	Kubik Fuss		22.710 87 dm ³

80.40.5 Units of Dry Capacity

In Dresden and at Leipzig before 1858 and between 1858 and 1871

						Metric	Metric
Wispel						2538.902 L	291.772 800 L
2	Malter					1269.451 L	1245.943 200 L
24	12	Scheffel				105.787 583 L	103.828 600 L
96	48	4	Viertel			26.446 896 L	25.957 150 L
384	192	16	4	Metze		–	6.489 287 L
1536	768	64	16	4	Mäßchen	–	1.622 322 L

For coal in Dresden

					Metric
Karren					622.971 600 L
3	Tonne^a				207.657 200 L
6	2	Scheffel^a			103.828 600 L
10	3½	1⅓	Kübel		62.297 160 L

^aAlso used for charcoal, ampetite and lime

For wholesale in Leipzig

		Metric
Wispel		1297.858 L
2	Malter	648.929 L

Other reported measures:

1 **Last** (for wheat and rye in Dresden between 1858 and 1871) = 6 Whispel = 14,951.318 400 L;

1 **Last** (for oats and barley in Dresden between 1858 and 1871) = 2 Whispel = 4983.772 800 L;

1 **Lowry** (for charcoal in Dresden between 1858 and 1871) = 50 Scheffel = 5191.430 L;

1 **Heinzen** = 8 Merseburger Maß = 82.2 L.

80.40.6 Units of Liquid Capacity

For wine and brandy in Dresden

											Metric
Fuder											
1⅓	Kufe										808.348 032 L
2	1⅔	Faß									673.623 360 L
4	3⅓	2	Oxhoft								404.174 016 L
6	5	3	1½	Ohm							202.087 008 L
12	10	6	3	2	Eimer						134.724 672 L
24	20	12	6	4	2	Anker					67.362 336 L
36	30	18	9	6	3	1½	Hose				33.681 168 L
576	480	288	144	96	48	24	16	Visirkanne			22.454 112 L
864	720	432	216	144	72	36	24	1½	Kanne		1.403 382 L
1728	1440	864	432	288	144	72	48	3	2	Nösel	935.588 mL
											467.794 mL

For beer in Dresden

										Metric
Gebräude										9430.727 040 L
12	Kufe									785.893 920 L
24	2	Faß								392.946 960 L
48	4	2	Viertel							196.473 480 L
96	8	4	2	Tonne						98.236 740 L
140	11 $\frac{2}{3}$	5 $\frac{1}{6}$	2 $\frac{1}{12}$	1 $\frac{1}{24}$	Eimer					67.362 336 L
280	23 $\frac{1}{3}$	11 $\frac{1}{3}$	5 $\frac{1}{6}$	2 $\frac{1}{12}$	2	Anker				33.681 168 L
560	46 $\frac{2}{3}$	23 $\frac{2}{3}$	11 $\frac{2}{3}$	5 $\frac{1}{6}$	4	2	Aichkanne			16.840 584 L
6720	560	280	140	70	48	24	12	Bier Kanne		1.403 382 L
10,080	840	420	210	105	72	36	18	1 $\frac{1}{2}$	Dresdener Kanne	935.588 mL

For beer in Leipzig

								Metric
Gebräude								5777.6 L
8	Kufe							722.2 L
16	2	Faß						361.1 L
32	4	2	Viertel					180.55 L
64	8	4	2	Tonne				90.28 L
152 $\frac{8}{21}$	9 $\frac{1}{21}$	4 $\frac{16}{21}$	2 $\frac{8}{21}$	1 $\frac{4}{21}$	Eimer^a			75.83 L
304 $\frac{16}{21}$	19 $\frac{1}{21}$	9 $\frac{1}{21}$	4 $\frac{16}{21}$	2 $\frac{8}{21}$	2	Anker		37.92 L
9600	600	300	150	75	63	31 $\frac{1}{2}$	Kanne	1.204 L

^a[KAHN] reported 1 **Biereimer** = 1 $\frac{1}{2}$ Weineimer = 86.688 L

For beer in Leipzig, based on [MART3]

								Metric
Gebräude								8322.048 000 L
8	Kufe							1040.256 000 L
16	2	Fass						520.128 000 L
32	4	2	Viertel					260.064 000 L
64	8	4	2	Tonne				130.032 000 L
96	12	6	3	1 $\frac{1}{2}$	Eimer			86.688 000 L
6912	864	432	216	108	72	Schenkkanne		1.204 000 L
13,824	1728	864	432	216	144	2	Nösel	602.000 mL

For wine in Leipzig, based on [MART3]

											Metric
Fuder											910.224 000 L
2⅔	Fass										379.260 000 L
4	1⅔	Oxhoft^a									227.556 000 L
4½	1⅛	1⅛	Oxhoft^b								202.272 000 L
6	2½	1½	1⅓	Ohm							151.704 000 L
12	5	3	2⅔	2	Eimer^c						75.852 000 L
24	10	6	5⅓	4	2	Anker					37.926 000 L
648	270	162	144	108	54	27	Visirkanne				1.404 667 L
756	315	189	168	126	63	31½	1%	Schenk- kanne			1.204 000 L
1512	630	378	336	252	126	63	2⅔	2	Nösel		602.000 mL
6048	2520	1512	1344	1008	504	252	9⅓	8	4	Quartier	150.500 mL

^aUsed for aquavite from France. Aquavite was also sold by the Fass = 3 Eimer = 206.105 640 L

^bUsed for wine from France

^cOne Eimer (for aquavite) = 68.701 880 L

Other reported measures:

1 **Bierfass** (for beer) = 4 Tonnen = 420 Kannen
= 393.952 L;

1 **Tonne** = 105 Kannen = 98.237 7 L;

1 **Eimer** (in Leipzig) = 63 Kannen = 58.942 6 L;

1 **Aichkarme** = 18 Kannen = 16.840 7 L.

80.40.7 Units of Weight

In Dresden before 1858

										Metric
Schiffpfund										154.180 620 kg
3	Centner									51.393 540 kg
7½	2½	Waage Eisen								20.557 416 kg
15	5	2	Stein							10.278 708 kg
330	110	44	22	Pfund						467.214 000 g
660	220	88	44	2	Mark					233.607 000 g
5280	1760	704	352	16	8	Unze				29.200 875 g
10,560	3520	1408	704	32	16	2	Loth			14.600 437 g
42,240	14,080	5632	2816	128	64	8	4	Quentchen		3.650 109 g
168,960	56,320	22,528	11,264	512	256	32	16	4	Pfennig	912.527 mg

In Dresden and Leipzig between 1858 and 1871

										Metric
Schiffslast										2000 kg
13⅓	Schiffpfund									150 kg
40	3	Centner								50 kg
200	15	5	Stein							10 kg
4000	300	100	20	Pfund						500 g
120,000	9000	3000	600	30	Loth					16.667 g
1,200,000	90,000	30,000	6000	300	10	Quent				1.667 g
12,000,000	900,000	300,000	60,000	3000	100	10	Zent			166.7 mg
120,000,000	9,000,000	3,000,000	600,000	30,000	1000	100	10	Korn		16.7 mg

In Leipzig between 1837 and 1858, based on [MART3]

										Metric
Schiffpfund										154.316 118 kg
3	Centner									51.438 706 kg
7½	2½	Waage Eisen								20.575 482 kg
15	5	2	Stein							10.287 741 kg
330	110	44	22	Pfund						467.625 g
10,560	3520	1408	704	32	Loth					14.613 g
42,240	14,080	5632	2816	128	4	Quentchen				3.653 g
168,960	56,320	22,528	11,264	512	16	4		Pfennig-gewicht		913 mg
337,920	112,640	45,056	22,528	1024	32	8		2	Hellergewicht	457 mg

Some measures reported as used in the iron ore mining industry before 1862:

1 **Fuder** (in Bad Gottleuba-Berggießhübel) = 22 Zentner;

1 **Fuder** (in Johannegeorgenstadt) = between 16⅘ Zentner 5 Pfund and 25⅘ Zentner 7½ Pfund;

1 **Fuder** (in Schwarzenberg) = between 16⅘ Zentner and 24⅘ Zentner 8¾ Pfund;

1 **Fuder** (in Eibenstock) = between 16¼ Zentner 10 Pfund and 16⅘ Zentner 11¼ Pfund.

For medical use before 1868^a

					Metric
Pfund					357.567 g
12	Unze				29.797 25 g
96	8	Drachme			3.724 656 g
288	24	3	Scrupel		1.241 552 g
5760	480	60	20	Grän	62.078 mg

^aAfter 1868, the **Gramm** was used

For gold and silver in Dresden before 1858 and Leipzig before 1830

							Metric
Mark							233.607 000 g
8	Unze						29.200 875 g
16	2	Loth					14.600 437 g
64	8	4	Quentchen				3.650 109 g
256	32	16	4	Pfennig			912.527 mg
512	64	32	8	2	Heller		456.264 mg
65,536	8192	4096	1024	256	128	Richpfennig	3.564 6 mg

80.41 Schaumburg-Lippe

For gold and silver in Leipzig between 1830 and 1858

				Metric
Mark				233.812 300 g
8	Unze			29.226 537 g
16	2	Loth		14.613 269 g
64	8	4	Quentchen	3.653 317 g

For fine use in Dresden before 1858

			Metric
Mark			233.607 000 g
67	Dukat		3.486 672 g
4422	66	Dukaten-As	52.828 mg

Other reported measures:
1 **Mark** (for money in Dresden before 1858) = 233.855 5 g.

Schaumburg-Lippe arose from the division of Schaumburg-Gehmen into Hesse-Cassel and Lippe-Alverdissen in 1640, into Schaumburg-Hessen and Schaumburg-Lippe, with half of Schaumburg-Bückeburg being inherited later that year. Schaumburg-Lippe became a Principality in 1807. After the First World War, Schaumburg-Lippe became a free state within the Weimar Republic. In 1946, it became part of Lower Saxony.

80.41.1 Currency

1858–1872: 1 Thaler = 30 Silbergroschen = 360 Pfennigen
1843–1858: 1 Thaler = 24 gute Groschen = 288 Pfennigen
1753–1843: 1 Thaler = 36 Mariengroschen = 72 Mattier = 288 Pfennigen = 576 Heller

For gold and silver in Dresden between 1858 and 1871

				Metric
Pfund				500 g
500	Gramm			1 g
1000	2	Millesimi or Tausendstheil		500 mg
10,000	20	10	Ass	50 mg

80.41.2 Units of Length

Traditional system

						Metric
Ruthe						4.641 6 m
2 $\frac{7}{8}$	Lachter					2.030 7 m
8	3 $\frac{1}{2}$	Elle				580.20 mm
16	7	2	Fuß			290.10 mm
192	84	24	12	Zoll		24.175 mm
2304	1008	288	144	12	Linie	2.014 6 mm

Metric-linked system

				Metric
Elle				500 mm
10	Fuß			50 mm
100	10	Zoll		5 mm
1000	100	10	Linie	500 µm

For yarn at Bückeburg

				Metric
grosse Stück				3063.456 m
20	Bind			153.172 8 m
1320	66	Faden		2.320 8 m
5280	264	4	Elle	580.2 mm

For yarn at Bückeburg

				Metric
kleine Stück				1531.728 m
20	Bind			76.586 4 m
1320	66	Faden		1.160 4 m
2640	132	2	Elle	580.2 mm

80.41.3 Units of Area

Before 1872

				Metric
Morgen				2585.334 067 m ²
1 $\frac{1}{2}$	Scheffelsaat or Scheffel Saatland			1723.556 045 m ²
120	80	Quadrat-Ruthe		21.544 451 m ²
30,720	20,480	256	Quadrat-Fuß	8.415 801 dm ²

80.41.4 Units of Volume

Some reported measures:

1 **Schachtruthe** (for stones, etc.) = 256 Kubik-Fuß = 6.250 045 m³;

1 **Klafter** (for timber) = 216 Kubik-Fuß = 5.273 476 m³;
1 **Fuder** (for coke) = 36 Balgen = 72 Kubik-Fuß = 1.757 825 m³;
1 **Bergfuder** (for hard coal) = 26 Balgen = 52 Kubik-Fuß = 1.269 540 m³;
1 **Balge** (for coke and hard coal) = 48.828 285 dm³.

80.41.5 Units of Dry Capacity

				Metric
Fuder				2373.789 6 L
12	Malter			197.815 8 L
72	6	Himten		32.969 3 L
288	24	4	Metzen	8.242 325 L

80.41.6 Units of Liquid Capacity

For wine and beer

				Metric
Oxhoft^a				205.079 605 L
6	Anker			34.179 934 L
168	28	Maß		1.220 712 L
672	112	4	Ort	305.178 mL

^aCalled **Driling** or **Drieling** when used for beer

For spirits and brandy

				Metric
Ohm or Driling				131.836 889
4	Anker			32.959 222 L
108		27	Maß	1.220 712 L

80.41.7 Units of Weight

For mercantile use before 1858

				Metric
Centner				46.771 1 kg
100	Pfund^a			467.711 g
3200	32	Loth		14.616 g
12,800	128	4	Quentchen	3.654 g

^aAfter 1858, 1 **Pfund** = 500 g

Money exchanger’s weights

				Metric
Vereinsmark				233.855 g
16	Loth			14.616 g
288	18	Gran		811.996 mg

Before 1872

								Metric
Meile								8803.476 480 m
1920	Ruthe							4.585 144 m
5120	2 ² / ₃	Klafter						1.719 429 m
15,360	8	3	Elle					573.143 mm
30,720	16	6	2	Fuß				286.571 mm
368,640	192	72	24	12	Palm			95.524 mm
1,474,560	768	288	96	48	4	Zoll		23.881 mm
11,796,480	6144	2304	768	384	32	8	Theil	2.985 mm

For medical use before 1872

						Metric
Pfund						350.783 g
12	Unze					29.232 g
96	8	Drachm				3.654 g
288	24	3	Skrupel			1.218 g
5760	480	60	20	Gran		60.90 mg

80.42 Schleswig-Holstein

The Duchy of Schleswig was Danish, under the name of Sønderjylland, while Holstein was a German fief and once a sovereign state. Both were, for several centuries, ruled by Denmark. The 1773 Treaty of Zarskoje Selo transferred Holstein to the Danes. Prussia annexed the territory in 1866. In 1920, the area was divided. North Schleswig became part of Denmark and South Schleswig and Holstein went to Germany.

Main sources: [BÖTT] and [MART3]

80.42.1 Currency

1788-1866: 1 Speciesthaler = 3 Mark =
 48 Schillinge species =
 60 Schillinge Kurant =
 120 Sechsling = 240 Dreiling

80.42.2 Units of Length

For surveying before 1872

				Metric
Rheinländische Fuß				313.853 mm
12	Zoll			26.154 mm
120	10	Linie		2.615 mm
1200	100	10	Theil	261.5 µm

Other reported measures:

1 Brabanter Elle = 691.410 mm.

80.42.3 Units of Area

Before 1872

				Metric
Steuertonne				5466.121 8 m ²
260	Quadratruthe			21.023 545 m ²
66,560	256	Quadratfuß		8.212 3 dm ²

Other reported measures:

1 Heilscheffel = 144 Quadratruten = 3027.39 m².

80.42.4 Units of Volume

For firewood before 1872

		Metric
Klafter		2.118 076 m ³
90	Kubik Fuß	23.534 dm ³

80.42.5 Units of Dry Capacity

Old system

						Metric
Drömt						~500 L
3	Tonne					~166.7 L
12	4	Scheffel				~41.7 L
48	16	4	Spint			~10.4 L
192	64	16	4	Kanne		~2.6 L
384	128	32	8	2	Kopp	~1.3 L

Before 1872

								Metric
Last								3338.909 778 L
24	Tonne							139.121 241 L
96	4	Himpten						34.121 241 L
192	8	2	Scheffel					17.390 156 L
384	16	4	2	Spint				8.695 078 L
768	32	8	4	2	Viertel or Kanne			4.347 539 L
1536	64	16	8	4	2	Achtel		2.173 769 L
3072	128	32	16	8	4	2	Sechzehntel	1.086 885 L

Other reported measures:

1 **Heilscheffel** (for wheat) = ~ 112.5 L;

80.42.6 Units of Liquid Capacity

Before 1872

										Metric
Fuder										869.460 000 L
4	Oxhoft									217.365 000 L
6	1½	Ohm								144.910 000 L
24	6	4	Anker							36.227 500 L
30	7½	5	1¼	Eimer						28.982 000 L
120	30	20	5	4	Viertel					7.245 500 L
240	60	40	10	8	2	Stübchen				3.622 750 L
480	120	80	20	16	4	2	Kanne			1.811 375 L
960	240	160	40	32	8	4	2	Quartier		905.687 mL
1920	480	320	80	64	16	8	4	2	Oessel	452.844 mL

80.42.7 Units of Weight

Before 1861

										Metric
Commerzlast										2908.246 800 kg
1⅓	Schiffslast									2423.539 000 kg
21⅔	17⅔	Schiffspfund								135.718 184 kg
42⅔	35⅔	2	Zuber							67.859 092 kg
53⅔	44⅔ ₁₄	2½	1¼	Centner						54.287 274 kg
300	250	14	7	5⅓	Rähmel^a					9.694 156 kg
428⅔	357⅔	20	10	8	1⅔	Liespfund				6.785 909 kg
6000	5000	280	140	112	20	14	Pfund			484.708 g
192,000	160,000	8960	4480	3584	640	448	32	Loth		15.147 g
768,000	640,000	35,840	17,920	14,336	2560	1792	128	4	Quentschen	3.787 g

^aFor flax

Between 1861 and 1872

					Metric
Centner					50 kg
100	Pfund				500 g
1000	10	Zehntelpfund			50 g
10,000	100	10	Quentin		5 g
100,000	1000	100	10	Tausendtel or Oertgen	500 mg

For medical use before 1872

				Metric
Medicinal Unze				300 g
8	Drachme			37.5 g
24	3	Skrupel		12.5 g
480	60	20	Gran	625 mg

Some other reported measures:

1 **Heilscheffel** (before 1866) = 72 – 86.2 kg.

80.43 Schwarzburg-Rudolstadt

In 1599, the two counties of Schwarzburg-Rudolstadt and Schwarzburg-Sondershausen were established. Schwarzburg-Rudolstadt became a Principality in 1711, a Free State in 1919, and merged into the state of Thuringia in 1920.

80.43.1 Currency

1841–1872: 1 Gulden = 60 Kreutzer = 240 Pfennig = 480 Heller
 –1841: 1 Thaler = 24 Groschen = 288 Pfennig

80.43.2 Units of Length

System used by the sovereignty (*Die Oberherrschaft*)

				Metric
Fuß				318 mm
12	Zoll			26.5 mm
144	12	Linie		2.208 mm

System used by ordinary people (*Die Unterherrschaft*)

				Metric
Fuß				565 mm
12	Zoll			47.08 mm
144	12	Linie		3.924 mm

In Rudolstadt before 1872

					Metric
Rute					4.515.20 m
2 $\frac{7}{11}$	Lachter				2.069 47 m
8	3 $\frac{3}{5}$	Elle			564.408 mm
16	7 $\frac{1}{3}$	2	Fuß		282.200 mm
192	88	24	12	Zoll	23.517 mm

Other reported measures:

1 **Elle** (for *Die Oberherrschaft*) = 624.1 mm;
 1 **Elle** (for *Die Unterherrschaft*) = 466.4 mm.

80.43.3 Units of Area

System used by the sovereignty (*Die Oberherrschaft*)

			Metric
Quadratfuß			10.112 4 dm ²
144	Quadratzoll		7.022 5 cm ²
20,736	144	Quadratlinie	4.875 mm ²

System used by ordinary people (*Die Unterherrschaft*)

			Metric
Quadratfuß			31.922 5 dm ²
144	Quadratzoll		22.165 26 cm ²
20,736	144	Quadratlinie	15.397 mm ²

In Rudolstadt

				Metric
Acker				3261.925 m ²
160	Quadratrute			20.387 031 m ²
40,960	256	Quadratfuß		7.963 68 dm ²

80.43.4 Units of Dry Capacity

System used by the sovereignty (*Die Oberherrschaft*)

					Metric
Scheffel					114.685 L
8	Achtel				14.335 6 L
16	2	Metzen			7.167 8 L
384	48	24	Nößel		298.659 mL

System used by ordinary people (*Die Unterherrschaft*)

				Metric
Scheffel				45.637 L
4	Viertel			11.409 25 L
8	2	Metzen		5.704 625 L
16	4	2	Nöbel	2.852 312 L

In Rudolstadt

				Metric
Scheffel				187.280 L
8	Achtel			23.41 L
16	2	Metze		11.705 L
385	48	24	Nöbel	487.708 mL

System used by ordinary people (*Die Unterherrschaft*)

		Metric
Eimer		68.486 L
72	Maß	951.194 mL

In Rudolstadt

			Metric
Eimer			60.170 L
72	Maß		835.694 mL
144	2	Nöbel	417.847 mL

80.43.5 Units of Liquid Capacity

System used by the sovereignty (*Die Oberherrschaft*)

		Metric
Eimer		59.882 L
72	Maß	831.694 mL

80.43.6 Units of Weight

In Rudolstadt before 1858

						Metric
Centner						51.393 540 kg
110	Pfund					467.214 g
3520	32	Loth				14.600 437 g
14,080	128	4	Quentchen			3.650 109 g
56,320	512	16	4	Pfennig		912.527 mg
112,640	1024	32	8	2	Heller	456.264 mg

Metric-linked system in Rudolstadt between 1859 and 1871

							Metric
Centner							50 kg
10	Stein						5 kg
100	10	Pfund					500 g
3000	300	30	Loth				16.667 g
30,000	3000	300	10	Quentchen			1.667 g
300,000	30,000	3000	100	10	Zent		166.667 mg
3,000,000	300,000	30,000	1000	100	10	Korn	16.667 mg

Some other reported measures:

100 L (for wheat) = 152 Pfund = about 76 kg;
 100 L (for rye) = 144 Pfund = about 72 kg;
 100 L (for barley) = 124 Pfund = about 62 kg;
 100 L (for oats) = 84 Pfund = about 42 kg.

80.44 Schwarzburg-Sondershausen

In 1599, the two counties of Schwarzburg-Rudolstadt and Schwarzburg-Sondershausen were established. In 1697, they became a Principality. In 1909, the territory became part of Schwarzburg-Rudolstadt, and merged into the state of Thuringia in 1920.

80.44.1 Units of Length

See also *Prussia*.

System used by the sovereignty (*Die Oberherrschaft*) in Arnstadt

						Metric
Ruthe						4.520 m
1½	Ruthe					3.955 m
2⅔	2⅔	Klafter				1.695 m
16	14	6	Fuß			282.50 mm
192	168	72	12	Zoll		23.542 mm
2304	2016	864	144	12	Linie	1.961 8 mm

System used by ordinary people (*Die Unterherrschaft*) in Sondershausen

			Metric
Werkfuß			287.62 mm
12	Zoll		23.968 mm
144	12	Linie	1.997 4 mm

System used by ordinary people (*Die Unterherrschaft*) in Sondershausen

		Metric
Ruthe		3.955 28 m
14	Vermessungsfuß	282.52 mm

80.44.2 Units of Area

Some reported measures:

1 **Acker** (used by the sovereignty (*Die Oberherrschaft*) in Arnstadt) = 160 Quadratruthen = 2502.7 m²;

1 **Acker** (used by ordinary people (*Die Unterherrschaft*) in Sondershausen) = 120 Quadratruthen = 1877.3 m²;

80.44.3 Units of Volume

Some reported measures:

1 **Klafter** = 144 Kubikfuß = 3.27 m³;
 1 **Klafter** = 126 Kubikfuß = 2.863 m³;
 1 **Malter** = 64 Kubikfuß = 1.45 m³.

80.44.4 Units of Dry Capacity

System used by ordinary people (*Die Unterherrschaft*) in Sondershausen

			Metric
Malter			727.12 L
16	Scheffel		45.445 L
64	4	Metze	11.361 L

Metric-linked system

			Metric
Melter or Sac			150 L
10	Viertel or Quarteron		15 L
100	10	Immi or Emine	1.5 L

80.44.5 Units of Liquid Capacity

System used by ordinary people (*Die Unterherrschaft*) in Sondershausen

			Metric
Kanne^a			1.984 L
2	Maß		992 mL
4	2	Nösel	496 mL

^a1 **Bierkanne** (for beer) = 1.804 L

Traditional system before 1858

			Metric
Eimer			61.83 L
36	Kanne		1.717 5 L
72	2	Maß	858.75 mL
144	4	2	Nösel 429.375 mL

Metric-linked system after 1858

			Metric
Saum, Ohm or Muid			150 L
4	Eimer, Setier or Brente		37.5 L
100	25	Maß or Pot	1.5 L
400	100	4	Schoppen 375 mL

80.44.6 Units of Weight

1 **Pfund** (used by ordinary people (*Die Unterherrschaft*) in Sondershausen) = 467.214 g or 467.711 g.

Other reported measures:

100 L (for wheat) = 155½ Pfund = about 77.75 kg;
 100 L (for rye) = 149 1/5 Pfund = about 74.6 kg;
 100 L (for barley) = 131 Pfund = about 65.5 kg;
 100 L (for oats) == 94.18 Pfund = about 47.09 kg.

80.45 Waldeck (-Pyrmont)

Waldeck was established as a County in 1180 and became a *Reichsgraf* in 1349. In 1625, it was

succeeded to Pyrmont, and from 1668 on, Waldeck and Pyrmont were permanently united. In 1712, the count was raised to the rank of prince. In 1805, Pyrmont became a separate principality, but was once again united with Waldeck in 1812. Waldeck-Pyrmont became a Free State in 1918, and submitted to Prussia in 1929. The area is now comprised of territories in present-day Hesse and Lower Saxony.

80.45.1 Currency

–1875: 1 Thaler = 30 Silbergroschen = 360 Pfennige

80.45.2 Units of Length

See *Hesse-Nassau*.

80.45.3 Units of Area

1 **Morgen** = 2553.22 m².

80.45.4 Units of Dry Capacity

			Metric
Malter			205.662 L
6	Himten		34.277 L
18	3	Dreilingsmetze	11.426 L

80.45.5 Units of Liquid Capacity

			Metric
Maß			1.424 L
2	Schoppen		712 mL
16	8	Glas	89 mL

80.46 Westphalia

The Kingdom of Westphalia included Hesse and some parts of Brunswick-Lüneburg, from 1807 to 1813.

80.46.1 **Currency**

1808–1813: 1 Westphalian frank =
 100 Centimen
1807–1813: 1 Westphalian thaler =
 36 Mariengroschen =
 288 Pfennig

dynasty fell to Württemberg-Mömpelgard, who took the Stuttgart title. Territories around Reutlingen and Heilbronn were added during the early nineteenth century, and Napoleon elevated the duke to king in 1806. It became the Free People’s State of Württemberg in 1918, but was divided after World War II into two new states: Württemberg-Baden and Württemberg-Hohenzollern. In 1952, these two states merged with Baden to become Baden-Württemberg.
Main source: [HIP2]

80.47 **Württemberg**

Württemberg became a County in 1135. The territory was divided into Württemberg-Urach and Württemberg-Stuttgart in 1441. In 1473, a cadet line of the family was established in Mömpelgard. Württemberg-Urach was raised to the status of a Duchy in 1495, but that line died off in 1496 and the area was annexed to Württemberg-Stuttgart. When the Württemberg-Stuttgart line died off in 1593, the primacy of the

80.47.1 **Currency**

1824–1873: 1 Württemberg gulden =
 60 Kreuzer

80.47.2 **Units of Length**

Before 1806

						Metric
Meile						7.448 041 481 km
~1582	Große Ruthe					4.707 802 m
–	1¼	Kleine Ruthe				3.766 242 m
–	15	12	Fuß			313.853 46 mm
–	180	144	12	Zoll		26.154 455 mm
–	2160	1728	144	12	Linie	2.179 538 mm

After 1806

								Metric
Meile								7.448.747 8 km
2600	Ruthe							2.864 903 m
4333⅓	1⅔	Klafter						1.718 94 m
–	–	2.798 5...	Elle					614.235 mm
26,000	10	6	2.144. ...	Württembergischer Fuß				286.49 mm
260,000	100	60	–	10	Zoll			28.649 mm
2,600,000	1000	600	–	100	10	Linie		2.864 9 mm
26,000,000	10,000	6000	–	1000	100	10	Punkt	286.49 µm

80.47.3 Units of Area

						Metric
Juckert						4727.94 m ²
1½	Morgen					3151.96 m ²
6	4	Viertelmorgen				787.989 6 m ²
12	8	2	Achtmorgen			393.994 8 m ²
576	384	96	48	Quadratruthe		8.208 225 m ²
57,600	38,400	9600	4800	100	Quadratschuh	8.208 225 dm ²

80.47.4 Units of Volume

For hay and straw

		Metric
Foundre		1.76 m ³
80	Bund	22 dm ³

Other reported measures:

- 1 **Achtel** (for timber) = 1/8 Messklafter = 18 Kubikfuss.

80.47.5 Units of Dry Capacity

Scale used between 1806 and 1871

							Metric
Scheffel							177.226 L
8	Simri						22.153 25 L
32	4	Vierling or Viertel					5.538 31 L
64	8	2	Achtel				2.769 16 L
128	16	4	2	Mässlein			1.384 58 L
256	32	8	4	2	Ecklein		692.289 mL
1024	128	32	16	8	4	Viertelein	173.072 mL

Other reported measures:

- 1 **Achtel** (for lime) = 4 Imi or Immi = 40 Maass = 73.482 L;
 1 **Wanne** (for hay) = 512 Kubikfuß = 1100 Pfund;
 1 **Halbe Wanne** (for hay) = 216 Kubikfuß;
 1 **Viertelwanne** (for hay) = 128 Kubikfuß.

80.47.6 Units of Liquid Capacity

For old wine, spirits and milk; for turbid wine and must; both scales used from 1806 to 1871

				Metric	Metric
Fuder				1763.562 L	1840.719 L
6	Eimer			293.927 L	306.786 5 L
96	16	Imi		18.370 L	19.155 L
960	160	10	Maß	1.837 L	1.915 L

For beer between 1806 and 1871

				Metric
Fuder				1603.239 L
6	Schenkeimer			267.206 5 L
60	10	Maß		26.720 65 L
240	40	4	Schoppen or Quart	6.680 162 L

80.47.7 Units of Weight

Metric-linked system before 1872

					Metric
Centner					50 kg
100	Pfund				500 g
3200	32	Loth			15.625 g
12,800	128	4	Quentchen		3.906 25 g
51,200	512	16	4	Richtpfennig	976.562 5 mg

81 Ghana [Formerly: Gold Coast]

See also *Asanteman* and *Togoland*.

In 1957, the Gold Coast and British Togoland were merged to form the independent country of Ghana.

The metric system has been official since 1972, and compulsory since 1975.

Main sources: [BOWD], [BRAC2], [FORI], [GARR], [MARE], [MART3], [MENZ], [MÜLL], [NIAN2], and [RATT]

81.1 Currency

1972–:	1 Ghanaian cedi = 100 pesewas
1967–1972:	1 new Ghanaian cedi = 100 new pesewas
1965–1967:	1 Ghanaian cedi = 100 pesewas
1958–1965:	1 Ghanaian pound = 20 shillings = 240 pence
1912–1957:	1 British West African pound = 20 shillings = 240 pence
1874–1912:	1 British pound sterling = 20 shillings = 240 pence = 960 farthings
–1874:	1 ounce = 16 ackeys 1 Spanish piastre = 10 macutas = 100 cents

81.2 Units of Length

British Imperial-linked system

			Metric
jackutan			3.657 567 m
6½	condu or pic		577.511 mm
12	1 ¹⁷ / ₁₉	foot	304.797 mm

81.3 Units of Capacity

Both liquids and dry commodities were sold by weight.

81.4 Units of Weight

Traditional upper scale

				Metric
pareguab				717.40 g
2	pereguan-num			358.7 g
5	2½	ntanu		143.48
10	5	2	pereguan	71.74 g

Traditional middle scale

			Metric
asuanu			35.6 g
2		osua	17.8 g

Traditional lower scale

					Metric
nsuansa					4.48 g
2	nsuansa				2.24 g
4	2	nsoansafa			1.12 g
16	8	4	ntaku-anum		280 mg
32	16	8	2	kokwa^a	140 mg

^aIt is equal to the weight of a grain from *abrus precatorius*

For gold during the late nineteenth century, based on [MART3]

				Metric
benda				64.120 g
2	benda-offa			32.060 g
4	2	engebba		16.030 g
8	4	2	piso or ensanno	8.015 g

For rubber, based on [MART3]

		Metric
cantar		978.852 928 kg
5	gamelle	195.770 586 kg

Upper scale for gold, as reported in 1929, based on [RATT]

								Metric
pereguab								717.40 g
2	peregwab num							358.70 g
$4\frac{1}{20}$	$2\frac{1}{40}$	ntanu asoanu						177.20 g
5	$2\frac{1}{2}$	—	ntanu					143.48 g
10	5	—	2	pereguan				71.74 g
$13\frac{2}{5}$	$6\frac{7}{10}$	—	—	—	asuasan			53.40 g
$20\frac{3}{20}$	$10\frac{3}{40}$	—	—	—	$1\frac{1}{2}$	asuaniu		35.60 g
$40\frac{3}{10}$	$20\frac{3}{20}$	—	—	—	$1\frac{1}{3}$	2	osua	17.80 g

Lower scale for gold, as reported in 1929, based on [RATT]

							Metric
osua							17.80 g
$2\frac{1}{44}$	suru						8.80 g
—	—	nsuansa					4.48 g
—	—	2	nsoansafan				2.24 g
$15\frac{25}{28}$	—	4	2	ntaku anum			1.12 g
$63\frac{4}{7}$	$31\frac{267}{623}$	16	8	4	kokwa mienu		280 mg
$127\frac{1}{7}$	$62\frac{534}{623}$	32	16	8	2	kokwa	140 mg

For gold at Nzima, based on [NIAN2]

								Metric
béna								c. 64 g
2	alagnon							c. 32 g
4	2	alan						c. 16 g
8	4	2	simalé					c. 8 g
16	8	4	2	ejuratchui				c. 4 g
32	16	8	4	2	mètèba			c. 2 g
64	32	16	8	4	2	takunzien		c. 1 g
128	64	32	16	8	4	2	kpèsèba	c. 500 mg
384	192	96	48	24	12	6	3	taku c. 167 mg

82 Ghana Empire [also Wagadou Empire]

See also *Mauritania* and *Mali Empire*.

This Empire, located in present-day south-eastern Mauritania and Western Mali, existed from c. 830 until c. 1235, when it was subsumed by the Mali Empire.

The demand for gold during the tenth century brought the Muslim system of weights through the Sahara to the Tegdaoust area (present-day Aoudaghost). Glass weights, found during excavations conducted between 1960 and 1976, are likely the remnants of this gold trade.

Main sources: [DEV12], [MAUN], and [ROBE3]

82.1 Units of Weight

Various glass weights, from the twelfth to fourteenth centuries, have been found at Koumbi Saleh (probably the capital of the Ghana Empire) during excavations conducted between 1949 and 1951. These have been considered to weigh 7.8 g, 6.54 g, 4.10 g, 2.43 g, and 0.65 g. Some glass weights were also found at Gao (the capital of the medieval Gao Empire, in present-day Mali), weighing 5.77 g and 10.12 g. Other materials used to manufacture weights were copper, iron and stone. From the same period, at Koumbi Saleh, weights were found that weigh 20.42 g (iron), 20.24 g (iron), 14.4 g (copper), and 14.85 g (stone).

83 Gibraltar

Moslems took control of this Peninsula from Spain and fortified it in 711. Spain retook it in 1309, but lost it to the Moors in 1333. The Peninsula once again came into Spanish hands in 1493, when the Moors were driven out of Spain definitively. Gibraltar was officially declared a British possession in 1704. It became a British crown colony in 1830. In 1967, Gibraltar voted in favor of remaining under British rule, and it has had general internal autonomy since 1969.

The metric system has been compulsory since 1970.

Main sources: [BAUE], [DOUR], and [MART3]

83.1 Currency

- 1971–: 1 Gibraltar pound = 100 pence
- 1889–1895: 1 Spanish peseta = 100 centimos
- 1842–1971: 1 Gibraltar pound = 20 shillings = 240 pence
- 1838–1971: 1 pound sterling = 20 shillings = 240 pence = 960 farthings
- ?–1838: 1 Gibraltar dollar or cob = 12 reales = 192 cuartos
- ?: 1 Gibraltar courant pjaster = 8 reales = 128 cuartos

83.2 Units of Length

1 pied = 278.33 mm.

83.3 Units of Dry Capacity

Some reported measures:

1 **fanega** (for corn) = $2\frac{1}{16}$ Winchester bushel = 72.676 L;

1 **fanega** (for wheat) = $1\frac{1}{5}$ Winchester bushel = 56.379 L.

83.4 Units of Liquid Capacity

Some reported measures:

1 **gallon** (for wine) = 4.141 L;

1 **pipe** (for wine) = 116 old English Wine gallons = 439.18 L;

1 **arroba** (for oil) = $3\frac{1}{2}$ old English Wine gallons = 12.62 L, or 26 lbs = 11.793 409 kg.

83.5 Units of Weight

Some measures reported during the nineteenth century:

1 **barrel** (for wheat flour) = 196 lbs = 88.904 160 kg;

1 **quintal** (for sugar from Brazil) = 58.752 kg;

1 **fanega** (for peas) = 122 lbs = 55.338 304 kg;

1 **fanega** (for corn) = 118 lbs = 53.523 933 kg;

1 **fanega** (for beans) = 113 lbs = 51.256 kg;

1 **hundredweight** (for tobacco) = 112 lbs = 50.802 377 kg;

1 **quintal** (for almonds) = 100 libbras di Castiglia = 46.009 300 kg;

1 **livre** (Spanish) = 16 onces = 461.5 g;

1 **livre** (British) = 16 onces = 433.55 g.

84 Gilbert and Ellice Islands

See *Kiribati*.

85 Glorioso Islands or Glorieuses

Glorieuses is an archipelago that became a French possession in 1892. Both Madagascar and Seychelles claim the islands.

86 Kingdom of Golkonda (c. 1364–1512)

See *India*.

87 Gold Coast

See *Ghana*.

88 Golden Horde

See also *Ottoman Empire* and *Russia*.

The Golden Horde Empire was a Tatar-Mongolian empire in eastern Europe and western Asia, centered on the lower Volga. It was one of the four kingdoms that were created when Genghis Khan's empire was divided some years after his death. From the late 1400s, the Moscow Principality began to increase its power under the reign of Ivan the Great. By 1502, the Golden Horde no longer existed.

88.1 Units of Weight

1 **som** (for silver) = ~ 140 g.

89 Gorizia and Gradisca

See also *Austrian Littoral*, *Italy* and *Slovenia*.

The County of Gorizia became part of the Habsburg domains in 1500. In 1754, Gradisca was unified with Gorizia and named the County of Gorizia and Gradisca. After the Napoleonic War, the county was split between Italy and

Austria. In 1813, the county was re-established. In 1816, it was included in the Kingdom of Illyria. In 1861, the territory gained autonomy as the Princely County of Gorizia and Gradisca, within the Austia-Hungarian Empire. In 1918, the county was abolished and incorporated into the region of Julian March.

The metric system has been compulsory since the early twentieth century.

89.1 Units of Liquid Capacity

Before 1857

			Metric
barilla			66.020 5 L
14	scuddela		4.715 75 L
36	2 ² / ₇	boccale	1.833 902 8 L

After 1857

		Metric
conza		84.883 5 L
1 ² / ₇	barilla	66.020 496 L

89.2 Units of Weight

After 1856

			Metric
Meiler or migliajo			560.063 kg
10	Zentner or centinajo		56.006 3 kg
1000	100	Pfund or funto	560.063 g

						Metric
legua ^a						5553.33 m
6666 ² / ₃	vara					833 mm
20,000	3	pié				277.67 mm
26, 666 ² / ₃	4	1 ¹ / ₃	palmo			208.25 mm
240,000	36	12	9	pulgada		23.139 mm
320,000	48	16	12	1 ¹ / ₃	dedo	17.354 mm

^aThere was also the **legua castellana** = 6666²/₃ varas castellanas = 5572.70 m

90 Kingdom of Goryeo

See *Korea*.

91 Gozo

See *Malta*.

92 Kingdom of Granada

See also *Crown of Castile* and *Spain*.

The Kingdom of Granada was a territorial jurisdiction of the Crown of Castile from the conclusion of the *Reconquista* in 1492 until 1700, when Spain came under the rule of the major branch of the Habsburg dynasty.

92.1 Province of Almería

92.1.1 Units of Length

92.1.2 Units of Area

Castilian scale

					Metric
fanega de castellanas					6439.561 75 m ²
5 ¹⁹ / ₂₅	tahulla				1117.979 47 m ²
576	100	estadal			11.179 8 m ²
9216	1600	16	vara cuadrada castellanas		69.873 7 dm ²
82,944	14,400	144	9	pié cuadrada castellanas	7.763 7 dm ²

Traditional system

			Metric
vara cuadrada			69.388 9 dm ²
9	pie cuadrada		7.709 9 dm ²
1296	144	pulgada cuadrada	5.354 cm ²

92.1.3 Units of Volume

1 vara cúbica = 578.009 537 dm³.

92.1.4 Units of Dry Capacity

						Metric
cahiz						660.74 L
12	fanega					55.062 L
24	2	media fanega				27.531 L
144	12	6	celemin			4.588 L
576	48	24	4	cuartille		1.147 L
2304	192	96	16	4	ochave	286.78 mL

92.1.5 Units of Liquid Capacity

				Metric
arroba				16.36 L
8	azumbre			2.045 L
32	4	cuartille		511.25 mL
128	16	4	copa	127.812 5 mL

92.2 Province of Granada

92.2.1 Units of Length

For surveying

		Metric
habi		21.616 m
40	ad-dira ar aššašiyya	540.4 mm

92.2.2 Units of Dry Capacity

						Metric
cahiz						656.40 L
12	fanega					54.700 L
48	4	cuartilla				13.675 L
144	12	3	celemin			4.558 333 L
576	48	12	4	cuartillo		1.139 583 L
2304	192	48	16	4	ochavillo	284.896 mL

92.2.3 Units of Liquid Capacity

For wine

				Metric
tomolo				939.60 L
1½	botte			626.40 L
60	40	arroba		15.660 L
540	360	9	azumbre or sombre	1.74 L

For general use, based on [MART3]

		Metric
arroba		16.420 L
38	cuartillo	432.105 mL

92.2.4 Units of Weight

Castilian scale

							Metric
tonelada							920.186 kg
20	quintal						46.009 3 kg
80	4	arroba					11.502 325 kg
2000	100	25	libra				460.093 g
4000	200	50	2	marco			230.046 5 g
32,000	1600	400	16	8	onza		28.755 8 g
512,000	25,600	6400	256	128	16	adarme	1.797 g

92.3 Province of Málaga

92.3.1 Units of Length

Upper Burgos scale

						Metric
legua						6687.240 000 m
969 ²³ / ₂₃	cuerda					6.896 216 m
2000	2 ⁷ / ₁₆	estadal				3.343 620 m
4000	4 ¹ / ₆	2	braza			1.671 810 m
4800	4 ¹⁹ / ₂₀	2 ² / ₅	1 ¹ / ₅	paso		1.393 175 m
8000	8 ³ / ₄	4	2	1 ² / ₃	vara de Burgos	835.905 mm

Lower Burgos scale

											Metric
vara de Burgos											835.905 mm
2	codo										417.952 mm
3	1½	píe									278.635 mm
4	2	1⅓	palmo								208.976 mm
6	3	2	1½	geme							139.317 mm
8	4	2⅔	2	1⅓	colo						104.488 mm
12	6	4	3	2	1½	palmo de ribera					69.659 mm
36	18	12	9	6	4½	3	pulgada				23.220 mm
48	72	16	12	8	6	4	1⅓	dedo			17.415 mm
432	648	144	108	72	54	36	12	9	linea		1.935 mm
5184	7776	1728	1296	864	648	432	144	108	12	punto	161 µm

92.3.2 Units of Area

					Metric
fanega					6037.089 1 m ²
2	media fanega				3018.544 5 m ²
540	270	estadal			11.179 8 m ²
8640	4320	16	vara cuadrada		69.873 7 dm ²
77,760	38,880	144	9	píe cuadrada	7.763 4 dm ²

92.3.3 Units of Dry Capacity

					Metric
cahiz					647.280 000 L
12	fanega				53.940 000 L
144	12	almud or celemín			4.495 000 L
576	48	4	cuartillo		1.123 750 L
2304	192	16	4	ochavo or racion	280.937 5 mL

92.3.4 Units of Liquid Capacity

						Metric
bota						891.310 000 L
1 ^{117/204}	pipa					566.440 000 L
1 ^{4/60}	1⅔ ₁₅	bota				499.800 000 L
53½	34	30	arroba or cántara			16.660 000 L
428	272	240	8	azumbre		2.082 500 L
1712	1088	960	32	4	cuartillo	520.625 mL

92.3.5 Units of Weight

										Metric
lastre										4048.817 520 kg
2	tonelada									2024.408 760 kg
50 $\frac{3}{7}$	25 $\frac{3}{7}$	carga								80.516 257 kg
88	44	1 $\frac{3}{4}$	quintal							46.009 290 kg
169 $\frac{3}{13}$	84 $\frac{3}{13}$	3 $\frac{19}{52}$	1 $\frac{17}{13}$	baril						23.924 831 kg
352	176	7	4	2 $\frac{25}{25}$	arroba					11.502 322 5 kg
8800	4400	175	100	52	25	libra				460.092 900 g
35,200	17,600	700	400	208	100	4	cuarteron			115.023 225 g
140,800	70,400	2800	1600	832	400	16	4	onza		28.755 806 g
1,126,400	563,200	22,400	12,800	6656	3200	128	32	8	ochava	3.594 476 g

93 Greece

See also *Samoa* and *Ottoman Empire*.

Greece was part of the Ottoman Empire from around 1428 until 1822, when it gained its independence. The various archipelagos and islands around Greece itself have become parts of Greece at different times. For example, the Ionian Islands became part of Greece in 1862, Crete in 1913, the Aegean Islands (Chios, Icaria, Lemnos, Mytilene and Samos) in 1923 and the Dodecanese Islands in 1947.

The metric system has been legally optional since September 28, 1836 and compulsory since 1922 and 1959.

93.1 Currency

2001–: 1 euro = 100 euro-cent
 1832–2002: 1 Greek drachma = 100 lepta

Metric-linked system after 1836

						Metric
schinis						10,000 m
10	stadion					1000 m
10,000	1000	(royal) piki				1 m
100,000	10,000	10	palamo			100 mm
1,000,000	100,000	100	10	daktyl		10 mm
10,000,000	1,000,000	1000	100	10	chiliostometron or gram	1 mm

1828–1833: 1 Greek phoenix = 100 lepta
 –1828: 1 Ottoman piaster or kuruş =
 40 para = 120 akçe

93.2 Units of Length

Some old measures:

1 **stadion** = 184.184 m;
 1 **piki** (for masonry and surveying) = 750 mm;
 1 large **piki** (Constantinople scale, for linn, cotton and wool) = 669 mm;
 1 **piki** (in Patras) = 685.998 mm (for linen and wool) and 635.241 mm (for silk);
 1 **endáseh** or small **piki** (Constantinople scale) = 648 mm;
 1 **piki** (in Euboea) = 616.292 mm;
 1 **piki** (in Mystras) = 457.257 mm;
 1 **Samian-Ionian foot** = 347.7 mm.

93.3 Units of Area

Old measure:

1 **stremma** (at Morea) = 3025 square piki =
1270.21 m².

Metric-linked system after 1836

					Metric
stremma ^a					1000 m ²
1000	square piki				1 m ²
100,000	100	square palamo			1 dm ²
10,000,000	10,000	100	square daktyl		1 cm ²
1,000,000,000	1,000,000	10,000	100	square chiliostometron	1 mm ²

^a1 **stremma** (at Nauoussa during the early twentieth century) = 1600 m²

93.4 Units of Dry Capacity

Cereals and butter were usually sold by weight.

Venetian scale for wheat and other cereals

				Metric	Metric
moggio				253.268 80 L	196.48 kg
4	staio or staro			83.317 20 L	49.12 kg
8	2	bacile		41.658 60 L	34.56 kg
216	54	27	oka	1.542 91 L	909.63 g

Other old measures reported during the nineteenth century:

1 **kiló** (for wheat) = 33.160 L.

93.5 Units of Capacity

Oil and wine were generally sold by weight.

Venetian scale

		Metric
barilla ^a		64.385 904 L
24	boccale or bozza	2.682 746 L

^aVaried by location in Greece. Also reported as 74.236 L and as 48 L

For oil (usually sold by weight)

			Metric
barilla			61.440 kg
19 ¹ / ₃	oka		3.178 kg
48	2 ¹ / ₂	ordinary oka ^a	1.271 kg

^aAs a measure of capacity, also reported as 1.333 to 1.340 L

Other reported measures during the nineteenth century:

1 **gallon** (for liquid fuel) = 4.546 L.

Metric-linked system after 1836

					Metric
kiló					100 L
100	litra				1 L
1000	10	kotylo			100 mL
10,000	100	10	mistrion		10 mL
100,000	1000	100	10	kubu	1 mL

93.6 Units of Weight

Metric-linked system during the early nineteenth century

								Metric
talanton								153.600 kg
$2\frac{9}{11}$	kantáro							56.320 kg
3	$1\frac{1}{10}$	stater						51.200 kg
$13\frac{3}{5}$	$4\frac{1}{2}$	$4\frac{1}{2}$	pinaki					11.520 kg
48	$17\frac{3}{5}$	16	$3\frac{3}{5}$	potsa				3.200 kg
100	$36\frac{2}{3}$	$33\frac{1}{3}$	$7\frac{1}{2}$	$2\frac{1}{12}$	mina			1.536 kg
120	44	40	9	$2\frac{1}{2}$	$1\frac{1}{5}$	oka ^a		1.280 kg
300	110	100	$22\frac{1}{2}$	$6\frac{1}{4}$	3	$2\frac{1}{2}$	pound	512.0 g
48,000	17,600	16,000	3600	1000	480	400	160	dramme 3.20 g

^aVaried by location between 1.250 and 1.333 kg

For grapes from Corinth

		Metric
millar		476.999 kg
1000	libbra grossa	476.999 g

Metric-linked system after 1836

								Metric
tono								1500 kg
10	talanton							150 kg
$26\frac{2}{3}$	$2\frac{2}{3}$	kantáro						56.25 kg
1000	100	$37\frac{1}{2}$	mna or mine (royal)					1.5 kg
1200	120	45	$1\frac{1}{5}$	oka				1.25 kg
3750	375	$140\frac{1}{8}$	$3\frac{3}{4}$	$3\frac{3}{8}$	livre (Venetian)			400 g
1,500,000	150,000	56,250	1500	1250	400	dramion		1 g
15,000,000	1,500,000	562,500	15,000	12,500	4000	10	obole	100 mg
150,000,000	15,000,000	5,625,000	150,000	125,000	40,000	100	10	cocco 10 mg

In Preceza

		Metric
cartoutso		481 g
150	dirhem	3.207 g

For medical use

		δραχμή			Metric
pond					360 g
12	unse				30 g
96	8	drachma			3.75 g
288	24	3	skrupel		1.25 g
5760	480	60	20	gran	62.5 mg

94 Greenland

See also *Denmark* and *Norway*.

The first people to set foot in Greenland arrived there around about 2500 BCE from Canada. Since then, six different Inuit cultures have immigrated in several waves up until the early ninth century CE. In 875, the Iclander Gunbjörn saw rocks on the East Coast of Greenland from his ship and returned to Iceland, where his observations were eventually, and posthumously, referred to as Gunbjörnsskär. In 982, Erik the Red arrived in Greenland, and the first settlement was established a few years later. Greenland was a Free State until 1261, when the sovereignty of Norway was extended to the island. Since the Greenland Norse medieval community had become abandoned c. 1450, there was no claim until Danish-Norwegian rule was reestablished in 1721. From the late seventeenth century until the late eighteenth century, it was primarily the European whalers who came into contact with the Inuits. This contact resulted in extensive trade, and various small glass beads and corals came to be used as monetary units. In 1921, Denmark extended its claim to include the entire island, and made it a colony of the crown in 1924. Greenland became part of the Kingdom of Denmark in 1953, and gained Home Rule in 1979.

The Artic hunters usually measured linear distances, small amounts of liquids and dry commodities, weights and time. In the ancient hunting society, units of measurement for area and volume were unimportant. Temperature could be appreciated adequately by perceptual judgment, especially since the person needing the information was present in the situation. Both Norwegian and Danish premetric units of weights and measures have been in use at some time. The metric system has now been in use since the early twentieth century. The main and official language among the Arctic Inuit people in Greenland is Kalaallisut. Below, the traditional units of measurent have been written in West Greenlandic Kalaallisut.

Main sources: [BERT2], [CHRI2], [GENE], [GULL], [GULL2], [MART3], [NANS], [PETE2], [ROSS3], [STEI3], and [THAL]

e-mail sources: [eFRAN], [eGULL], [eKJÆR], and [eMØLL]

94.1 Currency

- 1875–: 1 Danish krone = 100 øre or aurar
 - 1873–1875: 1 Danish krone = 2 daler rigsmønt
 - 1854–1874: 1 Danish daler rigsmønt = 96 skilling rigsmønt
 - 1813–1854: 1 Danish rigsbankdaler = 96 rigsbankskilling courant
 - 1713–1813: 1 Danish rigsdaler courant = 6 marck = 96 skilling courant
- As trading in hunting societies is deeply embedded in face to face social interactions, usually between family members and others in close personal relations, there was traditionally no need for abstract monetary values of goods exchanged.
- 1680s–1720s: European currency: glass beads, iron wares and different kinds of fabric
 - Native currency: skins from caribou, seals and foxes, soap stone products and baleen

94.2 Units of Length

Shorter linear distances were traditionally based on dimensions of body parts. Time was used for assessing the distance travelled, e.g., ‘four sleeps’ referred to a distance that required four sleeping breaks, a method that is sensitive to the mode of travel, weather, terrain, and other aspects of covering the distance.

Shorter distances, with proposed magnitudes

			Metric
isanneq ^a			~1.7 m
24	assak ^b		~72 mm
96	4	inuak ^c	~18 mm

^aThe distance between extended arms

^bThe breadth of a hand

^cThe breadth of a single finger

Dano-Norwegian scale during the early eighteenth century

					Metric
isanneq or favn					1.713 m
3	alen				571 mm
6	2	fisk			285.5 mm
12	4	2	pund		142.75 mm
24	8	4	2	assak	71.375 mm

Other reported measures:

1 **eqinneq** = the circle formed by touching the fingertips and thumb when gripping a paddle;

1 **sømile** = 1852 m.

Metric scale since the late nineteenth century

						Metric
tonkilometeri						1,000,000 m
1000	kilometeri					1000 m
1,000,000	1000	meteri				1 m
10,000,000	10,000	10	decimeteri			100 mm
100,000,000	100,000	100	10	centimeteri		10 mm
1,000,000,000	1,000,000	1000	100	10	milimeteri	1 mm

94.3 Units of Area

Metric scale since the late nineteenth century

					Metric
kvadratmeteri					1 m ²
100	kvadratdecimeteri				1 dm ²
10,000	100	kvadratcentimeteri			1 cm ²
1,000,000	10,000	100	kvadratmilimeteri		1 mm ²

94.4 Units of Capacity

Smaller amounts of water, salt, etc., were referred to as ‘containersful’ or ‘handsful.’

Traditional measure:

1 **eqisimiao** = a handful.

For lard, whale oil, and fish oil after 1782, based on [MART3] and [eFRAN]

					Metric
balje					175.189 711 L
1⅓	tønde				131.392 283 L
10⅔	8	skæppe or otting			16.424 035 L
85⅓	64	8	ottingkar		2.053 004 L
160	120	15	1⅔	pot	1.094 936 L

For lard, whale oil, and fish oil in North Greenland Inspectorate after 1790, based on [MART3] and [eFRAN]

					Metric
balje					197.088 425 L
1½	tønde				131.392 283 L
12	8	skøppe or otting			16.424 035 L
96	64	8	ottingkar		2.053 004 L
180	120	15	1%	pot	1.094 936 L

Other reported measures:

1 **anker** (for liquids from Denmark) = 37.437
072 L.

Metric scale after 1907

					Metric
hektoliteri					100 L
100	literi				1 L
1000	10	deciliteri			100 mL
10,000	100	10	centiliteri		10 mL
100,000	1000	100	10	mililiteri	1 mL

94.5 Units of Weight

Weight was traditionally given in comparison with naturally occurring entities, such as stones and rocks.

West Norwegian scale during the fourteenth century, based on [GAD] and [STEI3]

				Metric
læst				1481.380 kg
12	skippund			123.448 kg
288	24	lispund		5.144 kg
6912	576	24	mark	214.32 g

For walrus teeth and other dry commodities before 1868, based on [MART3] and [eFRAN]

			Metric
lispund			7.968 5 kg
16	pund		498.03 g
512	32	lod	15.56 g

For walrus teeth and other dry commodities after 1868, based on [MART3] and [eFRAN]

			Metric
centner			50 kg
100	pund		500 g
10,000	100	kvint	5 g

Metric scale after 1907

				Metric
tonsi				1000 kg
1000	kiilu			1 kg
1,000,000	1000	grammi		1 g
1,000,000,000	1,000,000	1000	miligrammi	1 mg

95 Grenada [Formerly: Concepcion]

Grenada was discovered in 1498 by Christopher Columbus, who named the island Concepcion. Grenada was a French colony from 1672 until 1763, when it was captured by the British. The French retook Grenada in 1779, but the Treaty of Versailles formally recognized British sovereignty over the island in 1783. Grenada was part of the Windward Islands from 1833 until 1885, and part of the Federation of the West Indies from 1958 until 1962. It became an associated state of Britain in 1964, and gained its independence in 1974.

The metric system is compulsory.

95.1 Currency

1973–:	1 US dollar = 100 cents
1965–1973:	1 East Caribbean dollar = 100 cents
1950–1964:	1 British East Caribbean dollar = 100 cents
1935–1950:	1 British West Indies dollar = 100 cents
1840–1935:	1 pound sterling = 20 shillings = 240 pence = 960 farthings

96 Guadeloupe

See also *French West Indies*.

Guadeloupe was discovered by Christopher Columbus in 1493. It became a French Colony in 1635, when two Frenchmen, L'Olive and Duplessis, took possession in the name of the French Company of the Islands of America. When repeated efforts by private companies to colonize the island failed, it was relinquished to the French crown in 1674, and established as a dependency of Martinique. It was occupied by the British on two occasions, 1759–63 and 1810–15, but was returned to France in 1816 and became an overseas department of France in 1946. In 2007, Saint Martin and Saint-Barthélemy were detached from Guadeloupe and became two separate French overseas collectivities.

Traditional measures were influenced by the weights and measures used in Tunis. During the seventeenth to nineteenth centuries, many measures were adopted from the system of weights and measures used in Paris. The metric system has been official since 1844.

Main sources: [DOUR], [KELL], [MART3], [MORE2], [RICA], and [STAT1922]

96.1 Currency

1999–:	1 euro = 100 euro-cents
1820–2002:	1 French franc = 100 centimes
1817–1826:	1 French livre colonial = 20 sous = 240 deniers

96.2 Units of Length

At Basse-Terre and Pointe-à-Pitre

		Metric
aune		1.191 076 m
44	pouce de Paris	27.069 9 mm

96.3 Units of Area

		Metric
carré		12.926.28 m ²
10,000	pas carré	1.292 628 m ²

96.4 Units of Dry Capacity

In general, dry commodities such as bananas, cotton, coffee, cacao, sugar cane and tobacco were sold by weight.

British Imperial-linked system for corn

			Imperial	Metric
kaffis			16 bu	581.90 L
16	whiba		1 bu	36.37 L
192	12	sah	1/12 bu	3.03 L

For legumes at Pointe-à-Pitre

			Metric
baril			96.857 394 L
4	fréquin		24.214 348 L
52	13	pot	1.862 642 L

96.5 Units of Liquid Capacity

At Basse-Terre and Pointe-à-Pitre

											Metric	
boucaout ^a											424.681 090 L	
–	baril ^b										409.780 030 L	
–	–	boucaout ^c									391.153 665 L	
–	–	–	tierçon ^c								242.142 745 L	
–	–	1 ¹⁷ / ₂₀	1 ³ / ₁₀	barrique							186.263 650 L	
	4	3 ⁴ / ₁₁	2 ⁴ / ₁₁	1 ⁴ / ₁₁	fréquin ^b						102.445 007 L	
114	110	105	65	50	27½	gallon					3.725 273 L	
228	220	210	130	100	55	2	pot				1.862 636 L	
456	440	420	260	200	110	4	2	pinte			931.318 mL	
912	880	840	520	400	220	8	4	2	chopine		465.659 mL	
1824	1760	1680	1040	800	440	16	8	4	2	roquille	232.829 mL	
3648	3520	3360	2080	1600	880	32	16	8	4	2	muce	116.415 mL

^aFor rum
^bFor wine and brandy
^cFor syrup

Scale based on [DOUR]

		Metric
pot		1.892 6 L
2	pinte	946.3 mL

96.6 Units of Weight

At Basse-Terre and Pointe-à-Pitre

				Metric
tonneau de mer ^a				979.011 694 kg
2	barrique ^b			489.505 847 kg
11 ¹ / ₂	5 ¹ / ₂	baril ^c		88.111 052 kg
2000	1000	180	livre or poids de marc	489.505 847 g

^aUsed for sea cargo
^bUsed for sugar
^cUsed for flour

97 Guam

Guam was a Spanish colony from 1521 until 1898, when it was surrendered to the United States as an unincorporated territory. The Japanese occupied Guam from 1941 until 1944.

The metric system has been compulsory since the early twentieth century.

97.1 Currency

- 1898–: 1 US dollar = 100 cents
1868–1898: 1 Spanish peseta = 100 centimos

98 Guastalla

See also *Emilia-Romagna* (sub-heading of *Italy*).

This area became a County from 1406 and a Duchy from 1621. In 1746, it became part of the Austrian Empire. It was revived as an independent principality for a few months in 1806. The area has been part of Italy since 1861.

The premetric systems of weights and measures were influenced by the old Spanish systems and the US customary systems. The metric system has been official since 1910 and compulsory since 1912.

Main sources: [AGHG], [BAUE], [BRIN], [CARD], [GUAT2], [HOFL], [JOHN], [LEWI4], [MELV], [STAD], [STAN], [STOL], [UN55], [UN66], [WASH], and [WATA]

99 Guatemala

See also *Mexico*.

Guatemala was conquered for Spain by Pedro de Alvarado in 1527. In 1821, the Captaincy-general of Guatemala (formed by Chiapas, Costa Rica, Guatemala, Honduras, Nicaragua and El Salvador) officially proclaimed its independence from Spain and became part of Mexico, a union that was dissolved 2 years later. Guatemala separated from Mexico in 1823 and became a constituent state of the Central American Federation. It formally became a separate country in 1847.

99.1 Currency

1925–:	1	Guatemalan quetzal	=	100 centavos de quetzal
1870–1925:	1	Guatemalan peso	=	100 centavos
1842–1870:	1	Guatemalan peso	=	8 reales = 16 medios = 32 cuartillos
1824–1842:	1	Central American escudo	=	2 pesos = 16 reales = 192 granos
–1824:	1	Spanish escudo	=	2 pesos = 16 reales

99.2 Units of Length

Before 1878 and after 1878

									Metric	Metric
legua^a									5572.705 m	5566.67 m
66 ² / ₃	cuadra								83.590 575 m	83.50 m
266 ² / ₃	4	cuerda							20.897 644 m	20.875 m
277 ⁷ / ₉	4 ¹ / ₆	1 ¹ / ₂₄	mecate or task						20.061 738 m	20.04 m
6666 ² / ₃	100	25	24	vara					835.905 75 mm	835.00 mm
20,000	300	75	72	3	pie, pièze, or tercia				278.635 25 mm	278.33 mm
26,666 ² / ₃	400	100	96	4	1 ¹ / ₃	cuarta or quarta			209.976 44 mm	208.75 mm
53,333 ¹ / ₃	800	200	192	8	2 ² / ₃	2	tercia		104.488 22 mm	104.375 mm
240,000	3600	900	864	36	12	9	4 ¹ / ₂	pulgada	23.219 6 mm	23.19 mm

^a1 **legua** (until the early eighteenth century) = the distance a man could walk in an hour = ~5500 m

US customary scale

			Metric
milla			1609.344 m
5280	pie		304.8 mm
63,360	12	pulgada	25.4 mm

In Santa Ana Mixtan

					Metric
vara					836.50 mm
3	pie				278.83 mm
4	$1\frac{1}{3}$	cuarta			209.125 mm
8	$2\frac{2}{3}$	2	tercia		104.562 mm
36	12	9	$4\frac{1}{2}$	pulgada	23.236 mm

Among Kaqchikel-speaking Mayas:

- 1 **makoh** (length defined by a rope passed over a man's body) = "The man stands erect, feet together, on one end of a rope. The free end of the rope is passed up to one hand, over the top of the head, through the other hand, and down to the feet, to touch the other end of the rope. The length of the rope, feet to feet, is a *makoh*." [BRIN]

99.3 Units of Area

Before 1878 and after 1878

				Metric	Metric
caballería				461,502.753 55 m ²	460,503.168 m ²
$64\frac{1}{2}$	manzana			7155.081 45 m ²	7139.584 m ²
645	10	cuerda		715.508 145 m ²	713.958 4 m ²
660,480	10,240	$32 \times 32 = 1024$	vara cuadrada	69.873 842 dm ²	69.722 5 dm ²

There were several sizes of *caballería*, *manzana* and *cuerda* in Guatemala. The Guatemala Ministerio de Agricultura reported several systems in use in 1950:

System with 1 manzana = 25 cuerdas

				Metric
caballería				446,220.8 m ²
64	manzana			6972.2 m ²
1600	25	cuerda (20 × 20 varas)		278.89 m ²
640,000	10,000	400	vara cuadrada	69.722 dm ²

System with 1 manzana = 11 cuerdas

				Metric
caballería				441,758.6 m ²
64	manzana			6902.5 m ²
704	11	cuerda (30 × 30 varas)		627.49 m ²
633,600	9900	900	vara cuadrada	69.722 dm ²

System with 1 manzana = 6¼ cuerdas

				Metric
caballería				446,220.8 m ²
64	manzana			6972.2 m ²
400	6¼	cuerda (40 × 40 varas)		1115.55 m ²
640,000	10,000	1600	vara cuadrada	69.722 dm ²

Below are some systems that have been reported by scholars.

System based on [JOHN]

				Metric
caballería				451,264.96 m ²
64½	manzana (100 × 100 varas)			6996.36 m ²
645,000	10,000		vara cuadrada	69.964 dm ²

System based on [MELV]

				Metric
caballería				444,344.83 m ²
64¾	manzana (100 × 100 varas)			6899.76 m ²
1030¾	16	cuerda		431.23 m ²
644,000	10,000	625	vara cuadrada	68.998 dm ²

System based on [MART3]

				Metric
caballería				448,189.984 2 m ²
64⅞	manzana (100 × 100 varas)			6987.371 7 m ²
641,428⅞	10,000		vara cuadrada	68.997 37 dm ²

System based on [WASH], [CARD], and [UN66]

			Metric	Metric	Metric
caballería			447,193.6 m ²	447,186.4 m ²	451,584 m ²
64	manzana		6987.4 m ²	6987.288 1 m ²	7056 m ²
640,000	10,000	vara cuadrada	69.874 dm ²	69.872 3 dm ²	70.56 dm ²

In Santa Ana Mixtan, based on [LEW14]

				Metric
caballería				447,828.640 m ²
64	manzana			6997.322 5 m ²
400	6¼	cuerda		1119.571 6 m ²
640,000	10,000	1600	vara cuadrada	69.973 225 dm ²

In Chimbal during the twentieth century, based on [WATA]

			Metric
manzana			7025.792 m ²
16	cuerda		439.112 m ²
10,000	625	vara cuadrada	70.257 dm ²

In the Ixil Community, based on [STAD] and [STOL]

				Metric
caballería				453,736.914 5 m ²
64.581 6	manzana			7025.792 4 m ²
1033.305 6	16	cuerda		439.112 025 m ²
645,816	10,000	625	vara cuadrada	70.257 924 dm ²

Scale used by Mayan tribes, based on [HOFL]

				Metric
kab'ayeriiyaj				460,165.2 m ²
66	mansaanaj			6972.2 m ²
1056	16	kweentaj		435.76 m ²
660,000	10,000	625	báaraj	69.722 dm ²

99.4 Units of Volume

Some reported measures:

83 piedi cubi (for timber of cedar) = 1.795 499 m²;

1 **vara** (for mahogany) = 1 vara × 1/9 vara × 1/2
vara = 32.45 dm³.

99.5 Units of Dry Capacity

Traditional system (two reported scales)

				Metric	Metric
fanega				55.64 L	55.501 000 L
12	celemin			4.64 L	4.625 083 L
25	2 ¹ / ₁₂	cajuela ^a		2.226 L	2.220 040 L
48	4	1 ²³ / ₂₅	cuartillo	1.159 L	1.156 271 L

^aSometimes also used for cacao, although cacao was usually sold by weight

Spanish-linked system

				Metric
arroba or cuartilla				16.132 992 L
8	azumbre			2.016 624 L
32	4	cuartillo		504.156 L
128	16	4	copa	126.039 mL

99.6 Units of Liquid Capacity

Traditional system

					Metric
fanega					55.55 L
$3\frac{1}{3}$	cajuella or cazuella				16.67 L
$83\frac{1}{3}$	25	botella ^a			666.67 mL
$106\frac{2}{3}$	32	$1\frac{7}{25}$	cuartillo ^b		520.83 mL
$333\frac{1}{3}$	35	4	$3\frac{1}{8}$	cuarta	166.67 mL

^aVaryied by location between 630 and 670 mL

^bAlso reported as 1.156 L (Spanish scale)

Spanish-linked system

			Metric
arroba			12.56 L
8	azumbre		1.57 L
32	4	cuartillo	392.5 mL

US customary-linked system

			Metric
garrafón			18.927 L
5	galón		3.785 4 L
25	5	botella	757.08 mL

For oil

		Metric
celemin		2.025 L
4	cuartillo	506.2 mL

99.7 Units of Weight

Before 1873

								Metric
tonelada								920.186 kg
$5\frac{1}{2}$	carga							161.032 kg
10	$1\frac{3}{4}$	fanega						92.019 kg
20	$3\frac{1}{2}$	2	quintal					46.009 kg
$57\frac{1}{2}$	$10\frac{9}{16}$	$5\frac{3}{4}$	$2\frac{7}{8}$	caja				16.003 kg
80	14	8	4	$1\frac{7}{23}$	arroba			11.502 kg
2000	350	200	100	$34\frac{18}{23}$	25	libra		460.093 g
32,000	5600	3200	1600	$556\frac{17}{23}$	400	16	onza	28.756 g

After 1873

							Metric
tonelada							920.240 kg
10	fanega						92.024 kg
20	2	quintal					46.012 kg
80	8	4	arroba				11.503 kg
2000	200	100	25	libra			460.120 g
32,000	3200	1600	400	16	onza		28.757 5 g

US customary-linked system

					US	Metric
fanega					150 lbs	68.038 8 kg
2	caja				75 lbs	34.019 4 kg
4	2	cuartilla			37½ lbs	17.009 7 kg
12	6	3	celemin		12½ lbs	5.669 9 kg
48	24	12	4	cuartillo	3⅞ lbs	1.417 5 kg

Some other measures reported between the sixteenth and twentieth centuries:

- 1 **fanega** (for corn) = 600 Castilian libras = 276.055 800 kg;
- 1 **bag** (for coffee beans during the twentieth century) = 72.57 kg (gross weight);
- 1 **zurron** or **tercio** (for indigo) = 150 Castilian libras = 69.013 950 kg;
- 1 **zurron** or **tercio** (for sugar) = 100 Castilian libras = 46.009 300 kg;
- 1 **quintal** (for coffee, rice, dried skins, and skins of goat) = 100 Castilian libras = 46.009 300 kg;
- 1 **quintal** (for cacao) = 60 Castilian libras = 27.605 580 kg;
- 1 **quintal** (for tobacco and sarsaparilla) = 25 Castilian libras = 11.502 325 kg;
- 1 **pan** (for fish in the northern Chalatenango province during the sixteenth century) = 17.253 487 kg (at Citala) and 11.502 325 kg (at Textutla);
- 1 **medio** (for corn) = 15 Castilian libras = 6.901 395 kg;
- 1 **arrelde** (for weighing tribute paid in fish by the Indians to the Spanish during the sixteenth century) = 4 Castilian libras = about 1.840 372 kg;
- 1 **quintal** (for balm of Peru and silver) = 1 Castilian libra = 460.093 g.

Metric-linked system

		Metric
quintal métrico		100 kg
100	libra métrico	1 kg

100 Guernsey

The Bailiwick of Guernsey has been a British Crown Dependency since the Norman Conquest of 1066. Guernsey includes Alderney, Brecqhou, Burhou, Herm, Jethou, Lihou, Sark, and some minor islands. The Germans occupied Guernsey from 1940 until 1945.

Main sources: [BERR], [BLAC], [DOUR], [LEWI6], and [STRA]

100.1 Currency

- 2002–: 1 euro = 100 euro-cents
- 1971–2002: 1 pound sterling = 100 pence
- 1921–1971: 1 Guernsey pound = 20 shillings = 240 pence
- 1921: 1 Guernsey pound = 14 livre tournois = 280 sous = 3360 deniers

Alderney:
1810: 1 Alderney pound = 20 shillings

100.2 Units of Length

British Imperial-linked scale

				Metric
mile				1609.344 m
1760	yard			914.4 mm
5280	3	foot		304.8 mm
63,360	36	12	inch	25.4 mm

100.3 Units of Area

British Imperial-linked scale

						Metric
carvee						18,729.252 864 m ²
12	bouvee^a					1560.771 072 m ²
60	5	Guernsey acre^a				312.154 214 m ²
240	20	4	vergee^b			78.038 554 m ²
9600	800	160	40	perch		1.950 964 m ²
201,600	16,800	3360	840	21	square foot	9.290 304 dm ²

^aUsed for the division of mansons

^bOne small vergee (petite mesure) = 36 perches = 70.234 704 m². Five verges were reported, by [LEWI6, p. 272], to be an area of land big enough to support a cow

100.4 Units of Dry Capacity

Two sets of measures for wheat and corn

					Small measure ^a	Metric	Large measure ^b	Metric
quarter					5440	89.144 L	6528	106.976 L
4	Guernsey bushel^c				1360	22.286 L	1632	26.744 L
8	2	cabotel			680	11.143 L	816	13.372 L
24	6	3	denerel		226.7	3.714 L	272	4.457 L
120	30	15	5	quint	43.3	742.9 mL	54.4	891.5 mL

^a[BERR, p. 120] describes the smaller measures (*petite mesure*) as exactly 5/6th of the larger measures. They were used, according to [STRA], in some manors for the payment of manorial rents

^bThe larger measures (*grande mesure*) were, according to [STRA], used in buying and selling, and for the payment of ordinary corn rents

^cConfusingly, [BERR, p. 118] states that “The Guernsey bushel contains six gallons, Winchester measure, or one thousand six hundred and thirty-two cubic inches; consequently, four bushels of wheat, of the Island measure, are exactly equal to three Winchester bushels.” As a Winchester gallon was 272.5 cu in, 6 gallons would be 1635 cu in. The Winchester bushel was 2150.42 cu in, so $\frac{3}{4}$ of this would only be 1612.8 cu in

Other measures reported during the nineteenth century:

1 **bushel** (for barley, lime, oats, peas, salt, and sea-coal) = 2110½ cu in = 34.584 898 m².

100.5 Units of Liquid Capacity

System based on [BERR] and [STRA]

					Cubic inches	Metric	Cubic inches	Metric
claret hogshead or Bordeaux hogshead					–	–	13,643.437 5	223.566 L
52½	gallon				252	4.129 L	259.875	4.259 L
105	2	pott or pottle			126	2.065 L	129.937 5	2.129 L
210	4	2	quart		63	1.032 L	64.968 75	1.065 L
420	8	4	2	pint	31½	516.2 mL	32.484 375	532.3 mL

100.6 Units of Weight

Rouen^a system in 1815, as reported by [BERR]

			Metric
hundredweight			48.884 kg
4	quarter		12.221 kg
100	25	pound	488.84 g

^aRouen is the historical capital city of Normandie

Paris system in 1833, as reported by [STRA]

						Metric
Guernsey pound or livre						379.553 g
2	marc					189.777 g
16	8	once				23.722 g
128	64	8	gros			2.965 g
384	192	24	3	denier		988.4 mg
9216	4608	576	72	24	grain	41.2 mg

101 Guinea [Formerly: French Guinea]

See also *Wassoulou Empire*.

After a long struggle with the native leader Samory Toure (c.1830–1900), France secured this area and administrated it as a part of Senegal until 1890. The area became, as French Guinea, a French colony in 1891. In 1893, a French decree separated Dahomey and Côte d'Ivoire from French Guinea, making them separate colonies. French Guinea was a part of French West Africa from 1895 until 1958, when it gained its independence as Guinea.

The metric system was adopted in 1906, and has been compulsory since 1910.

Main sources: [SUND] and [TAYL4]

101.1 Currency

1985–:	1 Guinean franc = 100 centimes
1972–1985:	1 syli = 100 cauris
1945–1972:	1 CFA franc = 100 centimes
1893–1945:	1 Guinean franc = 100 centimes
–1893:	1 macuta = 2000 zimbis (= cowries)

101.2 Units of Length

For linen and other textiles during the nineteenth to twentieth centuries

		English	Metric
jacktan, jactam, or jaktan		12 ft	3.657 567 m
6⅓	pik, covado, or cavid		577.511 m

101.3 Units of Capacity

Both dry commodities and liquids were sold by weight.

101.4 Units of Weight

Moorish system for rubber

		English	Metric
gamelle		1500 lbs	680.39 kg
1⅓	quantar or cantar	900 lbs	408.23 kg

Traditional upper scale

		Metric
quantar^a		977 kg
3	gammell	325⅔ kg

^aFor rubber, also reported as 979 kg

102 Guinea-Bissau [Formerly: Portuguese Guinea]

This area was discovered by the Portuguese navigator Nuno Tristao in 1446. From the early sixteenth century, the area was a part of the Kaabu Empire. Cacheu and Bissau became Portuguese colonies in 1614 and 1753, respectively. In 1879, they were united to form Portuguese Guinea. Guinea-Bissau gained its independence in 1974.

The metric system has been official since 1905, and compulsory since 1910.

102.1 Currency

1997–:	1 West African CFA franc =
	100 centimes
1975–1997:	1 Guinea-Bissau peso =
	100 centavos
1911–1975:	1 escudo = 100 centavos
–1911:	1 milréis = 1000 réis

102.2 Units of Length

Traditional system

		Metric
benda		6.411 2 m
8	usano or piso	801.4 mm

Portuguese-linked system

						Metric
braça						2.20 m
2	vara					1.10 m
$3\frac{1}{3}$	$1\frac{2}{3}$	côvado				660 mm
5	$2\frac{1}{2}$	$1\frac{1}{2}$	pé			440 mm
10	5	3	2	palmo		220 mm
80	40	24	16	8	polegada	27.5 mm

102.3 Units of Dry Capacity

Dry commodities were generally sold by weight.

Measure reported during the late nineteenth century:

1 **exequé** = 55.3 L.

102.4 Units of Liquid Capacity

Portuguese-linked system

						Metric
tonel						840.000 L
2	pipa					420.000 L
50	25	almude				16.800 L
100	50	2	pote			8.400 L
600	300	12	6	canada		1.400 L
2400	1200	48	24	4	quartilho	350 mL

102.5 Units of Weight

Portuguese-linked system

							Metric
tonelada							793.152 kg
13½	quintal						58.752 kg
54	4	arroba					14.688 kg
1728	128	32	arratel				459.000 g
6912	512	128	4	quarta			114.750 g
27,648	2048	512	16	4	onça		28.687 g
221,184	16,384	4096	128	32	8	oitava	3.586 g

For gold

						Metric
benda						64.08 g
2	benda-offa					32.04 g
3	1½	eggebas				21.36 g
8	4	2⅔		usano		8.01 g
128	64	42⅔		16	aki	500.6 mg

103 Kingdom of Gumma

See also *Ethiopia*.

This kingdom was established during the 1770s and lasted until 1899, when it was annexed by the Ethiopian Empire.

104 Gupta Empire (320–c.550)

See *India*.

105 Gurjara-Pratihara Empire (c.650–1036)

See *India*.

106 Guyana [Formerly: Dutch Guiana and British Guiana]

The coast of Guyana was sighted by Christopher Columbus in 1498, but the Dutch were the first to establish settlements, in 1581, and colonies in the area: Essequibo (in 1616), Berbice (in 1627) and Demarary (in 1752). The British exercised *de facto* control over these colonies after 1796. From 1803 until 1831, Essequibo and Demarary were administrated separately from Berbice. In 1814, the settlements were formally ceded to Britain, and in 1831, the three separate colonies became one single colony named British Guiana.

Guyana gained internal self-government in 1952, and achieved independence from Britain in 1966.

The English system for weights and measures was legally adopted in 1814, but the Dutch portion used some of the old Amsterdam measures well into the early twentieth century. The metric system has been official since 1971.

Main sources: [BAUE], [RUGG], and [UN66]

106.1 **Currency**

- 1966–: 1 Guyanese dollar = 100 cents
- 1965–1966: 1 East Caribbean dollar = 100 cents
- 1935–1965: 1 British West Indies dollar = 100 cents
- c.1839–1935: 1 Guianese gurd or dollar = 3 guilders = 100 cents
- c.1839: 1 Dutch guilder = 20 stivers

106.2 **Units of Area**

1 **Dutch acre**, **Rhineland acre**, or **Rhymland acre** = 1.050 4 acres = 4250.835 m² [ICA, p. 2]. It has also been reported as 1.052 acres = 4257.31 m² [The Commonwealth Office year-book 1967. H. M. S. O., p. 742], and 4260 m² [UN66].

106.3 **Units of Dry Capacity**

Some reported measures:

- 1 **tierce** (for sugar) = 42 English Wine gallons = 158.99 L;
- 1 **vat** (for sugar) = 31½ English Wine gallons = 119.24 L.

106.4 **Units of Liquid Capacity**

			Metric
anker			38.806 L
16	stoop		2.425 375 L
64	4	pintje	606.343 7 mL

Other reported measures:

- 1 **vat** = 84 English wine gallons = 317.97 L.

106.5 **Units of Weight**

Some reported measures:

- 1 **sack** or **bag** (for milled rice) = 180 lbs = 81.646 kg;
- 1 **sack** or **bag** (for rough rice) = 140 lbs = 63.503 kg;
- 1 **pond** = 531.3 g.

National Systems of Units and Currencies: H–I

1 Haiti [Formerly: French Saint Dominique]

See also *Dominican Republic*.

The island of Hispaniola was discovered by Christopher Columbus in 1492. The western part of the island was evacuated by the Spanish in 1605 and became a French colony in 1664. The island of Hispaniola was divided between French Saint Dominique (present-day Haiti) and Spanish Santo Domingo (present-day Dominican Republic) by the 1697 Treaty of Ryswick. The Dominican Republic became independent in 1844.

From the seventeenth century on, some Spanish and French measures were used alongside the traditional measures. Much of the French system for weights and measures, especially the one used in Paris, came to be used both locally at bazaars and in international trade. Some British units were also found to be in use. The metric system has been official since 1920, and compulsory since 1921.

Main sources: [MART3], [TARG], [UN55], and [UN66]

1.1 Currency

1870–:	1 Haitian gourde = 100 centimes or santim
1813–1870:	1 gourde = 100 centimes or santim
1664–1813:	1 piastre gourde = 8 livres colonials = 160 sous = 1920 deniers
1605–1664:	1 Spanish peso duro = 20 reales = 680 maravedi = 6800 dineros

1.2 Units of Length

Some traditional measures in Haitian Creole:

- 1 **bras** or **bwas** = the distance between a man's outstretched arms = about 1.9 m;
- 1 **lonn** or **lòn** = the distance between the elbow and the tip of the middle finger = about 450 mm;
- 1 **pye** = the length of a foot = about 290 mm;
- 1 **dwa** = the breadth of a man's finger = about 24 mm.

Spanish colonial system

			Metric
vara			835.9 cm
3	pie		278.6 mm
36	12	pulgada	23.219 mm

French colonial system (Haitian Creole and French names)

							Metric
lieue							3898.073 182 m
666 $\frac{2}{3}$	perch or perche						5.847 110 m
2000	3	toise					1.949 037 m
3 428 $\frac{4}{7}$	5 $\frac{1}{7}$	1 $\frac{1}{7}$	étape or pas				1.136 938 m
12,000	18	6	3 $\frac{1}{2}$	pye or pied			324.839 mm
144,000	216	72	18	12	pous or pouce		27.070 mm
1,728,000	2592	864	216	144	12	liy or ligne	2.256 mm

Other reported measures:

- 1 **pied anglais** = 1 Imperial foot = 30.48 cm;
 1 **aune** (for fabrics) = 1.40 m;
 1 **aune** (for cloth) = 1.188 446 m;
 1 **yad** (Haitian Creole name) = 1 English yard = 914.392 mm;
 1 **aune de Brabant** = 695.000 mm.

Other reported measures:

- 1 **labor** = 71.67 ha;
 1 **pied anglais carré** = 9.29 dm².

1.3 Units of Area

French colonial system (Haitian Creole and French names)

							Metric
caballerie							129,262.804 2 m ²
10	kawo or carreau						12,926.280 4 m ²
37 ^{1048/1296}	3 ^{1012/1296}	arpent					3418.869 3 m ²
3 780 ^{1120/1296}	378 ^{112/1296}	100	perch kare or perche carrée				34.188 693 m ²
34,027 $\frac{2}{9}$	3402 $\frac{2}{9}$	900	9	toise kare or toise carrée			3.798 744 m ²
100,000	10,000	2 644 ^{44/49}	26 ^{22/49}	2 ^{46/49}	étape kare or pas carrée		1.292 628 m ²
1,225,000	122,500	32,400	324	36	12 $\frac{1}{4}$	pye kare or pied carrée	10.552 1 dm ²

1.4 Units of Volume

French colonial system for timber (Haitian Creole and French names)

				Metric
toise kib or toise cube				7.403 890 m ³
1 ²⁶ / ₂₈	kòd or corde			3.839 054 m ³
3 ⁴⁸ / ₅₆	2	voie		1.919 527 m ³
216	112	56	pye kib or pied cube	34.277 dm ³

Other reported measures:

- 1 **twaz** or **twèz** (for timber and stones) = 3 pye 3
 pye 6 pye = 54 pye kib;
 1 **legno** (for mahogany) = 1000 pieds
 cubes = 34.277 270 m³.

Other reported measures:

- 1 **glòs** = a small bottle used for measuring
 cooking oil, etc.

Metric-linked system

			Metric
toise cube			8 m ³
2 ¹ / ₂	corde		3.84 m ³
80	38 ² / ₅	baril	100 dm ³

1.5 Units of Dry Capacity

Some traditional measures (Haitian Creole names):

- 1 **kanistè** or **kannistè** = tin container used for
 measuring flour, salt and grain;
 1 **pense** = a small amount that can be held
 between two fingers.

1.6 Units of Liquid Capacity

British Imperial-linked system (Haitian Creole and French names)

					Metric
barrique^a					227.118 600 L
60	galon or gallon				3.785 310 L
120	2	chodyè or pot^b			1.892 655 L
240	4	2	pent or pinte		946.327 mL
300	5	2½	1¼	boutéy or bouteille	757.062 mL

^aAfter metrification, also reported as 225 L

^bAfter metrification, also reported as 2 L

1.7 Units of Weight

French colonial system (Haitian Creole and French names)

							Metric
doum or tonneau							979.011 693 kg
2	legno ^a						489.505 85 kg
20	10	quintal ^b					48.950 585 kg
2000	1000	100	liv or livre française				489.506 g
32,000	16,000	1600	16	ons or once			30.594 g
256,000	128,000	12,800	128	8	gwo or gros		3.824 g
18,432,000	9,216,000	921,600	9216	576	72	greenn	53.115 mg

^aFor logwood, red wood and yellow wood

^bIt was mainly used for coffee, cacao, tobacco and cotton

Other reported measures:

1 **sak** or **sache** (for coffee) = 60 kg;

1 **centena** = 46 kg;

1 **livre américaine** = 453.592 g.

4.1 Currency

1938–1939: 1 piastre = 100 centimes

1938: 1 kuru = 40 paras = 100 santimes

2 Empire of Harsha (606–647)

See *India*.

3 Harvey Islands

See *Cook Islands*.

4 Hatay State

See also *Ottoman Empire* and *Turkey*.

This area was formerly part of the Aleppo province of the Ottoman Empire. The area was occupied by France at the end of World War I and constituted part of the French Mandate of Syria. It was declared as independent in 1938. The state was annexed by Turkey in 1939 and transformed into the Hatay Province.

5 Hausaland

See also *Niger* and *Nigeria*.

The Hausa people established the Hausa Bakwai (“Seven True Hausa States”) in West Africa around the seventh to eleventh centuries. The most powerful and important of these was the Kingdom of Kano, probably founded in 999. During the reign of Abdullahi Burja (1438–1452), trade relations with the Bornu kingdom were established. From the eighteenth century until the 1880s, leather and cotton were transported northward to Tripoli and Tunis. The Hausa culture remains one of the largest civilizations in West Africa.

Main source: [NEWM2]

5.1 Currency

1 àpò or òkè = 20,000 cowries

5.2 Units of Quantity

1 **kwaryā** (for kolanuts) = 100;

1 **hāuyā** = 20;

1 **basussuka** = a bundle of grass prepared for thatching;

1 **runumé** = a bundle of stalks;

1 **kundt** = a bundle of papers;

1 **kurshé** = a bundle of dried grass;

1 **dammfumma** = a bundle of grain or grass;

1 **kāi** = a bundle of firewood;

1 **gwammā** = a small bundle of corn or millet.

5.3 Units of Length

Some traditional measures:

1 **zìrai** = the distance from the elbow to the tip of the middle finger;

1 **tākà** = a pace;

1 **dāni** = the distance from the tip of the thumb to the tip of the middle finger;

1 **takì** = the span of the hand.

Some measures reported during the nineteenth century:

1 **mitā** = 1 m;

1 **sānda** (for cloth) = 1 yd = 914.39 mm;

1 **kāmù** (for fabrics) = the distance from the elbow to the tip of the middle finger = about 18 inches = about 457.2 mm;

1 **sàntimētà** = 10 mm.

5.4 Units of Area

Some reported measures:

1 **rasurgumt** = a large area of bush land.

5.5 Units of Dry Capacity

Some reported measures:

1 **rigingimu** = a large sack for storing peanuts or cotton;

1 **taiki** = a sack for various commodities;

1 **buhu** or **buhū** = a small sack for various commodities;

1 **tiya** = a bowl for grain;

1 **zakkà** = a small calabash or metal bowl used to measure corn for giving a religious tithe at the end of Ramadan.

5.6 Units of Liquid Acapacity

Some reported measures:

1 **jarkà** = the content of a jerry-can = about 20 L.

1 **litā** = 1 L;

1 **sàntilitā** = 10 mL.

5.7 Units of Weight

Some reported measures:

1 **wayā** or **lābà** = 1 lb av = 453.592 g.

6 Hawaii [Formerly: Sandwich Islands]

See also *the United States of America*.

The Hawaiian Islands were discovered in 1778 by Captain James Cook, who called them the Sandwich Islands. The Kingdom of the Hawaiian Islands was established in 1795 under King Kamehameha the Great. Hawaii became a Republic in 1894. The Hawaiian Islands were annexed by the United States in 1898, as a territory, and became a state in 1959.

The Kingdom of Hawaii adopted the weights and measures of Massachusetts in a law enacted on November 12, 1840, Ch. 9, section 1.

Main sources: [BAUE], [CLAR], [MATT], and [UN55]

6.1 Currency

1898–: 1 US dollar = 100 cents
 1847–1899: 1 akahi dala = 100 hapa haneli
 –1847: 1 British pound = 20 shillings = 240 pence
 1 US dollars = 100 cents

6.2 Units of Length

Traditional measures reported before 1840:

1 **anana** = the distance between the fingertips of the outstretched arms;
 1 **iwilei** = the length of an outstretched arm;
 1 **kubita** = a cubit;
 1 **kapua'i** = the length of a foot;
 1 **kahaha** or **pahahd** = the length of a hand;
 1 **pua'ama** = the length of a finger.

US linked system after 1840

				Metric
ananan				1.828 8 m
2	iwilei			914.4 mm
6	3	kapua'i		304.8 mm
72	36	12	pua'ama	25.4 mm

Other measures reported during the nineteenth century:

1 **mile los** = a nautical mile;
 1 **'anae** = about 300 mm or more;
 1 **'ama'ama** = about 200 mm.

6.3 Units of Liquid Capacity

Some reported measures:

1 **barrel** (for whale oil) = 31½ old Wine gallons = 119.237 265 L.

6.4 Units of Weight

US linked system after 1840

				Metric
ton				907.185 305 kg
20	hundred weight			45.359 265 kg
80	4	quarter		11.339 816 kg
2000	100	25	pound	452.593 mg

7 Heard Island and McDonald Islands (Territory of Heard Island and McDonald Islands)

These islands are currently uninhabited. They have been territories of Australia since 1947.

8 Hejaz

See also *Ottoman Empire* and *Saudi Arabia*.

Hejaz was a province of Arabia, becoming a part of Egypt in 1258, and with that country, from 1517, under the name of Egypt Eyalet, a part of the Ottoman Empire. In 1916, the Emir of Mecca declared himself, in agreement with the British, independent of the Ottoman Empire, adopting the title King of Hejaz. Abd Al-Aziz Bin Sa'ud of Nejd conquered Hejaz in 1925 and combined Hejaz and Nejd into a single kingdom in 1926. In 1932, the area became included in the kingdom of Saudi Arabia.

8.1 Currency

1932–1953: 1 Saudi riyal (ريال) = 20 ghirsh (قرش) = 100 halalas (هلاله)
 1916–1925: 1 Hejaz riyal (ريا) = 20 ghirsh (قرش)
 1844–1916: 1 Ottoman lira (ليرا) = 100 kuruş (كروش) = 4000 para (پاره)

8.2 Units of Length

1 **guz** (at Jeddah) = 635.00 mm;
1 **covid** (at Jeddah) = 482.593 45 mm.

Other reported measures:

1 **adila** (at Jeddah) = $\frac{1}{2}$ himl = about 125–150 kg;
1 **okka** (at Jeddah) = 1.050 kg.

8.3 Units of Dry Capacity

Two reported scales for rice at Jeddah (by weight)

		Metric	Metric
tomaun or teman		84.898 928 2 kg	84.898 900 kg
40	kella or mekmeda	2.122 473 2 kg	2.122 472 kg

8.4 Units of Liquid Capacity

			Metric
cuddi or gudda			7.570 00 L
8	nusfia		946.250 mL
128	16	vacheia	59.141 mL

8.5 Units of Weight

Two reported scales at Jeddah

						Metric	Metric
bahar						83.047 235 kg	83.045 900 kg
10	frazil					8.304 723 kg	8.304 590 kg
100	10	maund				830.472 35 g	830.459 g
200	20	2	rotoli			415.236 175 g	415.230 g
3000	300	30	15	wakia		27.682 412 g	27.682 g
28,800	2880	288	144	9 $\frac{1}{2}$	derhem	2.883 584 mg	2.884 g

Raṭl-scale at Jeddah

		Metric
raṭl		360 g
113	derhem	3.186 g

Maund-scale at Jeddah

				Metric
maund				830.07 g
5	rotoli			166.01 g
75	15	wakia		11.07 g
720	144	9 $\frac{1}{2}$	derhem	1.15 g

9 Heligoland

See also *Denmark* and *United Kingdom*.

Heligoland belonged to Denmark from 1714 until 1807, when British troops occupied the island and turned it into a British colony. The Heligoland-Zanzibar Treaty in 1890 was an exchange between Britain and Germany, which gave Germany Heligoland in exchange for Zanzibar.

Main source: [BAUE]

9.1 Currency

1924–1948: 1 German Reichmark = 100 Pfennig

1923–1924: 1 German Rentemark = 100 Pfennig

1914–1923: 1 German Papiermark = 100 Pfennig

1890–1914: 1 German Goldmark = 16 Shillingen = 100 Pfennig

1807–1890: 1 English sovereigns

9.2 Units of Length

1 **fod** (Rheinfuß) = 314.07 mm.

British Imperial system during the nineteenth century

				Metric
mile				1609.343 m
1760	yard			914.399 mm
5280	3	foot		304.8 mm
63,360	36	12	inch	25.4 mm

German system during the late nineteenth century

		Metric
Kurze Elle		573.143 mm
2	Fuß	286.571 mm

Other measures reported during the nineteenth century:

1 **Brabanter Elle** (for linen) = 691.410 mm.

9.3 Units of Area

1 **acre** = 4046 m².

9.4 Units of Dry Capacity

For dry goods in general during the late nineteenth century

				Metric
Last				1669.454 889 L
12	Tonne			139.121 241 L
96	8	Scheffel		17.390 156 L
384	32	4	Viertel	4.347 539 L

For coal during the late nineteenth century

			Metric
Keel			20,355.246 778 L
10	Last		2035.524 678 L
560	56	Buschel	36.348 655 L

9.5 Units of Liquid Capacity

German-linked system during the late nineteenth century

							Metric
Ohm							144.910 000 L
4	Anker						36.227 500 L
20	5	Viertel					7.245 500 L
40	10	2	Stübchen				3.622 750 L
80	20	4	2	Kanne			1.811 375 L
160	40	8	4	2	Quartier		905.687 5 mL
320	80	16	8	4	2	Oessel	452.843 75 mL

9.6 Units of Weight

1 **pund** = 499.75 g.

German-linked system during the late nineteenth century

					Metric
Centner^a					54.367 274 kg
8	Liespfund				6.795 909 g
112	14	Pfund			485.422 g
3584	448	32	Loth		15.169 g
14,336	1792	128	4	Quentchen	3.792 4 g

^a[BAUE] also reported it as 104 Holstein Pfund

10 Holy See

See *Papal States*.

since 1869, becoming official in 1910 and compulsory since 1912.

Main sources: [CARD], [ECON], [UN55], [UN66], and [WELL3]

11 Honduras

See also *Mexico*.

Christopher Columbus landed at Cape Honduras in 1502. Honduras was made part of the Captaincy-General of Guatemala within the Vice-Royalty of New Spain in 1539. Guatemala was part of Mexico from 1821 until 1823, when it became a constituent state of the Central American Federation. Honduras was originally divided into the Provinces of Comayagua and Tegucigalpa, which were joined to create Honduras in 1824. Honduras became a separate independent nation in 1838.

From the mid-sixteenth century, the nation's weights and measures were based on the Spanish systems of measurement. Each department had its own local names for these measures; some of these names were mixed with words taken from Miskito, Sumo, Tolupan, and other indigenous languages. Below, only the Spanish names are given. The metric weight system has been in use

11.1 Currency

1931–:	1 Honduran lempira = 100 centavos
1871–1931:	1 Honduran peso = 100 centavos
1862–1870:	1 Honduran peso = 8 reales
1832–1862:	1 Honduran real = 2 medios = 4 cuartillos = 12 granos
1824–1838:	1 Central American Republic escudo = 2 pesos = 16 reales
–1824:	1 Spanish colonial escudo = 2 pesos = 16 reales

11.2 Units of Length

Upper scale, based on [WELL3]

				Metric
league				5653.023 9 m
3	milla			1884.341 3 m
4	1 $\frac{1}{3}$	quarto		1413.256 m
6 666 $\frac{2}{3}$	2 222 $\frac{2}{9}$	1 666 $\frac{2}{3}$	vara	847.954 mm

Lower scale, based on [WELL3]

									Metric
mecate									20.350 886 m
24	vara ^a								847.954 mm
48	2	media							423.977 mm
72	3	1½	tercia						282.651 mm
96	4	2	1⅓	cuarta					211.988 mm
144	6	3	2	1½	sesma				141.326 mm
192	8	4	2⅔	2	1⅓	ochara			105.994 mm
864	36	18	12	9	6	4½	pulgada		23.554 mm
1152	48	24	16	12	8	6	1⅓	dedo	17.666 mm

^aAlso reported, by [CARD], as 812.8 mm

According to United States Congressional serial set, no. 4845 (1905); [UN66] and [ECON]

							Metric	Metric
legua							4179.525 m	4175 m
2¼	milla						1857.567 m	1855 m
5000	2222%	vara					835.905 mm	835 mm
15,000	6 666%	3	pie				278.635 mm	278.333 mm
180,000	80,000	36	12	pulgada			23.220 mm	23.194 mm
2,160,000	960,000	432	144	12	linea		1.935 mm	1.932 9 mm
25,920,000	11,520,000	5184	1728	144	12	punto	161.25 µm	161.07 µm

11.3 Units of Area

Castilian-linked system

			Metric
caballeria ^a			448,189.984 2 m ²
64⅓	manzana		6987.371 7 m ²
641,428⅔	10,000	vara cuadrada	69.873 717 dm ²

^aSaid to have originated with the early settlers, who designated sections of land that could be encompassed by a swift horse in a given time as “cabellarias

During the early twentieth century

				Metric
caballeria ^a				450,279.14 m ²
~64,535 331	manzana			6977.25 m ²
~645,353.31	10,000	vara cuadrada		69,722 5 dm ²
~5,808,179.9	90,000	9	pie cuadrada	7.746 9 dm ²

^aDuring the late nineteenth century, according to [WELL3], equal to $1136\frac{1}{2}$ varas \times $568\frac{1}{2}$ varas = about 451,454.260 m²

11.4 Units of Dry Capacity

Commodities like coffee, sugar, rice, tobacco, sarsaparilla, cochineal, and and indigo were generally sold by weight.

For cereals

						Metric
cahiz						697.843 L
12	fanega					58.153 L
144	12	celemin				4.846 L
288	24	2	medio			2.423 L
576	48	4	2	cuarta		1.211 L
4608	384	32	16	8	medida	151.4 mL

For beans and potatoes

		Metric
fanega		55.501 L
25	cajuella ^a	2.220 04 L

^aAlso used for cacao

11.5 Units of Liquid Capacity

For wine, based on [WELL3]

					Metric
botta					578.945 L
1 $\frac{3}{8}$	moyo				308.770 L
3 $\frac{3}{4}$	2	azumbre			154.385 L
30	16	8	arroba ^a		19.298 L
120	64	32	4	quartillo	4.824 L

^a1 **arroba** (for oil) = 15.154 L

For other commodities

					Metric
cajuella					17.28 L
5	galón				3.456 L
25	5	botella			691.2 mL
32	6 $\frac{2}{5}$	1 $\frac{1}{25}$	cuartillo		540.0 mL
600	120	24	18 $\frac{3}{4}$	onza	28.8 mL

11.6 Units of Weight

Castilian-linked system

							Metric
tonelada							920.186 kg
5 $\frac{1}{2}$	carga						161.032 kg
10	1 $\frac{3}{4}$	fanega					92.018 6 kg
20	3 $\frac{1}{2}$	2	quintal				46.009 3 kg
57 $\frac{1}{2}$	10 $\frac{3}{16}$	5 $\frac{3}{4}$	2 $\frac{7}{8}$	caja			16.003 2 kg
2000	350	200	100	34 $\frac{18}{23}$	libra		460.093 g
32,000	5600	3200	1600	556 $\frac{17}{23}$	16	onza	28.775 8 g

Traditional system and metric-linked system

									Metric	Metric
tonelada ^a									907.780 kg	920 kg
20	quintal								45.389 kg	46 kg
80	4	arroba							11.347 kg	11.5 kg
640	32	8	mancuerna						1.418 4 kg	1.437 5 kg
2000	100	25	3⅜	libra					453.890 g	460 g
32,000	1600	400	50	16	onza				28.368 g	28.750 g
128,000	6400	1600	200	64	4	quarta			7.092 g	7.187 5 g
512,000	25,600	6400	800	256	16	4	adarme or artienzo		1.773 g	1.797 g
8,192,000	409,600	102,400	12,800	1600	256	64	16	grano	110.8 mg	112.3 mg

^aAlso reported as 907.185 kg

British Imperial-linked system for corn

		Imperial	Metric
red de maíz		100 lbs av	45.359 2 kg
40	mano de maíz	2 $\frac{1}{2}$ lbs av	1.134 kg

For gold

					Metric
libra					453.890 g
2	marco				226.945 g
16	8	onza			28.368 g
800	400	50	tomin		567.4 mg
9600	4800	600	12	grano	47.3 mg

For silver

			Metric
libra			497.656 g
16	onza		31.103 5 g
7680	480	grano	64.799 mg

Other reported measures:

1 **tercio** or **zurrone** (for indigo or cochineal) = 150 libras = 69.013 95 kg;1 **saco** (for coffee) = 150 libras = 69.013 95 kg;

- 1 **quintal** (for rice and coffee) = 100 libras = 46.009 3 kg;
 1 **tercio** (for sugar) = 100 libras = 46.009 3 kg;
 1 **fardo de tabaco** (for tobacco) = 100 libras = 46.009 3 kg;
 1 **arroba** (for sarsaparilla and tobacco) = 25 libras = 11.502 325 kg;
 1 **media** (for cacao) = 7½ libras = 3.450 698 kg.

12 Hong Kong

See also *China*.

China ceded Hong Kong Island to Britain in 1842, and the area became a crown colony in 1843. China further ceded Kowloon Peninsula and Stonecutters Island in 1860, and Britain leased the New Territories for 99 years in 1898. The Japanese occupied Hong Kong from 1941 until 1945. Hong Kong was returned to China and became a Special Administrative Region of China in 1997.

12.1 Currency

- 1895–: 1 Hong Kong dollar = 100 cents
 1842–1895: 1 East Indian rupee = 16 annas = 64 paise
 –1842: 1 peso = 100 centavos and 1 - Indian rupee = 100 paise

12.2 Units of Length

Chinese-linked system

			尺	寸	分	Metric
lei^a						557.212 5 m
150	cheung^a					3.714 75 m
625	4%	ma^c				891.540 mm
1500	10	2%	chek or cheh^b			371.475 mm
15,000	100	24	10	tsún		37.147 5 mm
150,000	1000	240	100	10	fen, fan, or fun	3.714 75 mm

^aVarying from 646 to 681 m

^bVarying according to trade, in which it represents anything from 29.21 to 37.15 cm

^cUsually used for fabric

12.3 Units of Area

畝	分	丈		尺	Metric
tsin					761.40 m ²
10	fan				76.140 m ²
60	6	cheong			12.690 m ²
240	24	4	pu		3.172 5 m ²
6000	600	100	25	chek	12.69 dm ²

Some other reported measures:

- 1 **mow** = 842.82 m²;
 1 **dau chung** = 674.5 m².

12.4 Units of Capacity

Traditional system

石			Metric
seak			103.100 L
10	ganta		10.310 L
100	10	chupa	1.031 L

Metric-linked system

				Metric
Seh				100 L
10	dau			10 L
100	10	sing		1 L
1000	100	10	hop	100 mL

12.5 Units of Weight

Chinese-linked system

担	斤	兩	錢	分	厘	Metric
darm, picul, dàn, or tam						60.478 982 kg
100	gun, catty, jin, or kan					604.789 82 g
1600	16	leung, tael, or tahl				37.799 363 75 g
16,000	160	10	chin, mace, qián, or tsin			3.779 936 375 g
160,000	1600	100	10	fun, candareen, fan, or hoon		377.993 637 5 mg
1,600,000	16,000	1000	100	10	lei or lí	37.799 363 75 mg

For gold and silver

金衡兩	金衡錢	金衡分	Metric
tael troy			37.429 0 g
10	mace troy		3.742 9 g
100	10	candereen troy	374.29 mg

13 Hoysala Empire (1026–1343)

See *India*.

14 Howland Island

See *United States of America*.

The Howland Island is one of the United States Minor Outlying Islands. The only human population consists of temporarily stationed scientific and military personnel.

15 Hungary

See also *Austria, Austria-Hungary, Bohemia, and Ottoman Empire*.

The Kingdom of Hungary was founded in 1001. The Ottoman Empire defeated the Hungarians at the Battle of Mohács in 1526, and much of the country found itself under Ottoman rule during the sixteenth and seventeenth centuries. The Ottomans were defeated by

Austria and Hungary in 1697, and the Habsburgs ruled over the Hungarians until 1918. As a result of the Austro-Hungarian Compromise of 1867, Austria and Hungary became independent entities in a constitutional monarchic union that lasted until 1918. Hungary was a republic from 1918 until 1920, a kingdom without a king from 1920 until 1945, a People’s Republic from 1945 until 1989, and has been a republic since 1989.

The measurement systems used during the sixteenth–eighteenth centuries were influenced by the Ottoman systems. From 1764 until 1876, the system of weights and measures was generally based on the system used in Vienna. Law No. 16/1872 introduced the metric system. The metric system has been compulsory since 1876, as has SI since 1980.

Main sources: [BOGD], [BOGD2], [BOGD3], [DOUR], [MART3], [UN55], and [UN66]

15.1 Currency

- 1946–: 1 Hungarian forint = 100 fillér
- 1945: 1 Russian ruble = 100 kopeks
- 1927–1945: 1 Hungarian pengő or pengoe = 100 fillér
- 1919–1926: 1 Hungarian korona = 100 fillér
- 1892–1918: 1 Austro-Hungarian krone or korona = 100 heller
- 1857–1891: 1 Austro-Hungarian forint = 100 krajczár

- 1754–1856: 1 Austro-Hungarian forint = 60 krajczár
 1658–1775: 1 Hungarian poltura = 1½ krajczár = 2½ denare

15.2 Units of Length

Hungarian system during the thirteenth–fourteenth centuries

		Metric
mérföld ^a		1740–8360 m
1000–4500	kettöslépés	1.74–1.86 m

^aKnown since 1236. The old, **mérföld régi** = 11,376 m, and the new, **mérföld új** = 8350 m

In present-day Slovakia after 1311 and scale introduced during the fifteenth century

			Metric	Metric
kráľovská siaha			1.800 51 m	2.125 m
5	laket		360.102 mm	425 mm
10	2	piad	180.051 mm	212.5 mm

Royal scale after 1345

										Metric
öl ^a										3.126 m
1⅓	kettöslépés ^b									1.875 6 m
3⅓	2	lépés ^c								937.8 mm
5	3	1½	rőf ^d							625.2 mm
10	6	3	2	láb ^e						312.6 mm
16	9⅓	4⅓	3⅓	1⅓	arasz ^f					195.4 mm
40	24	12	8	4	2½	tenyér ^g				78.15 mm
120	72	36	24	12	7½	3	hüvelyk ^h			26.05 mm
160	96	48	32	16	10	4	1⅓	ujj ⁱ		19.53 mm
640	384	192	128	64	40	16	5⅓	4	árpaszem (bere grain)	4.88 mm

^aIn concept, a fathom. Known since 1091, varying between 1.8 and 3.1 m. In Preßburg, present-day Bratislava in Slovakia = 1.9 m

^bIn concept, a double step

^cIn concept, a step. Known since 1262, and varying between 632 and 938 mm

^dIn concept, an ell. Known since 1255, varying between 583 and 783 mm. In Preßburg, present-day Bratislava in Slovakia = 783 mm

^eIn concept, a foot. Known since 1266, and varying between 189 and 336 mm

^fIn concept, a span. Known since 1345, varying between 180 and 266 mm. In Preßburg, present-day Bratislava in Slovakia = 266 mm

^gIn concept, the width of a hand. Known since 1247, varying between 80 and 110 mm. In Preßburg, present-day Bratislava = 93 mm

^hIn concept, the width of a finger. Known since 1279, varying between 19 and 31 mm. In Preßburg, present Bratislava = 31.8 mm

ⁱIn concept, an inch. Known since 1244, varying between 17 and 20 mm

Hungarian system during the eighteenth century

				Metric
postaállomás^a				15,171.8 m
2	mérföld or Rakúska míl'a			7585.9 m
4	2	órajárás^b		3792.9 m
50 $\frac{2}{3}$	25 $\frac{1}{3}$	12 $\frac{2}{3}$	pisztolylövés	299.4 m

^aKnown since 1785^bKnown since the late seventeenth century

System used by tailors during the eighteenth century

						Metric
sing						622.0 mm
2	félsing					311.0 mm
4	2	fertály				155.5 mm
8	4	2	félfertály			77.75 mm
16	8	4	2	fúrás		38.87 mm
32	16	8	4	2	percentés	19.44 mm

Various units reported until the late eighteenth century:

- 1 **uhorská míl'a** = 8353.6 m;
- 1 **órajárás** = ("an hour's walk", during the seventeenth century) = ~3800 m;
- 1 **stádium** (known since 1400, but based on the ancient Roman measure) = 125 római kettöslépés = 184.8 m;
- 1 **strelenie z pušky** = varying between 100–300 m;
- 1 **bála** (for fabrics, known since 1344) = varying between 2 and 12 vég = between 50 and 300 m;
- 1 **hod sekerou or strelenie šipu z luku** = ~60–70 m;
- 1 **kötél** (known since 1208) = varying between 7 and 60 m;
- 1 **hod kamenřom** = ~45 m;
- 1 **hod sekerou** = ~35 m;

- 1 **hod kyjakom** = ~30 m;
- 1 **vég** (for canvas, known since 1255) = ~28 m;
- 1 **vég** (for cloth, known since 1255) = ~20 m;
- 1 **kerékfordulás** (during the seventeenth century) = 3.38 m;
- 1 **rúd** (known since 1295) = 1 reported as 3.79 m in the Austro-Hungarian scale, and as 1.55 m when used for cloth.
- 1 **Elle** (for linen in Pest) = 623.37 mm;
- 1 **hajtvány** (for fabrics during the seventeenth century) = varying between 620 and 930 mm;
- 1 **Ell** (in Buda) = 573.8 mm or 779.2 mm (Austro-Hungarian scale);
- 1 **Ell** (in Preßburg, present-day Bratislava in Slovakia) = 558.1 mm;
- 1 **láb** (for mining = "a foot") = 361 mm;
- 1 **láb** (Royal scale = "a foot") = 312.6 mm;
- 1 **fertály** (generally for fabrics during the eighteenth century) = 155 mm;
- 1 **vonás** (known since 1757 in present-day Slovakia) = 6.5 mm.

Hungarian system during the eighteenth century

							Metric
mérföld or míl'a							8354.417 m
4 404 $\frac{19}{24}$	öl or Klafter						1.896 666 m
5285 $\frac{3}{4}$	1 $\frac{1}{2}$	Stab					1.580 555 m
26,428 $\frac{3}{4}$	6	5	láb or Fuss				316.110 95 m
79,286 $\frac{1}{4}$	18	15	3	marok^a or Faust			105.370 32 mm

(continued)

								Metric
317,145	72	60	12	4	Zoll			26.342 6 mm
1,268,580	288	240	48	16	4	vonás^b or Strich		6.585 6 mm
2,537,160	576	480	96	32	8	2	Achtel	3.292 8 mm

^aKnown since 1770^bKnown since 1757

Czech-linked system during the eighteenth century

					Metric
siaha					1.896 483 8 mm
2 $\frac{1}{2}$	laket				737.521 5 mm
6	2 $\frac{1}{3}$	stopa			316.080 6 mm
72	28	12	palec		26.340 mm
864	336	144	12	ciarka	2.195 mm

Vienna-linked system during the early nineteenth century

						Metric
viedenská siaha, viedenská öl, or rakouská sáh						1.896 483 6 m
6	rakouská stôpa					316.080 6 mm
18	3	rakouská pěst				105.360 2 mm
72	12	4	rakouská palec			26.340 1 mm
864	144	48	12	rakouská čiarka		2.195 mm
10,368	1728	576	144	12	polovinè or pont^a	182.917 µm

^aKnown since 1768

Other units reported during the nineteenth century:

- 1 **unhorská milà** (during the nineteenth century) = 8533.6 m;
- 1 **merföld** (in Budapest during the late nineteenth century) = 8353.6 m;
- 1 **poštovní mile** = 7585.936 m;
- 1 **tengeri mérföld** = 1852 m;
- 1 **inženýrský prut** = 3.160 81 m;
- 1 **loket** or **viedenská laket** = 777.558 mm;
- 1 **kis ref** (for canvas) = 622.047 mm.

15.3 Units of Area

In present-day Slovakia during the fifteenth century

		Metric
poplužie		~585,225 m ²
150	kráľovské jutro	~3901.5 m ²

Royal system used in present-day Slovakia until the early eighteenth century

					Metric
poplužie^a					420,141.979 5 m ²
–	királyi hold				8439.998 37 m ²
150	–	kráľovské jutro or kráľovská miera			2800.946 53 m ²
–	2347	–	négyszögöl		3.596 079 m ²
127,200	2555¼	848	–	kráľovská štvorcová siaha	3.303 003 m ²

^a[ZUBA] also reported as 400,010 m²

Royal system used in present-day Hungary until the early nineteenth century

		Metric
királyi hold		8441.342 244 m ²
2347	négyszögöl	3.596 652 m ²

In present-day Slovakia until the early nineteenth century

			Metric
poplužie			457,500.24 m ²
150	jutro		3050.001 6 m ²
127,200	848	štvorcová siaha	3.596 7 m ²

Vienna-linked system during the early nineteenth century in present-day Slovakia

					Metric
viedenské jutro					5754.641 6 m ²
1⅓	uhorské jutro				4315.981 2 m ²
1600	1200	viedenská štvorcová siaha			3.596 651 m ²
57,600	43,200	36	štvorcová stopa		9.990 7 dm ²
8,294,400	6,220,800	5184	144	štvorcový palec	6.937 9 cm ²

Vienna-linked system as reported during the late nineteenth century in present-day Czech Republic

					Metric
jitra					5754.641 6 m ²
1600	řemenový sáh				3.596 651 m ²
9600	6	řemenová stopa			59.944 183 dm ²
115,200	72	12	řemenový palec		4.995 349 dm ²

(continued)

						Metric
1,382,400	864	144	12	řemenová čarka		41.627 9 cm ²
16,588,800	10,368	1728	144	12	řemenová tečka	3.469 0 cm ²

Upper Vienna-linked system as reported during the late nineteenth century in present-day Hungary

					Metric
katasztrális hold					5754.641 6 m ²
1 $\frac{1}{3}$	magyar hold or Hungarian yoke				4315.981 2 m ²
1 $\frac{1}{3}$	1 $\frac{1}{3}$	(small) Hungarian yoke			3596.651 m ²
1600	1200	1000		négyszögöl or marfold	3.596 651 m ²

Middle Vienna-linked system as reported during the late nineteenth century in present-day Hungary

						Metric
magyar hold, Jochacker, or Hungarian yoke						4315.981 2 m ²
1 $\frac{1}{2}$	Viertel					2877.320 8 m ²
4 $\frac{1}{3}$	3 $\frac{1}{3}$	Hauer				899.162 75 m ²
6	4	1 $\frac{1}{4}$	Motika			719.330 2 m ²
15	10	3 $\frac{1}{3}$	2 $\frac{1}{2}$	Pfund		287.732 08 m ²
1200	800	250	200	80	négyszögöl, marfold, or řemenový sáh	3.596 651 m ²

Lower Vienna-linked system as reported during the late nineteenth century in present-day Hungary

			Metric
négyszögöl or marfold			3.596 651 m ²
36	bécsi négyszögláb		9.990 7 dm ²
5184	144	bécsi négyszög hüvelyk	6.937 9 cm ²

For vineyards in Preßburg, present-day Bratislava in Slovakia

		Metric
Hauer		719.330 m ²
200	Quadratklafter	3.597 m ²

Alternative system for vineyards in Preßburg, present-day Bratislava in Slovakia

		Metric
Hauer		889.163 m ²
250	Quadratklafter	3.557 m ²

In Transdanubia

		Metric
kis hold		3586.25 m ²
1000	négyszögöl	3.586 25 m ²

15.4 Units of Volume

1 regisztertonna = 2.831 6 m³

15.5 Units of Dry Capacity

				Metric
vel'ký okov				68.720 4 L
4 $\frac{1}{2}$	štvrtí			15.271 2 L
36	8	vel'ká pinta		1.908 9 L
72	16	2	vel'ká holba	954.45 mL

In Bazin, present-day Pezinok in Slovakia

					Metric
vel'ký okov					60.236 4 L
1½	okov				40.157 6 L
6	4	štvrt			10.039 4 L
36	24	6	pinta		1.673 2 L
72	48	12	2	holba	836.6 mL

In Debrecen and Miskolc

				Metric
Kübel, köboly, or zsák				127.260 L
2		kila		63.630 L
4		2	vika	31.815 L

In Garamszentbenedek, present-day Hronský Beňadik in Slovakia

					Metric
vel'ký okov					61.084 8 L
1½	okov				40.723 2 L
6	4	štvrt			10.180 8 L
36	24	6	pinta		1.696 8 L
72	48	12	2	holba	848.4 mL

In Pest during the eighteenth century

		Metric
Kübel, köboly, or zsák		125.036 19 L
1⅓	pesti mérő or Metze	93.777 14 L

In Pest after 1874

								Metric
Kübel, köboly, or zsák								187.590 L
2	pesti kila							93.795 L
3	1½	pozsonyi kila						62.530 L
6	3	2	véka or koretz					31.265 L
112½	56¼	37½	18¾	pint				1.667 467 L
225	112½	75	37½	2	icze			833.733 mL
450	225	150	75	4	2	meszely		416.867 mL
900	450	300	150	8	4	2	fél meszely	208.433 mL

In Preßburg, present-day Bratislava in Slovakia, before 1715

		Metric
merica väčšia^a		62.392 5 L
74	holba	843.14 mL

^aUsed since 1551

In Preßburg, present-day Bratislava in Slovakia, after 1715

						Metric
Malter						1590.750 L
12½	Kübel					127.260 L
25	2	pozsonyi mérő, bratislavský okov, merica bratislavská, or Metzen				63.630 L
937½	75	37½	pinta			1.696 8 L
1875	150	75	2	holba or Halbe		848.40 L
7500	600	300	8	4	Rimpel	212.10 L

In Preßburg, present-day Bratislava in Slovakia, after 1807

						Metric
Malter						1357.440 L
12½	Kübel					108.595 2 L
20	1⅔	džber				67.872 L
25	2	1¼	pozsonyi mérő, bratislavský okov, merica bratislavská, or Metzen			54.297 6 L
800	64	40	32	pinta		1.696 8 L
1600	128	80	64	2	holba or Halbe	848.40 mL
6400	512	320	256	8	4	Rimpel 212.10 mL

In Preßburg, present-day Bratislava in Slovakia, after 1813, after 1853 and after 1874

			Metric	Metric	Metric
Malter			1590.750 L	1562.011 2 L	1563.25 L
12½	Kübel		127.260 L	124.960 89 L	125.06 L
25	2	pozsonyi mérő, merica bratislavská, or Metzen	63.630 L	62.480 447 L	62.530 L

Upper scale during the late eighteenth century in present-day Slovakia

			Metric
fúr			1493.311 232–1919.971 584 L
1⅓–1§	tretiník		1066.650 88–1279.981 056 L
28–36	20–24	merica, okov, or urna	53.332 544 L

Lower scale during the late eighteenth century in present-day Slovakia

								Metric
kíla or kubulus								159.997 632 L
1½	gbel							106.665 088 L
3	2	merica, okov, or urna						53.332 544 L
6	4	2	víko					26.666 272 L
12	8	4	2	štvrt				13.333 136 L
96	64	32	16	8	pinta			1.666 642 L
192	128	64	32	16	2	holba		833.321 mL
384	256	128	64	32	4	2	žajdlík	416.660 5 mL

Vienna-linked system in present-day Slovakia

		Metric
viedenský okov^a		56.589 L
40	pint	1.414 7 L

^a 1 **viedenský merica** = 61.486 821 L

In Sárosp

		Metric
Kübel		63.630 L
2	Koretz	31.815 L

In Temešvár, now part of the Czech Republic

				Metric
large schinek				127.260 L
1⅓	medium schinek			95.445 L
1⅓	1⅓	small schinek		79.537 5 L
80	60	50	okka	1.590 75 L

Other reported measures:

- 1 **Kübel** (in general) = 188.566 L;
- 1 **Kübel** (in trade with “Knopper” (bile for dyeing)) = 184.2 L;
- 1 **Gönczer Fass** (in Zemplín) = 133.336 3 L;
- 1 **Metzen** (for oats in Mosonmagyaróvár after 1670) = 84.238 0 L;
- 1 **Metzen** (in Budapest) = 81.446 402 L;
- 1 **Mura** (in Komáron) = 76.104 L;
- 1 **Metzen** (in Győr, as reported in 1670) = 74.870 833 L;
- 1 **Metzen** (in Mosonmagyaróvár after 1670) = 68.881 166 L;

1 kleiner **Metzen** (in Komáron, as reported in 1670) = 63.420 L;

1 **bécsi mérő** or **Metzen** (Vienna scale) = 61.487 L;

1 **Metzen** (in Sopron, as reported in 1670) = 59.544 333 L;

1 **Metzen** (in Fülegg after 1670) = 58.135 L;

1 **Metzen** (in Egerseg after 1670) = 54.611 666 L.

1 **Metzen** (in Trnau, now part of Slovakia) = 31.815 L;

1 **véka** (for cereals, varied by location) = 12–25 L;

1 **holba väčšia** (in Buda) = 1.749 0744 4 L;

1 **holba menšia** (in Buda) = 848.4 mL.

15.6 Units of Liquid Capacity

Theoretical scale for wine, beer, and other liquids

					Metric
akó					58 L
40	pint				1.45 L
80	2	icce			725 mL
160	4	2	meszely		362.5 mL
320	8	4	2	fél meszely	181.25 mL

Traditional system in present-day Slovakia

		Metric
víko		26.666 272 L
64	žajdlík	416.660 L

Hungarian system, during the early twentieth century

		Metric
magyar akó		54.30 L
64	icce	848.44 mL

For wine in Buda, Ofen, Pest and Raab after 1808

							Metric
boros hordó							80.025 161 6 L
$1\frac{1}{11}$	antal						73.356 398 1 L
$1\frac{1}{21}$	$1\frac{1}{21}$	akó					70.022 016 4 L
$1\frac{1}{2}$	$1\frac{9}{16}$	$1\frac{1}{16}$	czeber^a				53.350 107 7 L
96	88	84	64	icce			833.595 4 mL
192	176	168	128	2	meszely		416.797 7 mL
384	352	336	256	4	2	fél mezely	208.398 9 mL

^a1 **czeber** (for spirits, liquor and wine) = 60 icce

Two reported systems in Debrecen

				Metric	Metric
nagy czeber				85.044 856 L	84.840 000 L
2	kis czeber			42.522 428 L	42.420 000 L
10	5	kanta		8.504 486 L	8.484 000 L
100	50	10	icce	850.449 mL	848.400 mL

In Eger

		Metric
Fass		81.484 8 L
96	Pressburger Halbe	848.80 mL

In Kőszeg

		Metric
Fass		135.808 L
160	Pressburger Halbe	848.80 mL

In Preßburg, present-day Bratislava in Slovakia, before 1807

						Metric
kufe						149.318 4 L
2	antalog					74.659 2 L
$2\frac{3}{4}$	$1\frac{1}{6}$	akó				54.297 6 L
176	88	64	Pressburger Halbe or joze			848.80 mL
352	176	128	2	meszely		424.2 mL
704	352	256	4	2	fél mezely	212.1 mL

In Preßburg, present-day Bratislava in Slovakia, after 1807

		Metric
Weinkufe		133.371 936 L
160	icce	833.574 6 mL

In Bratislava during the early twentieth century

		Metric
pzsonyi akó		50.8 L
60	icce	846.67 mL

In Upper Hungary (now part of Slovakia) and Lower Hungary (now Hungary) during the sixteenth–seventeenth centuries

		Metric	Metric
altes Halbfass		70.736 25 L	45.271 2 L
88	icce	803.821 mL	514.454 mL

In Rijeka, now part of Croatia

		Metric
orna		53.820 L
32	boccali	1.681 875 L

For wine in Gönc, during the early seventeenth century and the late seventeenth century

		Metric	Metric
gönci hordó		352.5 L	201.44 L
2	fél gönci hordó	176.25 L	100.72 L

For wine in Gönc, during the eighteenth century and after 1807

			Metric	Metric
gönci hordó			151.07 L	147.73 L
2½	akó		60.428 L	59.092 L
160	64	icce	944.2 mL	923.3 mL

In the City of Sopron in northwestern Hungary and Sopron County, now part of eastern Austria and northwestern Hungary

				Metric	Metric
soproni hordó^a				106.898 4 L	–
2	akó			53.449 2 L	69.822 4 L
2⅝	1⅙	pesti czeber		–	53.199 3 L
168	84	64	icce	636.3 mL	831.2 mL

^aDuring the early eighteenth century, reported as 930.6 L, and during the late nineteenth century, reported as 105.75 L

In Temešvár, now part of the Czech Republic

				Metric
weiliki akov				42.420 L
1¼ ₂₁		szredni akov		35.649 6 L
1⅞ ₁₆	1⅙		mali akov	27.161 6 L
50	42		32	icce 848.80 mL

Two reported systems in Timișoara, now part of Romania, before 1854

						Metric	Metric
nagy czeber^a						84.44 L	83.349 L
–	akó					62.53 L	63.393 L
–	1 ⁴⁷¹ / ₂₅₀₀	czeber				54.30 L	53.343 L
2	–	1⅞ ₂₅	kis czeber^a			42.42 L	41.674 L
100	76 ³⁶ / ₆₂₅	64	50	icce^b		848.44 mL	833.488 mL
200	–	128	100	2	honogroi	424.22 mL	416.744 mL

^aThe czeber has also been reported by western scholars as **cseber**, **tscheber** and **tseber**

^bAlso reported as 846 mL

For wine in the Tokaj-Hegyalja region during the early eighteenth century, before 1807 and after 1807

			Metric	Metric	Metric
hordó			134.29 L	157.07 L	147.73 L
2	antal		67.145 L	78.535 L	73.865 L
176	88	icce	763.0 mL	892.4 mL	839.4 mL

Scale for wine from the Tokaj-Hegyalja region during the late nineteenth century in Upper Hungary, based on [ROTT] and [WAGN2], and in Upper Hungary, based on [MART3]; Parisian scale or Lower Hungary scale for wine from Tokaj, based on [HEIN3, p. 338]

							Metric	Metric	Metric
antalka or barrik							220.037 L	223.977 60 L	151.629 L
1½	hordó						146.691 L	149.318 40 L	101.086 L
3	2	antal					73.345 6 L	74.659 20 L	50.543 L ^a
4⅞	2¾	1⅞	czeber^b				53.342 L	54.297 60 L	36.759 L
26⅞	17⅞	8⅞	6⅞	kanta			8.335 L	8.484 L	5.743 L

(continued)

									Metric	Metric	Metric
132	88	44	32	5	pint				1.667 L	1.696 8 L	1.149 L
264	176	88	64	10	2	icce			833.47 mL	848.40 mL	574.35 mL
528	352	176	128	20	4	2	meszely		416.74 mL	424.20 mL	287.18 mL
1056	704	352	256	40	8	4	2	fél meszely	208.68 mL	212.10 mL	143.59 mL

^a=2548 Paris pied cube

^bFor brandy = 60 icce = 50.904 L

In Vasvár

		Metric
veder		44.116 8 L
52	icce	848.40 mL

Other reported measures:

- 1 **ászok hordó** (varying by location) = 1000–5000 L;
- 1 **barrik hordó** (varying by location) = 225–930 L;
- 1 **gönci hordó** (varying by location) = 240–420 icce = 200–452 L;
- 1 **tokaji hordó** (varying by location) = 160–180 icce = 135–151 L;
- 1 **normál boros hordó** (varying by location) = 50–100 L;
- 1 **barilla** (by the sea coast) = 1½ czeber = 81.446 4 L;
- 1 **czeber** (in Preßburg, present-day Bratislava in Slovakia) = 53.348 8 L (before 1853) and 54.136 998 L (after 1853);
- 1 **fertály** = 14 L;
- 1 **köböl** (for wine, varying by location) = 10–25 L;
- 1 **vödör** (varying by location) = 10–15 L;
- 1 **dézsá** (varying by location) = 10–48 icce = 8–38 L;

1 **czeber** (varying by location) = 33, 36, 40, 50 or 60 icce = 5–200 L;

1 **kanta** = 800 mL;

1 **meszely** (varying by location) = 350–400 mL;

1 **Halbe** (for spirits in Spiš, now part of Slovakia) = 1.060 5 L;

1 **fél meszely** (varying by location) = 170–200 mL.

15.7 Units of Weight

Various measures reported during the fourteenth–seventeenth centuries:

1 **térfogatsúly** (as reported in 1579) = 75 kg/hL (for wheat), 68 kg/hL (for rye), 56 kg/hL (for barley) and 42 kg/hL (for oats).

1 **oka** (at Győr, as reported in 1692) = 1.260 141 7 kg;

1 **font** (in Buda during the fifteenth century) = 526.535 41 g;

1 **nehezék** (first reported in 1344) = 350 g (Vienna scale), 300–380 g (in Buda), 350 g (in Preßburg) and 320 g (Spanish scale).

For hay and grain in 1716 and 1723

		Metric
petrence		80–100 kg
20 or 30	villahegy	3–5 kg

One reported approximate upper scale for cereals during the early nineteenth century

							Metric
asztag							~9000 kg
10	kepe						~900 kg
20	2	kalangya					~450 kg
40	4	2	kereszt				~225 kg
120	12	6	3	kötés			~75 kg
600	60	30	15	5	kéve		~15 kg
1200	120	60	30	10	2	marok	~7½ kg

Vienna-linked system in Pest during the late nineteenth century

				Metric
last				22,402.400 kg
20	tonna			1120.120 kg
400	20	quintale		56.006 kg
40,000	2000	100	libbre	560.060 g

Hungarian system (theoretical scale) in Preßburg and metric-linked system in 1852

									Metric	Metric
mázsa^a									56 kg	50 kg
2	kila								28 kg	25 kg
32	16	lót							17.5 kg	
40	20	1¼	oka						1.4 kg	–
100	50	3⅞	2½	font					560 g	500 g
128	64	4	3⅝	1⅞	kventlík				437.5 g	
800	400	25	20	8	6¼	ferto			70 g	–
1600	800	50	40	16	12½	2	nehezék		35 g	–
3200	1600	100	80	32	25	4	2	lat	17.5 g	–

^a1 bécsi mázsa = 56.006 kg, and 1 vám mázsa = 50 kg

			Metric
viedenská hrivna			280.670 4 g
1⅓	spišská hrivna		210.460 96 g
48	36	pizet	5.847 3 g

Other measures reported during the eighteenth–nineteenth centuries:

- 1 **asztag** (for hay stored outdoors) = 10–400 kepe = 5000–36,000 kg;
- 1 **kepe** (for hay) = 50–60 kéve = 500–900 kg;
- 1 **kalangya** (for hay) = 16–60 kéve = 160–900 kg;
- 1 **kereszt** (for hay) = 15–20 kéve = 150–300 kg;
- 1 **bácsi kila** (for grain) = 3 pozsonyi mérő = 140 kg;
- 1 **kötés** (for flax) = [something missing?]
- 1 **köböl** (for grain) = 50–90 kg;
- 1 **mérő** (for grain) = 40 kg;
- 1 **szapu** (for grain) = 25–50 kg;
- 1 **véka** (for wheat) = 15–25 kg;
- 1 **font** (Austro-Hungarian scale) = 560 g;
- 1 **Pfund** (in Kremnica) = 506.585 g;
- 1 **Pfund** (in Preßburg, present-day Bratislava in Slovakia) = 490.053 g;
- 1 **font** (in Buda during the late eighteenth century) = 479.7 g.

Metric-linked system during the early twentieth century

					Metric
vagon					10,000 kg
10	tona				1000 kg
100	10	mázsa or métermázsa			100 kg
200	20	2	colný cent		50 kg
600	60	6	3	colný lót	16.666 kg

In Budapest

				Metric
font				491.6 g
16	oncia			30.725 g
32	2	lot		15.362 g

In present-day Slovakia during the early eighteenth century

					Metric
centár					58.92 kg
120	funt budínsky				491 g
1920	16	uncia			30.687 5 g
3840	32	2	lót		15.343 75 g
15,360	128	8	4	kvintel	3.835 937 5 g

Vienna-linked system in present-day Slovakia during the early nineteenth century

				Metric
viedenský cent				56.006 kg
100	viedenský funt			560.06 g
3200	32	viedenský lôt		17.502 g
12,800	128	4	viedenský kventlik	4.375 g

For mining industry in present-day Slovakia during the late nineteenth century

		Metric
banský cent		59.92 kg
100	banský funt	599.2 g

In Venetian Slovenia and at Timișoara, now part of Romania, during the late nineteenth century

					Metric	Metric
nagy schinek					100.810 800 kg	100.811 336 kg
1½	közel schinek				75.608 100 kg	75.608 502 kg
1½	1½	kis schinek			63.006 750 kg	63.007 085 kg
80	60	50	ocka		1.260 135 kg	1.260 142 kg
32,000	24,000	20,000	400	dráma	3.150 g	3.150 g

16 Principality of Hutt River [Formerly: Hutt River Province]

This is a micro-nation in Australia that claims to be an independent sovereign state. It achieved legal status on April 21, 1972.

16.1 Currency

1970–: 1 Hutt River dollar (= 1 Australian dollar) = 100 cents

the island between 1940 and 1944. In 1944, Iceland gained its independence.

As the Hamburgers were among the first to establish trade with Iceland, several units of measurement used during the seventeenth and eighteenth centuries were based on the standard measures of Hamburg. The metric system has been official since 1900, was legally introduced on November 16, 1907, and has been compulsory since December 30, 1909.

Main sources: [BRUU], [BÖDV], [CARD], [GEST], [GUÐM], [GUNN], [HORR], [JENS], [JÓNS], [LÁRU], [MAGN2], [MART3], [ÓLSE], [SAEM], [STEI2], [UN55], and [UN66]

17 Iceland

See also *Denmark and Norway*.

Iceland was an independent republic from 930 until 1262 when it fell under Norwegian rule. Norway and Iceland were included in a union with Denmark from 1397. Iceland obtained its own constitution in 1874, and gained autonomy in 1918, though it remained nominally under the Danish monarchy. The Allies occupied

17.1 Currency

1918–: 1 Icelandic króna = 100 aurar
 1873–1918: 1 Danish krone = 100 øre
 1815–1873: 1 rigsbank daler = 96 rigsbank skillings
 1700s–1813: 1 ducat = 2 speciedaler = 3 krone = 12 mark = 192 skilling
 1618–1700s: 1 krone = 8 mark = 128 skilling

17.2 Units of Quantity

For lettuce heads, eggs, bricks, herring, hay bales, and baking stones

Púsund stórt								1200
1½	Púsund							1000
10	8½	hundrað stórt						120
12	10	1½	hundrað smátt					100
15	12½	1½	1¼	oel				80
20	16⅔	2	1⅓	1⅓	skok			60
60	50	6	5	4	3	snees		20
120	100	12	10	8	6	2	turgur	10

For books

trave		20
20	neg	1

For buttons

stórtlyft or gros		144
12	tylft or dusin	12

For writing paper and printing paper

balle			4800	5000
10	hrís		480	500
200	20	bæker	24	25

- Some other reported measures:
- 1 **varningslest** (for baking stones) = 1750;
 - 1 **varningslest** (for mats) = 16 bundles = 160;
 - 1 **varningslest** (for canvas) = 32 strings = 64;
 - 1 **tylf** (for tables) = 12;
 - 1 **degger** (for leather) = 10 hides;
 - 1 **varningslest** (for horses) = 1 horse.

17.3 Units of Length

Traditional measure:

- 1 **öln** or **alin** = the span between the elbow and the tip of the fingers.

Presumed system during the ninth century

			Metric
lögalin or Pumalin			474 mm
2	fet		237 mm
20	10	Pumlungur	23.7 mm

During the tenth–eleventh centuries

			Metric
lovalen or Pumalin			491.43 mm
2	fet		245.71 mm
20	10	Pumlungur	24.57 mm

During the eleventh–twelfth centuries

			Metric
alin			512.08 mm
2	fet		256.04 mm
24	12	Pumlungur	21.34 mm

During the late twelfth or early thirteenth century

			Metric
stiku			982.86 mm
2	lovalen or Pumalin		491.43 mm
4	2	fet	245.71 mm
48	24	12	Pumlungur 20.48 mm

Hamburger-linked system during the sixteenth century

			Metric
hamborgaralin			572.790 mm
2	fet		286.395 mm
22	11	Pumlungur	26.036 mm

During the seventeenth–eighteenth centuries

			Metric
verzlunar alin^a			570.64 mm
2	fet		285.32 mm
24	12	Pumlungur	23.78 mm

^a = 21⅓₁₁ dönsk Pumlungur = 10/11 dönsk alin

During the early eighteenth century, based on [LÁRU]

								Metric
málfaðmur^a								1.946 m
2	stig							973 mm
3½	1¼	alin						556 mm
7	3½	2	fet					278 mm
21	10½	6	3	lófi				92.67 mm
42	21	12	6	2	reisiÞumlungur			46.33 mm
84	42	24	12	4	2	finger		23.17 mm
252	126	72	36	12	6	3	byggkorn	7.72 mm

^a1 **málfaðmur** (as reported by [BÖÐV]) = 1.950 m

Danish-linked system after May 31, 1776, based on [GUÐM]

									Metric	
Þingmannaleið ^a									37,662 m	
5	dönsk míla ^b								7532.40 m	
5 ^{1595/23681}	1 ^{319/23681}	jarðmálsmíla ^c							7432.28 m	
10,000	2000	1 973½ ₁₂	mælistkapt						3.766 2 m	
20,000	4000	3946%	2	faðmur					1.883 1 m	
60,000	12,000	11,840½	6	3	dönsk alin				627.70 mm	
120,000	24,000	23,681	12	6	2	fet			313.85 mm	
240,000	48,000	47,362	24	12	4	2	kvartil		156.925 mm	
1,440,000	288,000	284,172	144	72	24	12	6	Pumlungur ^d	26.154 mm	
17,280,000	3,456,000	3,410,064	1728	864	288	144	72	12	línur ^e	2.179 mm

^aIn 1875, the *Almanak hins íslenska Þjóðvinafélags* reported it as 5 þýzkar mílur

^b[JENS] used a dönsk mil = about 7408 m

^cAlso called **jarðmælingarmílur**. According to [SAEM, p. 25], 1 Þingmannaleið = 5 jarðmálsmíla

^dDuring the late nineteenth century, also reported, usually as 1 **tomma**, equal to 1 Imperial inch = 25.4 mm

^eAlso called **strá**

Danish-linked system in Reykjavík during the early nineteenth century, based on [MART3]

						Metric
hundrede						68.477 127 m
40	faðmur					1.711 928 m
120	3	alin				570.643 mm
218⅔ ₁₁	5⅔ ₁₁	1⅔ ₁₁	fet			313.853 mm
2 618⅔ ₁₁	65⅔ ₁₁	12⅔ ₁₁	12	tomma		26.154 mm
31,418⅔ ₁₁	461⅔ ₁₁	153⅔ ₁₁	144	12	línur	2.179 mm

For maritime use, based on [LÁRU]

					Metric
tylft					99,600 m
4	Þingmannaleið				24,900 m
12	3	vika sjávar^a, dönsk míla, or Þýzk míla			8300 m
16	4	1⅓	míla		6225 m
60,000	15,000	5000	3750	málfaðmar	1 ^{33/50}

^a**Vika sjávar** was first reported as varying between 7.5 and 9 km. From the late eighteenth century, it was usually reported as 8.3 km

Other reported measures:

1 **miil** = 12,346.735 802 m;

1 **sjómíla** or **sómí** = 1855 m.

17.4 Units of Area

System based on the stytttri alín

		ferfaðmur	Metric
stakksvöllur		6400 (=80 × 80 faðmar)	15,670 m ²
6	eyrisvöllur	1 066 ² / ₃	2612 m ²

System based on the lengri alín

				ferfaðmur	Metric
stakksvöllur				5400	20,454 m ²
1 ¹³ / ₁₇₆	lögvollur ^a			5 028 ² / ₇	19,047.1 m ²
4	3 ²⁸³ / ₇₃₇₅	kýrfóðursvöllur		1350	5113.5 m ²
6	5 ⁷⁹ / ₁₂₅	1½	eyrisvöllur ^b	900 (30 × 30 faðmar)	3409 m ²

^aAlso called **alvöllur**

^bAlso called **dagsláttá**

Danish-linked system (Hartkorns maal) for agricultural land; traditional system, for rye-land, for building land, and for oat-land

				Metric	Metric	Metric	Metric
tunna ^a				22,064.406 m ²	17,336.319 m ²	15,760.290 m ²	12,608.232 m ²
8	skeppa			2758.051 m ²	2167.040 m ²	1970.036 m ²	1576.029 m ²
32	4	fjórðungsker		689.513 m ²	541.760 m ²	492.509 m ²	394.007 m ²
96	12	3	tóltfugar or album	229.838 m ²	180.587 m ²	164.170 m ²	131.336 m ²

^aIn general = 14,000 ferhyrndur alín, for rye land = 11,000 ferhyrndur alín, for building land = 10,000 ferhyrndur alín, and for oat-land = 8000 ferhyrndur alín

For cultivated land areas

						ferhyrndur alín	Metric
stakksengi ^a						60,750	95,743.761 m ²
1¼	vikuverk ^b					48,600	76,595.009 m ²
2½	2	kýrkvöllur ^c				24,300	38,297.50 m ²
6 ² / ₆₄	5 ¹ / ₁₆	2 ¹⁷ / ₃₂	eyrisvöllur ^d			9600	15,129.87 m ²
7½	6	3	1 ³ / ₂₇	dagsláttá ^c		8100	12,765.83 m ²
105 ¹⁵ / ₃₂	84 ³ / ₈	42 ³ / ₁₆	16 ² / ₃	14 ¹ / ₁₆	fjórðungsland	576	907.79 m ²

^aThe meadow area that provides a stack of hay

^bOriginally, it was an approximation of the amount of land that could be cultivated in 1 week

^cThe land area that provides fodder for one cow. [BÖÐV] reported 1 **kýrkóðurvöllur** = 5224 m², and [LÁRU] reported 1 **kýrkóðurvöllur** = 1½ eyrisvöllur = 14,400 ferhyrndur alín = about 22,694.80 m²

^dThe land area that you were paid 1 øre to cultivate

^eOriginally, it was an approximation of the amount of land that could be cultivated in 1 day. Reported to equal 30 × 30 faðmar = 900 ferhyrndur faðmar. 1 **engjadagsláttá** (for meadows; originally, an approximation of the amount of meadow that could be mowed in 1 day) = 40 × 40 faðmar = 14,400 ferhyrndur faðmar

For land areas, based on [LÁRU]

			málfaðmar	Metric
sældingsland			$3 \times 16 \times 16$	20.4 ar
3	mælisland		16×16	6.8 ar
12	4	fjórðungsland	8×8	1.7 ar

Danish-linked system after May 31, 1776

				Metric
fermíla				51,063 344.784 m ²
16,000	vallardagsláttá			3191.459 049 m ²
14,400,000	900	ferfaðmur		3.546 065 61 m ²
129,600,000	8100	9	feralin	39.400 729 dm ²

During the late eighteenth century, based on [GUÐM]

					Metric
ferhyrndur faðmar					14.184 262 m ²
9	ferhyrndur alín				1.576 029 m ²
36	4	ferhyrndur fet			39.400 7 dm ²
5184	576	144	ferhyrndur Pumlungur		27.36 cm ²
746,496	82,944	20,736	144	ferhyrndur lína	19.0 mm ²

System reported during the late nineteenth century, based on [CARD]

							Metric
fermíla or fermílla							56,739.580 674 56 m ²
10	engjateigur or engjadagsláttá^a						5673.958 067 456 m ²
17 ⅔	1⅔	tundagsláttá					3191.601 412 944 m ²
16,000	1600	900	ferfaðmur				3.546 223 792 16 m ²
144,000	14,400	8100	9	feralin			39.402 486 579 6 dm ²
576,000	57,600	32,400	36	4	ferfet		985.062 164 49 cm ²
82,944,000	8,294,400	4,665,600	5184	576	144	ferPumlungur	6.840 709 48 cm ²

^a1 **engjateigur** was sometimes reported as 1 **tundagsláttá** = 3191 m²

17.5 Units of Volume

Until the early nineteenth century

					fjórðungar	merkur	Metric
mælishlass^a					288	5760	11.0 m ³
1½	málfaðmar^b				192	3840	7.3 m ³
9	6	málbandsklyfjar^c			32	640	1.2 m ³
24	16	2⅔	lögklyf		12	240	458.3 dm ³
288	192	32	12	málvönull	1	20	38.2 dm ³

^a=4 × 4 × 4 álnir = 36 vættir = 64 rúmlestir

^b=3½ × 3½ × 3½ alín = 42,875 rúmálnir

^c=4 vættir = 16 fjórðungshestar í klyf

During the early nineteenth century

					Metric
teningsfaðmur or brennifaðmur					2.224 8 m ³
9	teningsalín				247.2 dm ³
72	8	teningsfet			30.9 dm ³
576	64	8	teningskvartil		3.86 dm ³
41,472	4608	576	72	teningsPumlungur	53.6 cm ³

For bricks

					Metric
faðmur					6.677 6 m ³
27	álnir				247.318 dm ³
216	8	fet			30.915 dm ³
1728	64	8	kvartil		3.864 dm ³
373,248	13,824	1728	216	Pumlungur	17.890 cm ³

For hay

			Volume	Metric	Weight	Metric
málfaðmur or mælihllass			3 kassalaga álnir	742 dm ³	28 vættir	1107.456 kg
7	málbandshestar		–	106 dm ³	4 vættir	158.208 kg
14	2	fjórdungabaggar	–	53 dm ³	2 vættir	79.104 kg

Other measures reported during the nineteenth century:

1 **varningslest** (for timber) = 2 faðmar of logs that are 1¼ álnar long;

1 **varningslest** (for pine trees) = 100 teningsfet = 3.09 m³;

1 **varningslest** (for oaks) = 80 teningsfet = 2.472 m³.

17.6 Units of Dry Capacity

Containers and vessels for various commodities

				merkur vegnar	Metric
búskjóla				30	6.448 L
1½	katlamálsskjóla or björgvínaraskur			20	4.299 L
4	2⅔	karlaskur		7½	1.612 L
6	4	1½	kvenaskur	5	1.074 7 L

Containers and vessels for various commodities

					merkur mælder	Metric
búskjóla					36	9.288 L
1½	katlamálsskjóla or björgvínaraskur				24	6.192 L
4	2⅔	karlaskur			9	2.322 L
6	4	1½	kvenaskur		6	1.548 L
6	4	1½	1	bolli^a	6	1.548 L
24	16	6	4	4	jústa 1½	387 mL

^aA cup

Danish-linked system in Reykjavík during the early nineteenth century, based on [MART3]

					Metric
tunna or tönde					131.392 283 L
4	fjórðungur or fjerdingskar				32.848 071 L
8	2	áttungur or ottingkar			16.424 035 L
16	4	2	hálfáttungur or sextingkar		8.212 018 L
136	34	17	8½	pottur or pott	966.120 mL

During the nineteenth century, based on [CARD]

								Metric
korntunna								139.125 891 L
1½	öltunna							131.396 675 L
1½	1 ²⁶ / ₁₉₅	almenn turma						115.938 243 L
1¾	1 ³⁹ / ₁₈₂	1¼	síldartunna ^a					108.209 029 L
3⅓	3 ¹⁹ / ₃₉	3⅓	2¾/39	anker				37.679 929 9 L
4½	4¼	3¾	3½	1⅞	fet ³			30.916 865 568 L
8	7⅞	6⅞	6⅞	2⅞	1⅞	kornskeppe		17.390 736 882 L
144	136	120	112	39	32	18	pottur	966.152 049 mL

^aAccording to [STEI2, p. 13], the unit was used in the herring trade

For bacon, butter, corn, cumin, fruit, herring, lime, meat, and salt from France

								Metric
lest ^a								1669.507 L
12	tunna							139.126 L
96	8	skeppa						17.391 L
384	32	4	fjórðök					4.348 L
768	64	8	2	áttungur				2.174 L
1536	128	16	4	2	hálfáttungur			1.087 L
1728	144	18	4½	2¼	1⅞	pottur		966.15 mL
6912	576	72	18	9	4½	4	pelar	241.54 mL

^a1 kornlest (for export) = 22 tunnur = 3060.772 L

For grain

				merkur vegnar	merkur mældar	Metric	Metric
sáld				480	576	102.90 kg	123.42 L
2	sældingur			240	288	51.45 kg	61.71 L
6	3	mælir		80	96	17.15 kg	20.57 L
24	12	4	fjórðungur	20	24	4.287 kg	5.142 L

For coal and bark

				Metric
lest				3059.10 L
18	tunna			169.95 L
99	5½	teningsfet		30.90 L
180	10	1⅞	skeppa	16.995 L

For salt from Spain

				Metric
lest				3060.763 L
18	tunna			170.042 L
144	8	skeppa		21.255 L
3168	176	22	pottur	966.15 mL

Other measures reported during the nineteenth–twentieth centuries:

- 1 **varningslest** (for corn) = 26 tunnur = 3617.276 L;
 1 **varningslest** (for salt and coal) = 20 tunnur = 2782.520 L;
 1 **varningslest** (for flax and tar) = 18 tunnur = 2504.268 L;
 1 **varningslest** (for salted fish) = 18 skeppur = 313.038 L;

1 **varningslest** (for fish) = 15 skeppur = 260.865 L;

1 **varningslest** (for linen) = 10 skeppur = 173.910 L;

1 **varningslest** (for grapes) = 80 heilar krukur (jars) and 120 hálfar krukur (half jars);

1 **síldarmál** (for herring) = 150 L;

1 **síldartunna** (for herring, as reported in [UN66]) = 118–120 L.

17.7 Units of Liquid Capacity

Traditional system

						Metric
tunna						~116 L
2	stampur					~58 L
4	2	kvartil				~29 L
8	4	2	áttungur			~14.5 L
10	5	2½	1¼	pundkeröld		~11.6 L
240	120	60	30	24	merkur	~0.48 L

Danish-linked system in Reykjavík during the early nineteenth century, based on [MART3]

				Metric
kutting				4.830 599 L
2½	kanna			1.932 239 L
5	2	pottur		966.120 mL
20	8	4	pelí	241.322 mL

During the nineteenth century, based on [STEI2]

											Metric
fat											927.475 L
4	uxahöfuð^a										231.869 L
8	2	tunna									115.934 L
24	6	3	ánker								38.645 L
32	8	4	1½	kvartil							28.984 L
48	12	6	2	1½	hálfánker						19.322 L
120	30	15	5	3¾	2½	kútur^b					7.729 L
480	120	60	20	15	10	4	kanna				1.932 L
960	240	120	40	30	20	8	2	pottur			966.12 mL
1280	320	160	53⅓	40	26⅔	10⅔	2⅔	1⅓	flaska		724.59 mL
1920	480	240	80	60	40	16	4	2	1½	merkur	483.1 mL
3840	960	480	160	120	80	32	8	4	3	2	pelí 241.5 mL

^aFor wine and brandy

^bIn some areas, also reported as 5 pottur = 4.830 6 L

For beer, olive oil, spirits, and vinegar, based on [GUÐM]

							Metric
tunna							139.05 L
2	hálf tunna						69.525 L
4	2	tunnufjórð					34.762 L
8	4	2	ánger				17.381 L
16	8	4	2	hálf ánger			8.691 L
136	68	34	17	8½	pottur		1.022 L
544	272	136	68	34	4	pelí	255.6 mL

For oil and tar, based on [GUÐM]

			Metric
tunna			122.64 L
4	tunnufjórð		30.66 L
120	30	pottur	1.022 L

For wine, rum and arak, based on [GUÐM]

												Metric
stykfad												1226.40 L
1¼	fat^a											981.12 L
2½	2	pípa										490.56 L
5	4	2	uxahöfuð									245.28 L
7½	6	3	1½	áma or tjerce								163.52 L
30	24	12	6	4	ánger							40.88 L
150	120	60	30	20	5	kútur						8.176 L
300	240	120	60	40	10	2	stöbken					4.088 L
600	480	240	120	80	20	4	2	kanna				2.044 L
1200	960	480	240	160	40	8	4	2	pottur			1.022 L
2400	1920	960	480	320	80	16	8	4	2	mörk		511.2 mL
4800	3840	1920	960	640	160	32	16	8	4	2	pelí	255.6 mL

^aOne fat has also been reported as 936 pottar = 956.592 L

Other reported measures:

- 1 **lysístunna** or **brennivínstunna** (for tar or spirits) = 120, 121 or 122 pottar = 122.64, 123.66 or 124.68 L. (Hið íslenska bókmenntafélag. *Tíðindi um stjórnmálefni*

Íslands/gefn út af hinu Íslenska Bókmentafélagi, Vol. 3. Kaupmannahöfn, S. L. Möller, 1864, p. 591).

17.8 Units of Weight

For grain and milled flour during the fourteenth century

								Metric	Metric
áhöfn								14,813.798 4 kg	17,776.281 6 kg
12	lest							1234.483 2 kg	1481.356 8 kg
120	10	skippund						123.448 32 kg	148.135 68 kg
2880	240	24	(lísi)pund					5.143 68 kg	6.172 32 kg
69,120	5760	576	24	mörk				214.32 g	257.18 g
552,960	46,080	4608	192	8	eyrir			26.79 g	32.147 g
1,658,880	138,240	13,824	576	24	3	örtugur		8.93 g	10.715 8 g
33,177,600	2,764,800	276,480	11,520	480	60	20	peningur	446.5 mg	535.8 mg

Commercial weights during the eighteenth–nineteenth centuries

									Metric
skippund									158.208 kg
3½	centner								49.440 kg
4	1¼	vætt							39.552 kg
20	6¼	5	lísipund						7.910 4 kg
32	10	8	1⅓	fjórðung					4.944 kg
320	100	80	16	10	pund				494.40 g
640	200	160	32	20	2	mörk			247.20 g
10,240	3200	2560	512	320	32	16	lóð		15.45 g
40,960	12,800	10,240	2048	1280	128	64	4	kvintin	3.86 g

Some other measures reported before the eighteenth century:

1 **hestburður** = the amount of dry hay one horse could carry comfortably = about 100 kg.

When the hay had been placed on the horses, the horses were tied to one another. They formed

a long row of horses, a so-called heybandslest. Horses that were used for long journeys would often carry much heavier loads than the ordinary horses were made to carry. It was common for them to carry about 150 kg on their backs. If the horse was linked to a tractor-trailer, it could draw about 300 kg.

1 **bagga** = a bale of hay = about 50 kg.

Danish system in Reykjavík during the early nineteenth century, based on [MART3]

												Metric
læst												2596.406 800 kg
16¼	skippund											159.778 880 kg
52	3½	centner										49.930 900 kg
65	4	1¼	pottur									39.944 720 kg
325	20	6¼	5	lísipund								7.988 944 kg
520	32	10	8	1⅓	fjórðung							4.993 090 kg
2600	160	50	40	8	5	mark						998.618 g
5200	320	100	80	16	10	2	pund					499.309 g
83,200	5120	1600	1280	256	160	32	16	unze				31.207 g
166,400	10,240	3200	2560	512	320	64	32	2	lóð			15.603 g
665,600	40,960	12,800	10,240	2048	1280	256	128	8	4	kvintin		3.901 g
2,662,400	163,840	51,200	40,960	8192	5120	1024	512	32	16	4	ort	975 mg

For linen and wool

					Metric
skippund^a					158.208 kg
–	skippund^b				79.104 kg
16	–	steen^a			9.888 kg
–	16	–	steen^b		4.944 kg
–	160	20	10	pund	494.40 g

^aFor linen

^bFor wool

For butter, fish, flour, meat, soap, and tallow

					lísipund	Metric
tunna					14	110.745 6 kg
2	hálf tunna				7	55.372 8 kg
4	2	kvartil			3½	27.686 4 kg
8	4	2	áttungur		1¾	13.843 2 kg
16	8	4	2	hálfáttungur	7/8	6.921 6 kg

For silver

							Metric
pund							494.40 g
2	mörk						247.20 g
16	8	únsía					30.90 g
32	16	2	lóð				15.45 g
128	64	8	4	kvintín			3.862 g
512	256	32	16	4	ort		965.6 mg
576	288	36	18	4½	1⅞	green	858.3 mg

For gold

						Metric
pund						494.40 g
2	mörk					247.20 g
32	16	lóð				15.45 g
48	24	1½	karat			10.30 g
192	96	6	4	gran		2.575 g
576	288	18	12	3	green	858.3 mg

For medical use

					Metric
pund					692.16 g
12	únsía				57.68 g
96	8	drakma			7.21 g
288	24	3	skrúpull		2.403 g
5760	480	60	20	gran	120.2 mg

During the mid-nineteenth century:

1 **lysipund** (for fish) = about 5 kg.

Metric-linked system during the early twentieth century (fatmur = 6 fet = fet = m; km; =0.669 m)

							Metric
skipbund or batt							160 kg
1⅔	tunna smjörs						112 kg
5	3½	liesbund					32 kg
8	5⅓	1⅓	fierding				20 kg
40	28	8	5	fisk			4 kg
160	112	32	20	4	mark		1 kg
320	224	64	40	8	2	pund	500 g

18 Idrisid Emirate of Asir

See also *Emirate of Jabal Shammar*, *Mutawakkilite Kingdom of Yemen*, and *North Yemen*.

From 1515 to 1915. Asir was a province of the Ottoman Empire on the Arabian Peninsula. It was established in 1916 after Ali al-Idris began a rebellion against the Ottoman Empire in 1915. Most parts of Asir were annexed piece by piece by the Saudi Arabian Kingdom from 1919 to 1934. The remaining parts of Asir were absorbed by Yemen.

19 Ifni

See *Western Sahara*.

20 Igbo States

See also *Nigeria*.

In present-day Nigeria, there were about 45 independent states until the late eighteenth century.

Before the British system for weights and measures was introduced, measures related to the human body were in general use. The foot print, the length of an average man’s arm from the sternum of the chest to the tip of the middle finger, and the length of a man’s step were all convenient measures when buying cloth, rope and fishing string. Rice was measured by the full palm or by two open palms.

Main source: [OKOR]

Azerbaijan, Georgia, Iraq, Iran, Turkmenistan, Turkey, and some parts of western Pakistan. The Kingdom lasted until 1335, when the area was divided between Chupanids, Eretnids, Injuids, Jalayrids, Mamluks, Muzaffarids, Sarbadars, and Timurids.

Main sources: [PETR3] and [PETR8]

22.1 Units of Area

1 **juft-i gāv**, **juft**, or **faddān** (a unit of taxation of the peasants) = a strip of land for ploughing, which could be worked by one team of oxen in one season = varied by location, but an average would possibly be about 6–7 ha.

21 Il de la Passion

See *Clipperton Island*.

22 Ilkhanate

See also *Afghanistan*, *Azerbaijan*, *Chobanid Sultanate*, *India*, *Jalayirid Sultanate*, *Mamluk Sultanate*, and *Ottoman Empire*.

Ilkhanate was a Mongol khanate founded, in 1256, in what is now Afghanistan, Armenia,

23 Kingdom of Illyria (1816–1849)

See also *Austrian Littoral*, *Dalmatia*, and the *Republic of Ragusa*.

This Kingdom was a crown land of the Austrian Empire, comprising the Duchy of Carinthia, the Duchy of Carniola, the Princely County of Gorizia and Gradisca, Trieste, and the Margraviate of Istria.

23.1 Units of Length

						Metric
hvat						1.896 66 m
1½	korak					1.264 44 m
6	4	stopalo				316.110 95 mm
18	12	3	dlana			105.370 00 mm
72	24	12	4	inča		26.342 56 mm
864	288	144	48	12	linija	2.195 21 mm

Other reported measures:

- 1 **nautička milja** = 1854.965 m;
- 1 **braccio da lana** (for wool) = 683.396 mm;
- 1 **braccio da seta** (for silk) = 638.721 mm.

23.2 Units of Dry Capacity

					Metric
staro					83.317 2 L
3	polonick				27.772 4 L
2	1½	mezzeno			18.514 9 L
4	3	2	quarte		9.257 5 L
8	6	4	2	quartuarola	4.628 7 L

23.3 Units of Liquid Capacity

Old system for wine and spirits

			Metric
barile			66.039 4 L
14	scudele		4.717 1 L
36	2⅔	old boccale	1.834 43 L

New system for wine and spirits

			Metric
orna			56.605 2 L
40	new boccale		1.415 1 L
1600	40	maass	35.38 mL

23.4 Units of Weight

For wholesale

			Metric
migliajo			560.122 kg
10	centinajo		56.012 2 kg
1000	100	funto	560.012 2 g

For fine use in Rijeka

						Metric
marc						238.70 g
8	once					29.837 g
32	4	quarta				7.459 g
192	24	6	denaro			1.243 g
1152	144	36	6	karato		207.2 mg
4608	576	144	24	4	grano	51.80 mg

24 Incan Empire

See also *Peru*.

In 1438, the Kingdom of Cuzco, under the command of Pachacuti (reign: 1438–1471), was transformed into the Incan Empire. The Empire came to incorporate a large part of western South America, but had its administrative, political and military centre located in Cusco, in present-day Peru. The Empire lasted until the Spanish conquest in 1533, led by Francisco Pizarro.

The Incan culture relied more on relative measurements than absolute ones. They used body parts for shorter measures, while longer distances were based on time, e.g., the time it took to walk a certain distance, rather than on a linear measure. It is difficult to find detailed information about the units of measurement used by the Incas before the Europeans arrived.

The official language of the empire was Quechua, although hundreds of local languages were

spoken. The second most dominant language was Aymaran, which shared a large amount of vocabulary with Quechuan.

Main sources: [BAUD], [CIEZ], [LECH], [MEND], [MURÚ], and [ROWE2]

24.1 Currency

They traded various items, such as gold, silver, lamas and cloth. Among themselves, they also traded handcrafted goods, such as pots and ropes. For taxes, the Incas used their crops.

24.2 Units of Length

Quechua system

							Metric
guamanin							~168,000 m
30	tupu^a						~5600 m
100,000	3 333⅓	ricra^b					~1.68 m
200,000	6 666⅔	2	sikya				~840 mm
400,000	13, 333⅓	4	2	cucchuch tupu or rok'ana^c			~420 mm
800,000	26, 666⅔	8	4	2	capa or k'apa^d		~210 mm
933, 333⅓	31, 111⅓	9⅓	4⅓	2⅓	1⅓	yuku or yaku^e	~180 mm

^aAccording to [MURÚ], there was a unit called the **thatki** = 1/6000 tupu = ~930 mm

^bAbout the height of a person

^cProbably equal to the length of a forearm

^dProbably equal to a hand span

^eProbably equal to the length of a finger

Aymara system

								Metric
chuta or sayhua								~16,800 m
2	yapu							~8400 m
10	5	ecca						~1680 m
100	50	10	loca					~168 m
11,200	5600	1120	112	chillque				~1.50 m
80,000	40,000	8000	800	7⅓	chia			~210 mm
93, 333⅓	46, 666⅔	9 333⅓	933⅓	8⅓	1⅓	vicu		~80 mm
200,000	100,000	20,000	2000	17⅓	2½	2⅓	ttkhili^a	~84 mm

^aEqual to the width of the hand, with the fingers together

The Spanish conquistador and chronicler Pedro de Cieza de León (1518–1558) took some notes of units of weights and measures, and assigned them Spanish names.

Some measures based on [CIEZ, p. 476]:

1 **legua** = ~3½ miles;

1 **estado** = ~5½ft.

24.3 Units of Area

Traditional measures:

1 **callapa** (used by the Aymara) = the area of land needed to raise one or two heads of cattle;

1 **tupu** (used by the Quechuas) = the cultivated area of land or pasture needed for a married couple;

1 **hui** (used by the Quechuas) = the area one man could cultivate in one day = about 625 m²;

1 **papacancha** (used by the Quechuas in Cuzco, for cultivation of sweet potatoes, but seldom used) = about 20 20 varas = about 282 m².

Quechua system

				Metric
tupu ^a				~4000 m ²
2	checta			~2000 m ²
4	2	sillcu		~1000 m ²
8	4	2	cutmu	~500 m ²

^aVaried a lot by location and over time, e.g., during the early seventeenth century, as reported by Garcilaso de la Vega, = about 1½ Spanish fanega = 150 × 150 varas = about 15,725 m²; during the mid-nineteenth century, as reported by Marcos Jiménez de la Espada, = 60 × 50 pasos = about 5823 m²; in Urumbamba, as reported in 1595 = 100 × 60 varas = about 4190 m²; and in Cusco, as reported in 1713 = 96 × 48 varas = about 3220 m²

Aymara system

		Approx.. In Spanish scale	Metric
camaña ^a		—	~5618 m ²
2?	ecca	100 × 10 brazas	~2809 m ²

^aThe cultivated area of land or pasture needed for a married couple. Varied by location and over time

24.4 Units of Capacity

The Incan culture used a wide range of measures for grain and other dry commodities, e.g., dried pumpkins, gourds, pots, and a single hand-cupped gowpen to measure small portions.

Quechua system

				Metric
runku or runcu ^a				~18 kg
				~9 kg
2	checta runca			~4½ kg
4	2	cutmu		~2¼ kg
8	4	2	sillcu	~1⅞ kg

^aA broad crate filled with coca or red peppers

Other measures reported as used by the Quechuan people:

1 **ttakhitta** (for starch and corn) = a variable measure;

1 **tanca vicchi** (for starch and corn) = a variable measure;

1 **hacchi** = a handful of something, in one hand.

Aymara system

				Metric
aymura ^a				~28 dm ³
2	kullu ^b			~14 dm ³
4	2	laqui ^c		~7 dm ³
93⅓	46⅔	23⅓	luu ^d , moho , or thokhto	~0.3 dm ³

^aAlso called **yschay pokcha** by the Quechuan people

^bAlso called **pokcha** by the Quechuan people

^cAlso called **patma pokcha** by the Quechuan people

^dEqual to a portion. Also called **poktoy** by the Quechuan people

Some measures based on [CIEZ, p. 476]:

1 **carga** = 3–4 fanegas = 4½–6 bu;

1 **fanega** = ~1½ bu.

24.5 Units of Weight

Many weights, about 30%, that have been found in the Peruvian region are globe-shaped. The weights were made of stone (39%), iron (32%), and lead (24%), with 5% being made of other nonferrous metals.

Traditional system

				Metric
?				23.1 kg
10	?			2.31 kg
100	10	?		231 g
1000	100	10	?	23.1 g

Measures based on [CIEZ, p. 476]:

1 **quintal** = 4 arrobas = 101½ lbs;

1 **arroba** = 25.3 lbs.

25 India

See also *Indus Valley Cultures*, *Ancient Hindu, Buddhist and Jain cultures*, *Maurya Empire*, *Tamilakam*, and *Videha*.

During c.2600–c.1750 BCE, the Indus Valley Civilization flourished in present-day Pakistan and western India. For information about this era, see *Indus Valley Cultures*. From c.1500 BCE until c.400 BCE, most of the Vedas, the old scriptures of Hinduism, were composed. This period is often referred to by scholars as the ancient Hindu period. For information about this period, see *Ancient Hindu, Buddhist and Jain cultures*. During the end of the late Vedic period, c. 600 BCE, large cities flourished in the Gangetic Plains, and most of present-day India was divided into sixteen major oligarchies and kingdoms (*mahajanapadas*). In the third century BC, most of South Asia was united into the Maurya Empire (322–185 BCE). For information about this period, see *Maurya Empire*. The Gupta dynasty covered much of the Indian subcontinent from c. 320 to c. 550. Later, the southern parts of the country were ruled by the Chalukyas (between the sixth and twelfth centuries), the Cholas (between the third and twelfth centuries) and the Vijayanagara Empire (1336–1646). Following invasions from Central Asia between the tenth and twelfth centuries, much of North India came under the rule of the Delhi Sultanate and later the Mughal Empire, which, at its height, united most of present-day India. During the late sixteenth century, a powerful sultanate, under the name of Golkonda, was established in east and central Deccan. At the same time, a Kingdom of the southern Deccan, Bijapur, was a leading Indian state. From the sixteenth century onward, European powers such as Portugal, the Netherlands, France, and the United Kingdom established colonies in the country. An Indian nation cannot be said to have existed until the subcontinent was united under British rule in the mid-nineteenth century. By 1858, most of India was under the control of the British East India Company. During the British Raj (1858–1947), there were regions under British control, commonly called British India, as well as princely

states ruled by individual rulers under the paramountcy of the British Crown. In 1947, there were 565 princely states, but only four major Princely States had direct political relations with the Central Government in India, namely Hyderabad, Mysore, Baroda, and Kashmir and Jammu. India became independent in 1947.

A certain degree of standardization of weights and measures can be detected, even for the earliest dynasties. During the Greco-Bactrian kingdom (256–125 BCE) and the Indo-Greek Kingdom (180 BCE–10 CE), some ancient Greece weights were introduced. During the Timurid dynasty (1370–1526), weights and measure systems varied from region to region, commodity to commodity, and between rural and urban areas.

At any rate, there were three kinds of weight in use throughout the time leading up to present-day India; the first was for weighing bulky commodities such as cereals, the second was for drugs, gold and silver, and the third was for pearls and precious stones.

The lengths were generally based on the proportions of the human body, such as the length of arms and width of fingers, and the weights were based on the weight of various seeds, such as the wheat berry and ratti. These systems of weights and measures are only partially known; they can only be estimated retrospectively and described with any degree of accuracy where Europeans established settlements from the late sixteenth century. The third Mughal Emperor, Akbar the Great, realized the need for a uniform system. He decided to use barley grain as a yardstick and as a unit for weighing. Unfortunately, this system only replaced the existing systems to a partial degree. Instead, it ended up adding another system. As the British traders entered India, they accepted barley grain as a unit for weighing gold and minted coins, using wheat berry as the standard weight. Eventually, British traders also introduced their own systems of weights and measures. Together with some standard national systems in force throughout India, the systems used in the Mughal Empire, the Bengal Presidency, the Bombay Presidency, the Madras Presidency, and Calcutta are presented below, as well

as some examples of scales used during the nineteenth century.

The metric system for weights and measures has been optional since 1912. In 1939, the Government of India passed the Standards of Weights Act, which allowed the tola/seer/maund-system to coexist with the British systems. This standard came into effect in 1942. In 1941, the Punjab Weight and Measures Act provided a sense of uniformity. In 1956, the Government of India enacted the Standards of Weights and Measures Act, which introduced the metric system based on the Punjab Act in October 1958. It also stated that metric weights would be mandatory by October 1960, and metric measures mandatory by April 1962. At this time, there were at least 120 different types of *seer*, with different values, in use. In April 1963, all non-metric units were declared illegal.

Main sources: [CARR2], [ELLI2], [GOVE], [JERV], [KELL], [MART], [MART3], [PRIN], [ROCH], and [SALE3]

25.1 Currency

1964–:	1 Indian rupee = 100 paise
1957–1964:	1 Indian rupee = 100 naya paise
c.1858–1957:	1 Indian rupee = 16 annas = 64 pice = 192 pies

25.1.1 Portuguese India

1961–:	1 Indian rupee = 100 paise
1958–1961:	1 Portuguese Indian escudo = 100 centavos
1871–1958:	1 Portuguese Indian rupia = 16 tangas = 960 réis
–1871:	1 Portuguese Indian rupia = 10 tangas = 20 pardaús = 600 réis = 750 bazarucos 1 xerafim = 2 rupias

25.2 Units of Quantity

Some often reported measures:

- 1 **lack** = 100,000;
- 1 **corge** or **koorje** (for tobacco) = 40;
- 1 **corge** or **koorje** (for general use) = 4 gundas = 20;
- 1 **gunda** = 5.

25.3 Units of Length

It may be concluded, according to [SALE3], that land areas must have been surveyed and demarcated with a rod in the Vedic time (c.2500–800 BCE).

There is plentiful evidence suggesting that the system of measuring land was well-known during the sixth century BCE. [SALE3] presumes there was a connection between the land area and the harvest, measured according to the drone unit.

The usage of surveying and measuring land continued up to the fourth century BCE. There was also a measure of distance, probably the *krōsa* or *kōsa*, equal to ten stadia.

Based on Kautilya, *Artha*. Bk IV, ch. I, p. 229, text p. 202:

The following linear measures were used: *kamsa*, *aṅgula*, *daṇḍa*, *rajjū*, *aratni*, *dhanus*, *gōruta*. Other measures mentioned: *paridēsa*, *bāhu*, *vitasti* or *chhāyāpauruṣa* *gōruta*, and *yōjana*. He also mentioned a *pāda*, which was equal to 14 *aṅgulas*, and a *nāḷika*.

Kautilya also measured roads by *danda*:

Royal roads (*rajamarga*) were paths meant for elephants (*hastimārga*), cremation ground (*smaśāna*) and villages (*gramamarga*) = 8 *dandas*;

Ordinary roads = 4 *dandas*.

System used by Pāṇini, an Indian Sanskrit grammarian from Pushkalavati during the fourth century BCE

										Metric
yojana										14,745.6 m
4	goruta or kośa									3686.4 m
–	–	hastiyama								4.147 2 m
–	–	1 $\frac{1}{8}$	daṇḍa							3.686 4 m
–	–	2 $\frac{1}{7}$	2 $\frac{1}{7}$	khatapaurusa						1.612 8 m
–	–	5 $\frac{1}{7}$	4 $\frac{1}{7}$	2	kisku					806.4 mm
32,000	8000	9	8	3 $\frac{1}{2}$	1 $\frac{3}{4}$	aratni				460.8 mm
64,000	16,000	18	16	7	3 $\frac{1}{2}$	2	vitasti			230.4 mm
768,000	192,000	216	192	84	42	24	12	aṅgula		19.2 mm
6,144,000	1,536,000	1728	1536	672	336	192	96	8	yava	2.4 mm

Presumed system in North India, used before the reign of Akbar the Great (1556–1605)

	करम				
kan					
3	karam				
4 $\frac{1}{2}$	1 $\frac{1}{2}$	gaz			
9	3	2	hath^a		
72	24	16	8	girah^b	
216	72	48	24	3	aṅgula^c

^aIn concept, the distance from the elbow to the end of the middle finger

^bIn concept, the width of three fingers

^cIn concept, the width of the middle finger

Upper scale according to reform of Akbar the Great (ruled 1556–1605)

						Metric
yojana or yodjana						20.5 km
2	gavyuti					10.25 km
4	2	crossa, krossa, cos or coss				5.12 km
400	200	100	tenab			51.2 m
1600	800	400	4	bambou		12.816 m
3200	1600	800	8	2	vansa	6.408 m

Lower scale according to reform of Akbar the Great (ruled 1556–1605)

							Metric
vansa							6.408 m
2 $\frac{1}{2}$	danda, dhanush or orgyla						2.563 m
6 $\frac{1}{4}$	2 $\frac{1}{2}$	gaz or guz					1.025 m
10	4	1 $\frac{3}{5}$	hasta				640 mm
20	8	3 $\frac{3}{5}$	2	vistati			320 mm
240	96	38 $\frac{3}{5}$	24	12	aṅgula		26.67 mm
1200	480	192	120	60	5	grains of rice	5.33 mm
1920	768	307 $\frac{3}{5}$	192	96	8	1 $\frac{1}{5}$	yava (barley grain) 3.34 mm

During the reign (1627–1658) of Shah Jahan, the fifth Mughal Emperor, there existed three different gaz¹:

1 **shahi gaz** = 1.016 m, 1 **Shahijahani gaz** or **Lashkari gaz** = 958.5 mm, and 1 **Aleppo gaz** = 677.3 mm.

Other reported measures:

1 **bam** or **bám** = 3½ cubits = about 1.75 m;
1 **angošt** = 20.32 mm.

25.4 Units of Area

Presumed scale in North India, used before the reign of Akbar the Great (1556–1605)

	बीघा	कनाल	माला		Metric
ghamaon					3372.38 m ²
2	bigha				1686.19 m ²
8	4	kanal			421.547 m ²
160	80	20	marla		21.077 m ²
480	240	60	3	kan²	7.023 m ²

Traditional system

		Metric
cawney or khani		5351 m ²
24	mauney or ground	222.958 m ²

For expressing shares of proprietary rights in a village, based on [WILS]

बीघा	बिस्वा
bigha^a	
20	biṣwa^b

^aAn estate or village

^bA twentieth part of the entire village

British Imperial scale

	बीघा	कट्ठा	चटक	guz ²	Metric
ghamaon (=12,100 yd ²)				6400	10,116.93 m ²
4	bigha or biggah (=3 025 yd ²)			1600	2529.23 m ²
80	20	catta, cotta or cottah (=151¼ yd ²)		80	126.462 m ²
1280	320	16	chattak or chattack (= 9 ²⁹ / ₆₄ yd ²)	5	7.903 85 m ²

¹ [KHAC, p. 182].

25.5 Units of Dry Capacity

Presumed scale for rice and grain in North India, used before the reign of Akbar the Great (1556–1605)

ser				
2	mapte			
4	2	chipte		
8	4	2	kole	
16	8	4	2	nilve

Traditional Hindu upper scale for dry commodities

						Metric
garce						8808 L
5	khahoon					1761.6 L
10	2	candy				880.8 L
80	16	8	parah or soally			110.1 L
1280	256	128	16	adouli or adauli		6.881 L
1600	320	160	20	1¼	pally	5.505 L
5120	1024	512	64	4	3½ seer	1.720 L

Traditional Hindu lower scale for dry commodities

						Metric
seer						1.720 L
1¼	raik					1.376 L
2	1⅓	tipree				860 mL
5	4	2½	kunk			344 mL
20	16	10	4	khoonke		86 mL
25	20	12½	5	1¼	chattack	68.8 mL

Scale reported for grain and grass (varied in different districts and according to the crop), based on [WILS]

बोझ	
bojh, bojá, or bojhá^a	
5	dabi, dabiá, or dubea^b

^aA sheaf or bundle of grass or grain

^bWhen applied to autumn crops, 1 **dabi** = about 10 handfuls, and to spring crops, 1 **dabiá** or **dubea** = about 16 handfuls

Scale reported during the early nineteenth century

					Metric
khári					264 L
16	drona				16.5 L
64	4	ádhaka			4.125 L
256	16	4	prastha		1.031 L
1024	64	16	4	kudaba	257.8 mL

Upper scale for dry commodities measured by weight

					Metric
baha					2640 kg
10	cumbha				264 kg
12½	1¼	shari			211.2 kg
100	10	8	cumbha (short)		26.4 kg
200	20	16	2	drona	13.2 kg

Lower scale for dry commodities measured by weight

					Metric
drona					13.2 kg
4	adhaka				3.3 kg
16	4	prastha			825 g
32	8	2	cudava		412.5 g
256	64	16	8	musti or pala	51.56 g

Other measures reported during the nineteenth century:

- 1 **adouli** or **adauli** (for salt) = 26.34 L;
- 1 **adouli** or **adauli** (for cereals) = 20.32 L;
- 1 **chuoto** = 12.33 L;
- 1 **crue** (for rice) = 11.33–13.66 kg;
- 1 **crue** (for peppers) = 8–9 kg;
- 1 **kuhlah** = 4.1 L.

For salt

ras or heap					
16	ana				
40	2½	khundee			
800	50	20	phura or mun		
6400	400	160	8	kooroo	
12,800	800	320	16	2	pylee
51,200	3200	1280	64	8	4 seer

25.6 Units of Liquid Capacity

Presumed scale for ghee, milk, and oils in North India, used before the reign of Akbar the Great (1556–1605)

maund			
40	seer		
160	4	pav	
640	16	4	chattank

1 **ser** (defined by a law of 1871) = 1 L.

25.7 Units of Weight

During the fourth–fifth centuries BCE²:

1 **silver-māsha** = the weight of 88 white mustard seeds (*Sinapsis alba*).

Presumed upper scale in North India, used before the reign of Akbar the Great (1556–1605)

					Metric
maund					37.324 kg
4	daseri				9.331 kg
8	2	paseri			4.665 kg
16	4	2	dhaser		2.333 kg
32	8	4	2	savaser	1.166 kg
40	10	5	2½	1¼	seer 933.1 g

² According to Kautilya's *Arthaśāstra*. Translation by R. Shamasastri, 8th ed. Mysore: Mysore Printing and Publishing House, 1967, Vol. 2, ch. 10.

Presumed middle scale in North India, used before the reign of Akbar the Great (1556–1605)

						तोला		Metric
seer								933.1 g
2	adher							466.5 g
4	2	pav						233.3 g
8	4	2	adh-pav					116.6 g
16	8	4	2	chattak				58.3 g
64	32	16	8	4	kancha			14.6 g
80	40	20	10	5	1¼	tola		11.7 g
320	160	80	40	20	5	4	siki	2.9 g

Presumed lower scale in North India, used before the reign of Akbar the Great (1556–1605)

तोला		माशा					Metric
tola							11.7 g
4	tak						2.9 g
12	3	masha					972 mg
96	24	8	ratti^a				121.5 mg
384	96	32	4	dhan^b			30.4 mg
1536	384	128	16	4	chawal^c		7.6 mg

^aRatti is the seed of the Abrus Precatorius, also known as Crab's Eye or Rosary Pea

^bThe weight of one wheat berry

^cThe weight of one grain of rice. 1 **jau** (the weight of one barley corn) = 64/45 dhan = about 43.2 mg

Scale used during the reign of Akbar the Great (1556–1605)

				माशा		Metric
mun or maund						25.51 kg
40	seer					637.74 g
1200	30	dam^a				21.258 g
6000	150	5	tank^b			4.252 g
18,000	450	15	3	masha^b		1.417 g
144,000	3600	120	24	8	ruttee^b	177 mg

^aA copper coin also used as a weight

^bUsed for commodity spices. For gold and expensive spices: 1 **misqal** = 6.22 g

Hindu system upper scale (rounded values and estimated values)

							Metric	Metric
áchita							940 kg	933.107 532 kg
10	bhāra or bara						94 kg	93.310 753 kg
100	10	hara					9.4 kg	9.331 075 kg
200	20	2	tulā or tuba				4.7 kg	4.665 538 kg
20,000	2000	200	100	pala			47 g	46.655 376 g
66, 666⅔	6 666⅔	666⅔	333⅓	3⅓	kharsha		14.1 g	13.996 612 g
80,000	8000	800	400	4	1⅓	tola	11.75 g	11.663 844 g

Hindu system lower scale (rounded values and estimated values)

तोला				माशा			Metric	Metric
tola							11.75 g	11.663 844 g
1 $\frac{1}{3}$	kona						7.05 g	6.998 3 g
2 $\frac{1}{2}$	1 $\frac{1}{2}$	dharana					4.7 g	4.665 5 g
4 $\frac{1}{5}$	2 $\frac{1}{5}$	1 $\frac{1}{5}$	tank-sala				2.64 g	2.624 4 g
13 $\frac{1}{3}$	8	5 $\frac{1}{3}$	3	masha			881.25 mg	874.788 mg
80	48	32	18	6	retti or ratica		146.88 mg	145.798 mg
800	480	320	180	60	10	yava	14.69 mg	14.578 mg

Traditional upper scale, as reported during the eighteenth century

								Metric
khari								191.102 976 kg
4	droni							47.775 744 kg
8	2	surpa						23.887 872 kg
16	4	2	drona					11.943 936 kg
64	16	8	4	adhaka				2.985 984 kg
128	32	16	8	2	subha			1.492 992 kg
256	64	32	16	4	2	prastha or manika		746.496 g
1024	512	128	64	32	8	4	kudava	186.624 g

Traditional middle scale, as reported during the eighteenth century

				तोला				माशा		Metric
kudava										186.624 g
2	prasrta									93.312 g
4	2	pala								46.656 g
8	4	2	súkti							23.328 g
16	8	4	2	tola						11.664 g
32	16	8	4	2	bataka					5.832 g
64	32	16	8	4	2	sána				2.916 g
128	64	32	16	8	4	2	dharana			1.458 g
256	128	64	32	16	8	4	2	masha		729 mg
512	256	128	64	32	16	8	4	2	malla	364.5 mg

Traditional lower scale, as reported during the eighteenth century

										Metric
malla										364.5 mg
1 $\frac{1}{2}$	nishapavaka									243 mg
3	2	gunja^a								121.5 mg
18	12	6	yava							20.25 mg
108	72	36	6 $\frac{1}{4}$	sarshapa						3 mg
648	432	216	40 $\frac{1}{2}$	6	raja					$\frac{1}{2}$ mg
3888	2592	1296	243	36	6	yuka				1/12 mg
23,328	15,552	7776	1458	216	36	6	liksha			1/72 mg
139,968	93,312	46,656	8748	1296	216	36	6	truti		1/432 mg

^aA seed of *Abrus precatorium*

British Imperial-linked upper scale established in 1833 (known as the “railway scale” or “government scale”)

						Metric
candy						746.484 48 kg
20	maund					37.324 224 kg
160	8	passeree, pally, dhurree, vis, or visham				4.665 528 kg
400	20	2½	adowly			1.866 211 2 kg
640	32	4	1⅓	raik		1.166 382 kg
800	40	5	2	1¼	seer	933.105 6 g

British Imperial-linked lower scale established in 1833 (known as the “railway scale” or “government scale”)

					तोला	माशा			Metric
seer									933.105 6 g
4	pa or powa								233.276 4 g
16	4	chittack							58.319 1 g
30	7½	1⅛	parah or pince						31.103 52 g
72	18	4½	2⅔	tank					12.959 80 g
80	20	5	2⅔	1⅔	tola, or sicca^a				11.663 82 g
800	200	50	26⅔	11⅔	10	masha			1.166 382 g
6400	1600	400	213⅓	88⅔	80	8	ruttee or rati		145.797 75 mg
25,600	6400	1600	853⅓	355⅔	320	32	4	dhan	36.449 437 5 mg
102,400	25,600	6400	3 413⅓	1 422⅔	1280	128	16	4	punk 9.112 359 375 mg

^aIn 1833, the tola was fixed at 180 grains, i.e., 11.663 82 g

Standard upper scale after 1939

							तोला	Metric
maund								37.324 kg
(=100 lb)								
8	dhurra							4.666 kg
32	4	raik						1.166 kg
40	5	1¼	seer					933.10 g
64	8	2	1⅓	mana				582.96 g
160	20	5	4	2½	pao or powa			233.28 g
640	80	20	16	10	4	chattak		58.319 g
3200	400	100	80	50	20	5	tola	11.664 g

Standard lower scale after 1939

तोला	माशा							Metric
tola								11.664 g
12	masha							972 mg
16	1½	anna						729 mg
96	8	6	ruttee or rati					121.5 mg
384	32	24	4	dhan				30.375 mg
768	64	48	8	2	chawal			15.188 mg
1536	128	96	16	4	2	punk		7.594 mg
6144	512	384	64	16	8	4	khashkha	1.898 mg

Metric-linked system used for gold and silver

तोला	माशा			Metric
tola				11.52 g
12	masha			960 mg
144	12	ruttee		80 mg
576	48	4	dhan	20 mg

Other reported measures:

1 **báni** = 80 rupees = 933.1 g.

25.8 Mughal Empire (1526–1858)

Akbar the Great (1542–1605) standardized the system for weights and measures. For length, he used the width of a barley corn to set the standard for length, and for weight, he used the weight of a barley corn.

Main sources: [HINZ], [KAHN], [KHAC], and [MUBA]

25.8.1 Currency

1 rupee, rupiya or sikka = 64 paisa

1 ashrafi, mohor or mohr

1 shivrai

1 hon

25.8.2 Units of Quantity

1 **koori** = twenty pieces of commodities;

1 **chokra** = eight pieces of commodities;

1 **jor** = two pieces of commodities.

25.8.3 Units of Length

For roads, forts and long distances during the reign of Akbar the Great (1542–1605)

			Metric
ilahi gaz			864 mm
24	ilahi tassuj		36 mm
192	8	jau^a	4.5 mm

^aBarley corn

For temples, gardens and stone houses during the reign of Akbar the Great (1542–1605)

			Metric
ilahi gaz			756 mm
24	ilahi tassuj		31.5 mm
168	7	jau^a	4.5 mm

^aBarley corn

For temples, gardens and stone houses during the reign of Akbar the Great (1542–1605)

			Metric
ilahi gaz			648 mm
24	ilahi tassuj		27 mm
144	6	jau^a	4.5 mm

^aBarley corn

Shahi system, Shahijahani or Lashkari system, and Aleppo system during the reign of Shah Jahan (1592–1666)

			Metric	Metric	Metric
gaz			1.016 m	958.5 mm	677.3 mm
16	greh		63.5 mm	59.9 mm	42.3 mm
32	2	pais	31.7 mm	29.9 mm	21.2 mm

Other reported measures during the reign of Shah Jahan (1592–1666):

1 **top** (for cloth) = about 14 m;

1 **tan** (for cloth) = about 4.5–5 m;

1 **dzern** = unknown value;

1 **kagham** = unknown value.

1 **baghcha** (for tea) = a sack holding about 45–47 kg;

1 **charm** (for indigo) = a sack holding about 23 kg;

1 **kal** (for various commodities) = a sack of unknown size ([KHAC] reported 20–24 kals as a load);

1 **khak** (for clothing) = a bale (holding 124–162 tans of clothing);

1 **sandoogh** = a small box of unspecified size.

25.8.4 Units of Area

During the reign of Akbar the Great (1542–1605)

beegah					
20	biswáh				
400	20	biswánsi or biswáneh			
8000	400	20	tíswánsi or tíswáneh		
160,000	8000	400	20	pitwánsi or pitwáneh^a	
3,200,000	160,000	8000	400	20	unswánsi or unswáneh^a

^aImaginary units

25.8.5 Units of Dry Capacity

Some reported measures during the reign of Shah Jahan (1592–1666):

1 **nafa** (for musk) = about 50–60 kg;

25.8.6 Units of Weight

Commodity system,^a a former system allowed for continued use during the reign of Akbar the Great (1542–1605)

											तोला		Metric	Metric
mun													37.324 kg	25.174 kg
4	daseri												9.331 kg	6.293 kg
8	2	paseri											4.665 kg	3.147 kg
16	4	2	dhaser										2.333 kg	1.573 kg
32	8	4	2	savaser									1.166 kg	786.7 g
40	10	5	2½	1¼	ser								933.10 g	629.4 g
80	20	10	5	2½	2	adher							466.55 g	314.7 g
160	40	20	10	5	4	2	pav						233.27 g	157.3 g
320	80	40	20	10	8	4	2	adh-pav					116.64 g	78.7 g
640	160	80	40	20	16	8	4	2	chattank				58.32 g	39.3 g
2560	640	320	160	80	64	32	16	8	4	kancha			14.58 g	9.8 g
3200	800	400	200	100	80	40	20	10	5	1¼	tola		11.66 g	7.9 g
12,800	3200	1600	800	400	320	160	80	40	20	5	4	siki	2.92 g	2.0 g

^aValues according to www.indiacurry.com (access 2012-11-24) and [NARA, p. 181]

A series of coins used for weighing spices during the reign of Akbar the Great (1542–1605)

					Metric
dam or paisa					20.4 g
2	dhela				10.2 g
4	2	paula			5.1 g
5	2½	1¼	tank		4.1 g
8	4	2	1⅓	damri	2.5 g

For gold during the reign of Akbar the Great (1542–1605)

										Metric
misqal										6.221 g
6	dang									1.037 g
24	4	tassuj								259.196 mg
48	8	2	habbah							129.598 mg
96	16	4	2	jau^a						64.799 mg
576	96	24	12	6	khardal^b					10.800 mg
6912	1152	288	144	72	12	fal				0.900 mg
41,472	6912	1728	864	432	72	6	fatil			0.150 mg
248,832	41,472	10,368	5184	2592	432	36	6	naqir		0.025 mg
1,492,992	248,832	62,208	31,104	15,552	2592	216	36	6	qitmir	0.004 mg
17,915,904	2,985,984	746,496	373,248	186,624	31,104	2592	432	72	12	zarrah 0.0003 mg

^aThe weight of a barley corn

^bThe weight of a mustard seed

Other reported measures during the reign of Shah Jahan (1592–1666):

1 **lank** = 37.79 g.

At Dacca, present-day Dhaka in Bangladesh

		Metric
maund		37.134 kg
40	seer	928.350 g

25.9 British India

Three provinces (Bengal, Bombay and Madras) were established by the British East India Company per the terms of the Pitt’s India Act of 1784. The Act got the administration of the British East India Company under the control of the British Government.

25.9.1 Bengal Presidency (1774–1905)

A colonial region of British India, comprising undivided Bengal, which is present-day Bangladesh and West Bengal, as well as Assam, Bihar, Meghalaya, Orissa and Tripura. In 1854, the area was renamed Bengal, Bihar, and Orissa Province. The province was divided into two provinces: West Bengal and East Bengal, in late 1905. In 1912, the partition was mainly reversed, Bihar and Orissa were made separate provinces, and the province was renamed the Fort William Presidency. The Bengal Presidency was restored in 1937, but in 1947, it was divided between India and Pakistan. Many cities, pergunnahs and districts under the Presidency are mentioned below under the present states in India, e.g., Allahabad, Aummoodh, Bairseeah, Bauleah, Beemmar, Benares, Bedeck, Bhilsa, Bhopal, Burgong, Caplee, Commercolly, Coolpahar, Cossimbazar, Dacca, Dewass, Esslampore, Etawah, Furruckabad, Ghouhown,

Ghrowlle, Hummerpore, Hurrupaul, Indore, Jungypore, Katee, Luckipore, Lucknow, Malda, Malwa, Mowdhaw, Mundissor, Nolye, Omutwarra, Ougein, Pandree, Patna, Pertabghur, Radnagore, Rault, Roonch, Rungypore, Rutlam, Sallolpore, Seessolurh, Soomerpore, Soonamooky and Soopah.

Main source: [MITR]

Currency

Trading payment:

1 Bengal presidency mohur = 16 rupees = 256 annas = 1024 pices = 3072 pies

Bazar payment:

1 kahun = 16 puns = 322 gundas = 1280 cowries
The value of the cowrie was unstable.

For cloth

					Metric
guj					914.4 mm
2	hath or haut				457.2 mm
16	8	gheria or gerah			57.15 mm
48	24	3	angulla, ungooly, or unguelle		19.05 mm
144	72	9	3	corbe, jaub, or joab	6.35 mm

British Imperial-linked system for cloth

				Metric
yard				914.4 mm
4	quarter			228.60 mm
16	4	nail		57.15 mm
36	9	2¼	inch	25.40 mm

Units of Length

Upper scale

					Metric
mandiny^a					731,520,000,000 m
100	gunduh				7,315,200,000 m
10,000	100	coonduh			73,152,000 m
1,000,000	10,000	100	mundul		731,520 m
100,000,000	1,000,000	10,000	100	yojan	7315.2 m

^aThe circumference of the earth

Lower scale

									Metric
yojan									7315.2 m
2	ghoorbutty								3657.6 m
4	2	coss							1828.8 m
4000	2000	1000	dhunnoo						1.829 m
16,000	8000	4000	4	hauth					457.2 mm
32,000	16,000	8000	8	2	bigot				228.6 mm
96,000	48,000	24,000	24	6	3	moosty			76.2 mm
384,000	192,000	96,000	96	24	12	4	ungooly		19.05 mm
1,152,000	576,000	288,000	288	72	36	12	3	jow or jacob ^a	6.35 mm

^aThe length of a barley grain

Units of Area

बीघा	कट्ठा	चटक	गंडा					Imperial	Metric
bigha^a								120 ft × 120 ft	1337.804 m ²
20	cottah							26¾ ft × 26¾ ft	66.890 m ²
320	16	chuttack						6¾ ft × 6¾ ft	4.181 m ²
6400	320	20	haut						209.03 dm ²
12,800	640	40	2	biggot					104.52 dm ²
38,400	1920	120	6	3	mooty				34.84 dm ²
153,600	7680	480	24	12	4	ungooly			8.71 dm ²
4,147,200	207,360	12,960	648	324	108	27	jaub		322.6 cm ²

^aAlso reported, [ROSE], as 1660 sq yd = about 1387.97 m²

Units of Volume

Some reported measures for things that have length, breadth and depth:

- 1 **ton of load** (for hewn timber) = 50 cubic feet;
- 1 **ton of shipping** = 42 cubic feet;
- 1 **ton of load** (for round timber) = 40 cubic feet;
- 1 **load of earth** = 3 3 3 feet = 27 cubic feet;
- 1 **solid foot** = 12 12 12 inches = 1728 cubic inches.

Some other reported measures:

- 1 **cart** (for corn) = 40 bushels = 1409.55 L;
- 1 **chaldron** (for coal) = 12 sacks = 36 bushels = 1268.59 L;
- 1 **score** (for coal) = 5 pecks = 704.77 L;
- 1 **load** (for corn) = 5 bushels = 176.19 L;
- 1 **sack** (for coal) = 3 bushels = 105.72 L.

Units of Dry Capacity

Many dry commodities were sold by weight.

British Imperial-linked system for dry commodities in general

								Metric
last								2819.10 L
2	wey							1409.55 L
10	5	quarter						281.91 L
20	10	2	comb					140.95 L
40	20	4	2	strike				70.48 L
80	40	8	4	2	bushel			35.24 L
320	160	32	16	8	4	peck		8.810 mL
640	320	64	32	16	8	2	gallon	4.405 mL

Units of Liquid Capacity

British Imperial-linked system for general use

					Imperial	Metric
maund					11 gal	41.639 L
40	seer					1.041 L
160	4	powah				260.24 mL
640	16	4	chuttack			65.06 mL
3200	80	20	5	sicca rupee		13.01 mL

British Imperial-linked system for ale and beer

								Metric
butt								499.084 L
2	hogshead							249.542 L
3	1½	barrel						166.361 L
6	3	2	kilderkin					83.181 L
12	6	4	2	firkin				41.590 L
108	54	36	18	9	gallon			4.621 L
432	216	144	72	36	4	quart		1.155 L
864	432	288	144	72	8	2	pint	577.6 mL

British Imperial-linked system for wine

								Metric
tun								953.924 L
2	Pipe							476.962 L
3	1½	puncheon						317.975 L
4	2	1⅓	hogshead					238.481 L
6	3	2	1½	tierce				158.987 L
252	126	84	63	42	gallon			3.785 L
1008	504	336	252	168	4	quart		946.35 mL
2016	1008	672	504	336	8	2	pint	473.18 mL

Some other reported measures:

- 1 **rundlet** = 18 gallons = 68.137 L;
- 1 **anker** (for brandy) = 10 gallons = 37.854 L.

Traditional system at Bauleah and Jungypore

		Metric	Metric
chattack		43.654 g	42.576 g
3¾	roupie-sicca	11.641 g	–

Units of Weight

1 **khivas** = ~400 kg.

Traditional bazaar system and British Imperial-linked system during the late eighteenth century

							Metric	Metric
maud							37.241 6 kg	37.324 16 kg
8	pussaree						4.655 2 kg	4.665 52 kg
40	5	seer					931.04 g	933.104 g
160	20	4	pouha				232.76 g	233.276 g
640	80	16	4	chattack			58.19 g	58.319 g
1600	320	64	16	4	kancha		14.55 g	14.580 g
12,800	1600	320	80	20	5	sicca	2.91 g	2.916 g

Upper scale for factory-made products

					तोला		Metric ^a	Metric ^b
maund							37.32 kg	33.87 kg
8	pussaree^c						4.67 kg	4.23 kg
40	5	seer					933.12 g	846.75 g
160	20	4	pao, pouah, or powa				232.28 g	211.69 g
640	80	16	4	chattack or chitak			58.32 g	52.92 g
2560	320	64	16	4	khanchaa or tola		14.58 g	13.23 g
3200	400	80	20	5	1¼	sicca	11.663 803 8 g (=180 gr)	10.584 g

^aFor general goods, such as bazaar values (1 **tola** = 180 troy grains according to Regulation VII c, 1833)

^bFor formal trade, such as “factory” values (c. 1830)

^cFor liquids only

Lower scale for factory made products

	माशा						Metric
sicca							11.664 g
10	masha						1.166 4 g
12½	1½	anna					911.25 mg
80	8	6¼	ruttee or ratti				145.8 mg
320	32	25	4	dhan			36.45 mg
640	64	50	8	2	nely		18.225 mg
1280	128	100	16	4	2	punkho	9.114 mg

Traditional system for grains before 1830 and after 1830

							Metric	Metric
kahun or khahoon ^a							1355.4 kg	1349.3 kg
16	sully or soallie ^b						84.71 kg	84.83 kg
40	2½	maund					33.88 kg	33.73 kg
320	20	8	pally or palle				4.24 kg	4.22 kg
1280	80	32	4	raik			1.06 kg	1.05 kg
5120	320	128	16	4	koonkee or konku ^c		264.7 g	263.5 g
25,600	1600	640	80	20	5	chattack	52.9 g	52.7 g

^a[KAHN] reported 1354.73 kg

^bBefore 1830 = 186⅔ lb, after 1830 = 187⅞ lb

^c[KRÜG, p. 145] reported 211²³/₂₅ g

British Imperial-linked system for wool

							Metric
last							1981.290 kg
12	sack						165.107 kg
24	2	wey					82.554 kg
156	13	6½	tod				12.701 kg
312	26	13	2	stone			6.350 kg
624	52	26	4	2	clove		3.175 kg
4368	364	182	28	14	7	pound	453.592 g

For cotton and for general use at Aummoodh

			Metric	Metric
maund			27.213 kg	36.850 kg
40	seer		680.320 g	921.260 g
640	16	chattack	42.520 g	57.579 g

At Jungypore

		Metric
seer		681.220 g
16	chattack	42.576 g

For gold and silver

tolah					
10 ³ / ₃₂	massa				
12½	1 ³ / ₁₃	anna			
100	8	6½	rutty		
400	32	25	4	dhan	
1600	128	100	16	4	punko

For medical use

					Metric
tolah					933.104 g
2	massa				466.552 g
4	2	dhan			233.276 g
20	10	5	rutty		46.655 g
80	20	20	4	jaub	11.664 g

Units of Time

										Equal to
joog										12 years
12	batsar									1 year
72	6	rhitoo								–
144	12	2	maus							–
288	24	4	2	puhka						–
4320	360	60	30	15	hufta					1 week
30,420	2520	420	210	105	7	day				24 hours
241,920	20,160	3360	1680	840	56	8	prubur			3 hours
1,814,400	151,200	25,200	12,600	6300	420	60	7½	ghurree		24 minutes
108,864,000	9,072,000	1,512,000	756,000	378,000	25,200	3600	450	60	poll	–

25.9.2 Bombay Presidency (1618–1947)

A colonial region of British India that, at its greatest extent, comprised Gujarat, northwestern Karnataka, most of Maharashtra, Aden (in present-day Yemen) and Sindh (in present-day Pakistan). Many cities, pergunnahs and districts under the Presidency are mentioned below under the present states in India, e.g., Ahmedabad, Ahmednagar, Ahmoode, Anjar, Bardoler, Baroda, Belgam, Bhoottsur, Bohare, Broach, Bulsar, Calpar, Chanadore, Darwar, Deckan Poona, Dindore, Doongurpoor, Hansot, Havery, Hutargam, Jamkhair, Jumboosur, Katee, Koombhareea, Kotool, Kurdah, Kurmulla, Kurod, Mota, Nassuck, New Hoobly, Nowlgoond, Ocklesur, Paichal, Palloda, Parnair, Parnere, Rahory, Rajao, Ranees Bednore, Roombharee, Shewgawm, Soopa, Sunganmair, Surat, Tumbuck, Turkesur, and Waruha.

Currency

1800–: 1 Bombay rupee
1793–1800: 1 Surat rupee

Units of Length

					Metric
yard					914.392 mm
1⅓	guz				685.794 mm
2	1½	hath, covid, or cubit			457.196 mm
32	24	16	tassoo		28.574 mm
64	48	32	2	angoolam	14.287 mm

Units of Area

Estimated scale during the mid-nineteenth century

					guz²
chahar					28,388.6
12	biggah				2365.7
55⅓	4⅓	cawnie			514.3
–	–	1⅓	nivartana		400
–	–	–	–	kani	292.4
–	–	–	20⅓	15⅓	ground 19.3

[KAHN] reported 1 biggah = 20 pand = about 3257.77 m² and [MART3] = 3257.70 m²

Other measures reported during the nineteenth century:

1 **ground** = 20.3 m²;
1 **kani** = 307.5 m²;

1 **nivartana** = 20 guz 20 guz = 420.25 m²;
 1 **cawnie** = 540 m²;
 1 **biggah** = 2468 m²;
 1 **chahar** = 29,620 m².

Units of Dry Capacity

Most commodities, except grain and salt, were usually sold by weight.

Traditional system

						Metric
garce						8808 L
10	candy					880.8 L
80	8	parah				110.1 L
1280	128	16	adoulie			6.881 L
5120	512	64	4	seer		1.720 L
10,240	1024	128	8	2	tipree	860.16 mL

For grain at Bombay, present-day Mumbai, and on the Konkan Coast

						Metric
morra						1530.311 L
3½	khundee					489.699 L
25	8	parah				61.212 L
400	128	16	pylee			3.826 L
1600	512	62	4	seer		956.44 L
3200	1024	128	8	2	tipree	47.82 L

For salt at Bombay, present-day Mumbai

				Metric	Metric
rash or heap				40,641.900 992 kg	42,148.160 L
16	anna			2540.118 812 kg	2634.260 L
1600	100	parah or parrak		25.401 188 kg	26.342 600 L
16,800	1050	10½	adowly	2.419 161 kg	2.508 819 L

Alternative scale for salt at Bombay, present-day Mumbai

					Metric
rash or heap					20,085.24 L
10	anna				2008.52 L
1000	100	basket or tokeabhur			20.085 L
105,000	10,500	10½	adowly		1.913 L
210,000	21,000	21	2	seer	956.44 L

For grain in the Salsee muhal and Vijyadroog talooka

						Metric
khundee or churolee						1836.374 L
6	roluh					306.062 L
120	20	kooroo				15.303 L
480	80	4	pylee			3.826 L
960	160	8	2	adolee		1.913 L
1920	320	16	4	2	seer	956.4 mL

Units of Liquid Capacity

As a commercial measure, the English Wine gallon was used: 1 **gallon** = 3.785 301 L.

Units of Weight

For goods in general

							Metric
bahar or candy							254.011 881 kg
6¼	parrak ("heavy")						40.641 901 kg
8	1½ ₅	parrak (general use)					31.751 485 kg
20	3½	2½	maund				12.700 594 kg
800	128	100	40	seer			317.514 8 g
24,000	3840	3000	1200	30	piece or parah		10.583 8 g
57,600	9216	7200	2880	72	2½	tank	4.409 9 g

For rice and paddy, based on Milburn, Oriental Commerce, 1825

						Metric
morah						391.81 kg
4	bahar or candy					97.95 kg
25	6¼	parrak or parah				15.67 kg
500	125	20	pallie, paily, or pylee			783.6 g
3750	937½	150	7½	seer		104.5 g
7500	1875	300	15	2	tipree	52.2 g

For rice at Bombay, present-day Mumbai, based on [MART3]

						Metric	Metric
morah						391.790 800 kg	~352 L
4	candy					97.947 700 kg	~88 L
25	6¼	parah				15.671 632 kg	~14 L
500	125	20	adowly			783.582 g	—
3750	937½	150	7½	seer		104.478 g	—
7500	1875	300	15	2	tipree	52.239 g	—

For corn

						Metric
candy						162.567 604 kg
8	parah ^a					20.320 950 5 kg
128	16	adowly or paily				1.270 059 4 kg
512	64	4	seer			317.514 8 g
1024	128	8	2	tipree		158.757 4 g

^aIn practical terms, according to [MART3], usually sold by 17 adowlies = 21.591 010 kg

For other cereals

						Metric
morah						222.26 kg
$3\frac{1}{8}$	bahar or candy					71.123 kg
25	8	parrak or parah				8.890 kg
175	56	7	pallie, paily, or pylee			1.270 kg
700	224	28	4	seer		317.514 7 g
1400	448	56	8	2	tipree	158.757 35 g

For spirits and arrack

			Metric
maund			34.797 036 kg
50	seer		695.940 7 g
3000	60	rupee	11.599 g

For pearls and gems

					Metric
tank					4.665 5 g
24	ruttee				194.396 g
96	4	quarter			48.599 mg
330	$13\frac{3}{4}$	$3\frac{7}{16}$	toca or tuchal		14.138 mg
384	16	4	$1\frac{27}{165}$	anna	12.150 mg

A dummy weight scale used for pearls and diamonds, according to [MART3]

				Metric
chow				19.331 7 mg
4	quarter			4.832 9 mg
100	25	docra		193.3 µg
1600	400	16	buddam	12.1 µg

The weights of the pearls were given in Tanks. The square of the Tanks multiplied by 330 and divided by the number of beads gives the weight in chows

For gold and silver

	तोला				Metric
seer					278.376 g
24	tola				11.599 g
960	40	wahl or vall			289.975 mg
2400	100	$2\frac{1}{2}$	gonze		115.992 mg
14,400	600	15	6	chowe	19.332 mg

Other measures reported during the nineteenth century:

- 1 **candy** (for grains used for pearl production and for cotton) = 28 maunds = 355.616 634 kg;
- 1 **candy** (for iron from Surat) = 20 maunds of Surat = 340.158 333 kg;
- 1 **candy** (for hemp) = 22 maunds = 279.413 069 kg;
- 1 **candy** (for wool and peppers) = $5\frac{1}{4}$ Cwt = 266.712 475 kg;
- 1 **hundredweight** (for rubber, oilseeds, and pearls) = 50.802 377 kg;
- 1 **maund** (for indigo) = 46 lbs = 20.865 262 kg;
- 1 **maund** (for coffee) = 18.624 514 kg;
- 1 **maund** (for iron from Surat, ivory and mercury) = 40 seers of Surat = 17.007 917 kg;
- 1 **seer** (for cereals at Bagulkota) = 1.551 12 kg;
- 1 **seer** (for ivory and mercury) = 425.198 g;
- 1 **seer** (for general use at Bagulkota) = 233.25 g.

25.9.3 Madras Presidency (1652–1947)

See also *Calcutta*.

A colonial region of British India that, at its greatest extent, comprised much of southern India, including present-day Tamil Nadu, the Malabar region of North Kerala, the Lakshadweep Islands, the Coastal Andhra and Rayalaseema regions of Andhra Pradesh, Brahmapur and the Ganjam districts of Orissa and the Bellary, Dakshina Kannada, and the Udupi districts of Karnataka. In 1785, the Governor of Madras was made subordinate to the Governor-General at Calcutta.

Currency

–1815: 1 Madras pagoda = 3½ rupees = 42 fanam = 3360 cash

British Imperial-linked system, based on [MART3]

		Imperial	Metric
guz		1 yd	0.914 392 m
2	mujam	½ yd	457.196 mm

Units of Length

Traditional upper scale, based on [MART3]

			Metric
cadam			11,112.062 222 m
7½	nagi		1481.608 296 m
15	2	cupuduturam	740.804 148 m

British Imperial-linked system at Dukhan, based on [COLE2]

			Metric
kattee			2.667 m
5%	hath^a		457.196 mm
35	6	mooshtee^b	76.199 mm

^aA cubit = the mean length of five men's arms, measured from the elbow-joint to the tip of the middle finger

^bA fist

Traditional lower scale, based on [MART3]

			Metric
chiuli			6.376 320 m
24	ady, adih, or adee		265.680 mm

Traditional system used among the Marathi people, mainly based on [COLE2]

									Metric
yojun									14,630.4 m
2	guwyotee								7315.2 m
4	2	kohs							3657.6 m
10,400	5200	2600	duncoch^a						1.407 m
41,600	20,800	10,400	4	hath					351.7 mm
83,200	41,600	20,800	8	2	weet				175.8 mm
249,600	124,800	62,400	24	6	3	mooshtee			58.6 mm
998,400	499,200	249,600	96	24	12	4	buht		14.6 mm
7,987,200	3,993,600	1,996,800	768	192	96	32	8	juw^b	1.8 mm

^aThe length of a man's outstretched arm

^bA barley corn

British Imperial-linked system for cloth, used among the Marathi people, mainly based on [COLE2]

				Metric
guj				914.4 mm
16	ghirra			57.1 mm
24	1½	tussoo		38.1 mm
48	3	2	boht	19.1 mm

Other reported measures:

1 **kohs** = about 1½–2½ mile = about 2½–4 km.

Units of Area

Traditional system and British Imperial-linked system

काउनी	मनाई	Metric	Imperial	Metric
cahni or cawney		~534.1 m ²	57,600 sq ft	5351.118 9 m ²
24	mahni or maoney	~222.5 m ²	2,400 sq ft	222.963 287 5 m ²

British Imperial-linked system at Dukhan, based on [COLE2]

					Imperial	Metric
chahoor					529,200,000 cu in	341,418.672 m ³
20	rookeh				26,460,000 cu in	17,070.934 m ³
120	6	beegah			4,410,000 cu in	2845.156 m ³
2400	120	20	paand		220,500 cu in	142.258 m ³
48,000	2400	400	20	kattee	11,025 cu in	7.113 m ³

Units of Dry Capacity

Traditional and British Imperial-linked system (1 garce = 300,000 cu in)

					Metric	Metric
grace, gerise, or gahrs					4916.360 629 L	4916.119 2 L
80	parah or parrah				61.454 507 86 L	61.451 49 L
400	5	curumi, marcal, or mercial			12.290 901 57 L	12.290 298 L
3200	40	8	puddy or puddee		1.536 362 696 L	1.536 287 L
25,600	320	64	8	azhaccu, olluck, or ollock^a	192.045 337 mL	192.036 mL

^a[NOBA] reported 192.03 mL, [JERV] reported 191.29 mL and [MART3] reported 192.045 mL

Units of Liquid Capacity

Traditional system and London-linked system

					Metric	Metric
candy					245.280 L	245.818 031 L
4	parah or parrah				61.320 L	61.454 508 L
20	5	marcal or mercial			12.264 L	12.290 902 L
160	40	8	puddy, puddee, or measure		1.533 L	1.536 363 L
1280	320	64	8	olluck or ollock	191.625 mL	192.045 mL

British Imperial-linked system for oil in the Malabar district, based on [DOUR]

		Imperial	Metric
choadany		3¼gal	17.05 kg
24	measure		710.3 g

Units of Weight

At Anjinga

		Metric
candy		253.98 kg
20	maund	12.699 kg

At Lakshadweep

അചിതം				Metric
áchita				544 kg
10	khandaka or bhára			54.4 kg
100	10	tulàm		5.44 kg
20,000	2000	200	pala or nishka	27.2 g

Traditional system

							Metric
baruay							218.88 kg
20	manunga						10.944 kg
160	8	visay					1.368 kg
800	40	5	seer				273.6 g
3200	160	20	4	pao			68.4 g
6400	320	40	8	2	pollam or adpao		34.2 g
64,000	3200	400	80	20	10	varahun	3.42 g

British Imperial-linked upper scale (after c. 1800)

						Metric
gursay						4,535.926 525 kg
20	candy or bahar					226.796 326 2 kg
400	20	maund				11.339 816 31 kg
2000	100	5	ris			2.267 963 261 kg
3200	160	8	1⅔	vis or bis		1.417 477 038 kg
16,000	800	40	8	5	seer	283.495 4 g

British Imperial-linked lower scale (after c. 1800)

						Metric
seer						283.495 4 g
4	powe or pao					70.873 85 g
8	2	pollam or varaha				35.436 925 g
80	20	10	pagoda			3.543 692 5 g
2880	720	360	36	fanam		98.435 902 mg
230,400	57,600	2880	2880	80	dafh	1.230 448 mg

General market upper scale (after c. 1800)

					तोला		Imperial	Metric
bahar							3,456,000 gr	223.945 kg
20	maund						172,800 gr	11.197 kg
800	40	seer					4320 gr	279.931 g
3200	160	4	powa or pao				1080 gr	69.983 g
9600	480	12	3	pollam			360 gr	23.328 g
28,800	1440	36	9	3	tola		120 gr	7.776 g
64,000	3200	80	20	6%	2%	pagoda	54 gr	3.499 g

General market lower scale (after c. 1800)

तोला				Imperial	Metric
tola				120 gr	7.776 g
2%	pagoda			54 gr	3.499 g
20	9	chinan		6 gr	388.78 mg
6000	2700	300	cash	0.02 gr	1.296 mg

For diamonds

		Metric
carat		205.304 mg
4	grain	51.326 mg

For gold at Dukhan, based on [COLE2]

				Metric
tollah				11.907 033 g
12	massah			992.253 mg
48	4	waal		2.977 mg
96	8	2	goonj ^a	1.488 mg

^aThe weight of a seed of *Abrus precatorius*, a mustard seed

Other reported measures:

- 1 **mangelin, mangalle** or **mangol** (for pearls) = 388.80 mg;
- 1 **hun** or **star pagoda** (for gold and silver) = 3.405 8 g.

25.10 Agra Presidency (1834–1836)

In 1835, this area was renamed the North-Western Provinces.

Units of Area

1 **bigha** = 60 60 ilahy guz = 3025 sq yd = 2529.2 m².

25.11 Ajmer-Merwara-Kekri (1871–1947)

The area was part of the Agra Presidency between 1834 and 1871. In April 1871, it became a separate province.

I have not found any data directly related to this province.

25.12 Assam (1912–1947)

This area was established as a province of British India in March 1912.

Units of Area

1 **lochhá** = 11½ sq ft = 1.068 m².

25.13 Baluchistan (1887–1947)

I have not found any data directly related to this province.

25.14 Bihar and Orissa (1912–1947)

In 1936, Bihar and Orissa became separate provinces.

I have not found any data directly related to this province.

25.15 Central Provinces and Berar (1862–1947)

The Nagpur province was annexed to British India in 1853. In 1861, Nagpur was united with Saugor Nerbudda territories to form the Central Provinces. In 1936, the Central Provinces were united with Berar.

I have not found any data directly related to this province.

25.16 Delhi (1912–1947)

Units of Area

1 **bigha** = 2500 sq yd (“on average”) = 2090.3 m².

25.17 Gwalior State (1761–1948)

This Kingdom was established in 1761 and became part of the union of India in 1948.

I have not found any data directly related to this province.

25.18 Panth-Piploda (1935–1947)

I have not found any data directly related to this province.

25.19 Sind (1936–1947)

This area was subordinated to Bombay between 1843 and 1936. It became part of Pakistan in 1947.

25.20 Surat (1658–1685)

I have not found any data directly related to this province.

25.21 United Provinces (1902–1947)

I have not found any data directly related to this province.

25.22 Calcutta (Present Kolkata)

This city, which was founded by the British East India Company in 1686, was the capital of British India until 1911.

Units of Length

Old British Imperial-linked upper scale

						Metric
yojan						7315.134 32 m
4	coss or miglio					1828.783 58 m
4000	1000	depoh or dhanu				1.828 783 58 m
8000	2000	2	guz			0.914 391 79 m
16,000	4000	4	2	hath or haut ^a		457.195 895 mm
32,000	8000	8	4	2	bighath	228.597 947 5 mm

^aA cubit

Old British Imperial-linked lower scale

					Metric
bighath^a					228.597 947 5 mm
3	moot^b				76.199 315 83 mm
4	1 $\frac{1}{3}$	gherrie			57.149 486 88 mm
12	4	3	ungulee^c		19.049 828 96 mm
36	12	9	3	jaob, jorbe, or jow^d	6.349 942 986 mm

^aA span^bThe breadth of a hand^cThe width of a finger^dThe length of three barleycorns

New British Imperial-linked upper scale

						Metric
coss, kor, or koss						1524 m
33 $\frac{1}{3}$	jarib					45.72 m
200	6	niranga				7.620 m
666 $\frac{2}{3}$	20	3 $\frac{1}{3}$	lath			2.286 m
1000	30	5	1 $\frac{1}{2}$	danda, bow, depoh, or dhanu		1.828 8 m
2000	60	10	3	2	guz	0.914 4 m

New British Imperial-linked lower scale

							Metric
guz^a							0.914 4 m
2	covid, hath, or haut^a						457.2 mm
4	2	bighath or span^a					228.60 mm
12	6	3	moot or hand				76.20 mm
24	12	6	2	tassoos^a			38.10 mm
48	24	12	4	2	unglee, angula, or ungul^a		19.050 mm
144	72	36	12	6	3	jsob, jacob, jorbe, or jow	6.350 mm

^aAlso used for cloth

Metric-linked upper scale

						Metric
coss, kor, or koss						1525 m
33 $\frac{1}{3}$	jarib					45.75 m
200	6	niranga				7.625 m
666 $\frac{2}{3}$	20	3 $\frac{1}{3}$	lath			2.288 m
1000	30	5	1 $\frac{1}{2}$	danda, bow, depoh, or dhanu		1.83 m
2000	60	10	3	2	guz	0.915 m

Metric-linked lower scale

						Metric
guz						0.915 m
2	covid, hath, or haut					457.5 mm
4	2	bighath or span				228.75 mm
12	6	3	moot or hand			76.25 mm
48	24	12	4	unglee, angula, or ungul		19.062 mm
144	72	36	12	3	jsob, jacob, jorbe, or jow	6.354 mm

Units of Area

British Imperial-linked system

		बिघ	कट्ठा					Imperial	Metric
cawney								576,000 Imp sq ft	53,512.064 m ²
25 ³ / ₅	tenab							22,500 Imp sq ft	2,090.315 m ²
40	1 ⁹ / ₁₆	bigha						14,400 Imp sq ft	1,337.801 6 m ²
800	31 ¹ / ₄	20	cottah					720 Imp sq ft	66.890 08 m ²
3200	125	80	4	pahah				180 Imp sq ft	16.722 52 m ²
12,800	500	320	16	4	chittack			45 Imp sq ft	4.180 63 m ²
64,000	2500	1600	80	20	5	guz²		9 Imp sq ft	0.836 126 m ²
256,000	10,000	6400	320	80	20	4	gandeh or hath²	2 ¹ / ₄ Imp sq ft	0.209 031 5 m ²

Units of Capacity

For grain during the nineteenth century and metric-linked system during the twentieth century

							Metric	Metric
khahoon^a							1318.11 L	1760 L
16	soally						82.38 L	110 L
320	20	pally^b					4.12 L	5.5 L
1280	80	4	raik				1.03 L	1.375 L
5120	320	16	4	kunk			257.4 mL	343.75 mL
20,480	1280	64	16	4	khoonke or koonke		64.4 mL	85.937 5 mL
25,600	1600	80	20	5	1 ¹ / ₄	chattack	51.5 mL	68.75 mL

^a1 **kahoon** = 37.404 8 bu, according to *Foreign trade requirements*. New York: Lewis, Scribner & Co., 1902, p. 467. Also reported as equal to 40 maunds

^bVaried between 4.2 and 5.5 L

Units of Weight

Bazaar system before 1833

							Metric
maund							37.255 075 kg
8	pussaree or measure						4.656 884 kg
40	5	seer					931.376 875 g
160	20	4	pauah or pauwa				232.844 218 g
640	80	16	4	chittack			58.211 054 g
2560	320	64	16	4	khanchaa		14.552 764 g
3200	400	80	20	5	1¼	sicca	11.642 211 g

Factory system

								Metric
khahoon								1354.730 048 kg
16	soallee							84.670 628 kg
40	2½	maund						33.868 251 kg
320	20	8	pallie					4.233 531 4 kg
1280	80	32	4	raik				1.058 382 85 kg
1600	100	40	5	1¼	seer			846.706 275 g
5120	320	128	16	4	¾	koonkee		264.595 711 g
25,600	1600	640	80	20	16	5	chittack	52.919 142 g

Bazaar system after 1833

						तोला	Metric
maund							37.324 195 2 kg
8	pally, pussaree, or dhurra						4.665 524 4 kg
32	4	raik					1.166 381 1 kg
40	5	1¼	seer				933.104 88 g
160	20	5	4	pouah or pauwa			233.276 22 g
640	80	20	16	4	chittack		58.319 055 g
3200	400	100	80	20	5	tola or sicca	11.663 811 g

For general use during the late nineteenth century

					Metric
candy					278.35 kg
20	maund				13.92 kg
680	34	pound			409.3 g
1360	68	2	seer		204.7 g
2720	136	4	2	pollam	102.3 g

For gold and silver before 1833

तोला	माशा			Metric
tola				11.663 811 g
12	masha			971.984 25 mg
96	8	ruttee		121.498 031 mg
384	32	4	dhan	30.374 507 mg

For gold and silver after 1833

तोला		माशा					Metric
tola							14.552 764 g
1¼	sicca						11.642 211 g
12½	10	masha					1.164 221 g
16	12½	1½ ₂₅	anna				909.547 731 g
100	80	8	6¼	ruttee			145.528 mg
400	320	32	25	4	dhan		36.382 mg
1600	1280	128	100	16	4	punkho	9.095 mg

25.23 Hyderabad State (1947–1948)

This region was a province of the Mughal Empire from 1724–1798, a Princely state of the British Raj from 1798–1947, and independent from 1947–1948.

Currency

–1950: 1 Hyderabad rupee = 16 annas = 192 pai

I have not found any data directly related to this state.

25.24 Kingdom of Mysore (1565–1799)

This Kingdom became independent in 1565, was a Princely state under the British Raj from 1799–1947, and a state within the union of India from 1947–1956.

I have not found any data directly related to this state.

25.25 Baroda State (1721–1949)

This Princely state lasted from 1721 until 1949, when it was acceded to the union of India.

I have not found any data directly related to this state.

25.26 Kashmir and Jammu (1846–1949)

This Princely state was created in 1846. It was a state within the union of India from 1947–1949.

I have not found any sources directly related to this state.

25.27 Andhra Pradesh

Various dynasties have ruled over this area. These include Andhra/Satavahana, Shake, Ikshvakas, Qutb Shahis and Nizam of Hyderabad. During the 1600s, the British Empire purchased the area from Nizam of Hyderabad.

Main source: [MADR]

Currency

In Masulipatam (present-day Machilipatnam) during British rule:

1 pagoda = 3½ rupee = 56 annas

Units of Quantity

1 **salanga** (for mangoes, plantains, guavas, plamyra leaves and duck cakes) = 20 cheyyis = 100 + 1 (for every salnaga, one cheyyi extra was thrown in as a kosani (=for luck));

1 **cheyyi** (for mangoes, plantains, guavas, plamyra leaves and duck cakes) = 5.

Units of Length

Traditional system and British Imperial-linked system in Nellore

					Metric	Metric
bara					2.001 520 m	1.829 m
2	gajam				1.000 760 m	914.392 mm
4	2	mura			500.38 mm	457.196 mm
8	4	2	jana		250.19 mm	228.598 mm
72	36	18	9	angulam	27.80 mm	25.400 mm

Other reported measures:

1 **amada** = about 16 km;

1 **kosu** = about 3.2 km;

1 **chavukálu** = about 7¼ janas = about 1.8 m.

Units of Dry Capacity

For grains in Chicacole, Guntur, and Masulipatam (present-day Machilipatnam), based on [JERV]

					Metric
Madras garce					4896.996 L
80	Calingapatam garce				61.130 L
2400	30	pootty			2.040 L
48,000	600	20	toom		3.056 L
192,000	2400	80	4	addah	764.13 mL

For grains at Machilipatam

				Metric
seer				1.183 2 L
2	solah			591.6 mL
4	2	arsolah		295.8 mL
8	4	2	giddah	147.9 mL

For grains in Narsapur, Peddavura, and Rajahmundry

								Metric
Madras garce								4896.996 L
3	Coringa garce							1632.332 L
60	20	coonchum						81.617 L
120	40	2	uddah					40.808 L
240	80	4	2	mauneeka				20.404 L
480	160	8	4	2	towah			10.202 L
960	320	16	8	4	2	soluh		5.101 L
1920	640	32	16	8	4	2	urdsoluh	2.550 L
3840	1280	64	32	16	8	4	2	gidday 1.275 L

For grains in Kadapa and some parts of Nellore

khundee or pooftee					
40	toom				
80	2	yersa			
160	4	2	cooncha		
320	16	8	4	moonrah	
2240	56	28	14	3½	seer

For grains at bazaars in Nellore

candy or putti									
2	pandum								
4	2	yedum							
20	10	5	tum						
40	20	10	2	irasa					
80	40	20	4	2	kuncham				
320	160	80	16	8	4	munta			
1120	560	280	56	28	14	3½	seer		
8960	4480	2240	448	224	112	28	8	navattak	
17,920	8960	4480	896	448	224	56	16	2	chatak

For grains in villages in Nellore

kuncham					
4	munta				
8	2	Manika			
16	4	2	tavva		
32	8	4	2	sola	
256	64	16	8	4	gidda

For grains in Vizianagaram

					Metric
garce					4896.996 L
80	candy				61.130 L
1600	20	coonchum			3.056 5 L
6400	80	4	mauneeka		764.12 mL
12,800	160	8	2	seer	382.06 mL

For grains in Telangana, based on [JERV]

								Metric
gerise or garce								4896.927 L
20	puti							244.846 L
400	20	tumi						12.242 L
800	40	2	cunthade					6.121 L
1600	80	4	2	addidu				3.061 L
3200	160	8	4	2	mankedd			1.530 L
6400	320	16	8	4	2	tuvedú		765.14 mL
12,800	640	32	16	8	4	2	solud	382.57 mL
51,200	2560	128	64	32	16	8	4	giddedoo 95.64 mL

Traditional system for grain, based on [WILS]

అడద				Metric
adda ^a				1744 L
2	mānik			872 L
16	8	khāri		109 L
256	128	16	droṇa	6.8 L

^aA Telugu name for this unit of measure

Some other traditional measures:

1 **chdredu** = an open handful;

1 **guppedu** or **pidikedu** = a closed handful.

25.27.1 Units of Weight

At Golkonda during the late eighteenth century, based on [GREG]

				Metric
furatelle				850.5 g
2 ¹ / ₁₀	rotolo			405.0 g
179 ¹ / ₂₀	85 ¹ / ₂	metical		4.74 g
2394	1140	13 ¹ / ₃	mangalis or magelin ^a	355 mg

^aFor diamonds and precious stones

At Hyderabad

								Metric
pullah ^a								111.643 kg
1 ¹ / ₃₀	pullah ^b							108.042 kg
3 ¹ / ₁₀	3	maund "pucka" ^c						36.014 kg
10 ¹ / ₃	10	3 ¹ / ₃	maund "kucha"					10.804 2 kg
24 ¹ / ₅	24	8	2 ² / ₅	pusseree or viss				4.501 75 kg
124	120	40	12	5	seer ^d			900.350 g
1984	1920	640	192	80	16	chittack		56.271 9 g
9920	9600	3200	960	400	80	5	roupie	11.254 4 g

^aFor buying

^bFor selling

^cUsed by the Mogols and black people from Hyderabad. According to [DOUR] = 36.284 kg

^dAlso used for ghee

For diamonds and jewels at Hyderabad, based on [MART3]

		Metric
rutti		1.040 g
8	hubla	130 mg

For tobacco, ghee, oil, jaggery, chillies, tamarind, sugar, etc., at Masulipatam, present-day Machilipatnam

							Metric
candy							226.78 kg
20	maund						11.339 kg
160	8	viss					1.417 kg
800	40	5	seer cutcha				283.48 g
72,000	3600	450	90	pagode			3.150 g
256,000	12,800	1600	320	3 ⁵ / ₁₁	nowtauk		885.8 mg
512,000	25,600	3200	640	7 ¹ / ₁₁	2	chattauck	442.9 mg

For general trading at Masulipatam, present-day Machilipatnam

									Metric
candy									255.12 kg
20	maund								12.756 kg
160	8	viss							1.594 kg
800	40	5	seer cutcha						318.9 g
12,000	600	75	15	neve					
18,000	900	112½	22½	1½	dabou				
	3600	450	90			pagode			
			320			3⅞ ₁₁	nowtauk		
			640			7⅞ ₁₁	2	chattauck	

For mercantile use in general at Masulipatam, present-day Machilipatnam

			तोला		Metric
maund					11.338 6 kg
32	seer				354.330 g
40	1¼	(small) seer			283.464 g
960	30	24	tola or roupie		11.811 g
3200	100	80	3⅓	pagode	3.543 g

For brass, copper and tutenag (crude zinc) at Masulipatam, present-day Machilipatnam

					Metric
maund					10.204 8 kg
8	vis				1.275 6 kg
40	5	seer			255.120 g
320	40	8	nowtank		31.89 g
640	80	16	2	chittack	15.945 g

For oil, tamarind, sugar, iron and thin at Masulipatam, present-day Machilipatnam

				Metric
vis				1.417 3 kg
40	nowtank			35.433 g
80	2		chittack	17.716 5 g

For commercial use in Nellore

							Metric
baruva or candy							223.945 kg
20	maund						11.197 kg
160	8	viss					1.400 kg
800	40	5	seer				279.931 g
6400	320	40	8	pollam			34.991 g
19,200	960	120	24	3	tola		11.664 g
64,000	3200	400	80	10	3⅓	kanack pagoda	3.499 g

For cotton at Masulipatam, present-day Machilipatnam

				Metric
maund				10.885 12 kg
32	seer			340.160 g
40	1¼	(small) seer		272.128 g

For commerce with people from Calcutta and Hayderabad at Masulipatam, present-day Machilipatnam

					Metric
maund					12.756 kg
8	vis				1.594 5 kg
40	5	seer			318.896 g
320	40	8	nowtank		39.862 5 g
640	80	16	2	chittack	19.931 25 g

For traders at Masulipatam, present-day Machilipatnam

					Metric
maund					36.283 6 kg
8	viss				4.535 45 kg
40	5	seer			907.090 g
320	40	8	nowtank		113.386 25 g
640	80	16	2	chittack	56.693 125 g

For gold and silver in Nellore

								Metric
seer								279.931 g
24	tola							11.664 g
81	$3\frac{3}{8}$	pagoda or hun						1.728 g
162	$6\frac{3}{4}$	2	mada					863.985 mg
324	$13\frac{1}{2}$	4	2	pavu				431.993 mg
648	27	8	4	2	cavalam			215.996 mg
1296	54	16	8	4	2	dugalam		107.998 mg
2592	108	32	16	8	4	2	beda^a	53.999 mg

^aSeed of *Guruvinda ginja*

At Secunderabad

								Metric
pullah^a								114.513 8 kg
$1\frac{1}{20}$	pullah^b							109.060 8 kg
$3\frac{3}{20}$	3	maund						36.353 6 kg
$10\frac{1}{2}$	10	$3\frac{1}{3}$	(small) maund					10.906 1 kg
$29\frac{7}{5}$	24	8	$2\frac{7}{5}$	pusseree				4.544 2 kg
147	120	40	12	5	seer			908.840 g
2352	1920	640	192	80	16	chittack		56.802 5 g
11,760	9600	3200	960	400	80	5	roupie	11.360 5 g

^aFor buying

^bFor selling

For corals and pearls in Visakhapatnam

		Metric
katanji		4.354 g
12	mañjāḍi	362.87 mg

For gold and silver at Masulipatam, present-day Machilipatnam

				Metric
seer				278.400 g
~17.079	chwall			16.300 g
80	~4.684	pagode		3.480 g
720	~42.155	9	chunan	386.67 mg

Some other reported measures:

- 1 **cinnamu** (for diamonds in East Godavari)
= 635 mg;
- 1 **mañjāḍi** (for diamonds at Chittoor)
= 317.5 mg.

25.28 Assam

During the thirteenth century, a tribal leader called Chaolung Sukaphaa, with about 9000 followers, left the Shan States of Northern Burma and carved out the Ahom Kingdom in upper Assam. The kingdom gradually increased its extent over the following centuries, particularly during the reign of King Suhungmung (1497–1539). The Burmese conquered the whole of Assam in late 1821. The British drove the Burmese from Assam in 1824, and in 1826, the area came under British East India control.

Main sources: Assam District Gazetteers

Currency

In Goalpara:

1 buri = 5 ganda = 20 kauri

1 kauri or cowrie shell = 3 kránti = 4 kág = 9 dánti = 80 til

Units of Quantity

1 **kahán** (in Nowgong) = 1,280;

1 **pan** (in Nowgong) = 80;

1 **burí** (in Nowgong) = 20;

1 **gandá** (in Nowgong) = 4.

Units of Length

During the mid-nineteenth century, it was reported that the Khasi and Jaintia Hills people had no specific unit for distances. Instead, distance was measured by the number of pans a man could chew in the course of a journey, generally about one every half hour. Land was measured by a stick called a *ka diengnong*, varying in

length from six to seven cubits. In the Naga Hills, distance was measured by the number of nights a man had to sleep during a trip until he reached his destination.

In Cachar

		Metric
nál		7.62 m
16	háth	476.25 mm

In Darrang

			Metric
dín^a			~43.4 km
~2	belá		~22.5 km
~ 3½	~2	prahar	~11.3 km

^aA day's journey

In Darrang

					Metric
tár					3.505 2 m
1½	bist				3.067 05 m
4	3½	gaz			876.3 mm
8	7	2	háth		438.15 mm
192	168	48	24	angula	18.26 mm

In Goalpara

									Metric
yojan									7315.20 m
4	kos								1828.80 m
8	2	tál							914.4 m
8,000	2000	1000	dhanu						914.4 mm
16,000	4000	2000	2	gaz					457.2 mm
32,000	8000	4000	4	2	háth				228.6 mm
64,000	16,000	8000	8	4	2	bigát			114.3 mm
192,000	48,000	24,000	24	12	6	3	muti		38.1 mm
768,000	192,000	96,000	96	48	24	12	4	anguli	9.525 mm
2,304,000	576,000	288,000	288	144	72	36	12	3	jab 3.175 mm

For cloth in Goalpara

				Metric
gaz				914.4 mm
2	háth			457.2 mm
16	8	girá		57.15 mm
48	24	3	angula	19.05 mm
144	72	9	3	jab 6.35 mm

Units of Area

In Cachar

		Metric
hál or kúl bá		19,493.450 m ²
12	kheár	1624.454 m ²

Before 1852 in Darrang

					tár ²	Metric
purá					400	4914.571 m ²
4	don				100	1228.643 m ²
20	5	káthá			20	245.728 m ²
400	100	20	lessá		1	12.286 m ²
1600	400	80	4	korá	¼	3.072 m ²

In Goalpara

								Metric
bighá								1337.804 m ²
20	káthá							66.890 m ²
320	16	chhaták						4.181 m ²
1600	80	5	háth					83.613 dm ²
3200	160	10	2	bigát				41.801 dm ²
9600	480	30	6	3	muti			13.935 dm ²
38,400	1920	120	24	12	4	anguli		3.484 dm ²
115,200	5760	360	72	36	12	3	jab	1.161 dm ²

Alternative scale in Goalpara

		Metric
bishi		26,756.075 m ²
20	don	1337.804 m ²

In Hábrághát

		Metric
páká hál		46,087.346 m ²
2	káchhá hál	23,043.673 m ²

In Khuntághát

		Metric
hál		23,010.224 m ²
16	ánná	1438.139 m ²

In Kamrup

					Metric
purá					4912.9 m ²
4	dun				1228.2 m ²
20	5	káthá			245.6 m ²
400	100	20	lechá		12.28 m ²
1600	400	80	4	korá	3.07 m ²

Units of Dry Capacity

Dry commodities were usually measured by weight.

For grain in the tract to the west of the Bhairaví river

					Metric
dhol					22.312 kg
3	purá				7.439 kg
12	4	don			1.860 kg
24	8	2	ser		929.86 g
48	16	4	2	kathiá	464.93 g

For grain in the area east of the Bhairaví river

				Metric
purá				13.948 kg
3	don^a			4.649 kg
15	5	ser or her		929.86 g
30	10	2	kathiá	464.93 g

^aIt was called **tangkaton** by the Karbi people, and **rangdon** by the Dimasa people. 1 rangdon was reported as equal to 3 seers

In Cachar

				Metric
káti				115.212 g
1⅓	¾káti			86.409 g
2	1½	½káti		57.606 g
4	3	2	¼káti	28.803 g

The **káti** was an oval-shaped basket measuring 16 angúlís in heights and 12 angúlís in diameter across the top

For grain in Goalpara

							Metric
maund							37.324 kg
8	pasuri						4.665 kg
40	5	ser					933.1 g
160	20	4	poyá				233.3 g
800	100	20	5	chhaták			46.6 g
3200	400	80	20	4	káchá		11.7 g
12,800	1600	320	80	16	4	sikki	2.9 g

For grain in Nagaon

			Metric
purá			13.608 kg
3	Don		4.536 kg
30	10	káthá	453.6 g

Other measures reported during the nineteenth century:

In the Khasi and Jaintia Hills, rice, beans, potatoes and similar commodities were measured in baskets, varying in size in different markets from two to eight pounds.

Units of Liquid Capacity

Liquids were usually measured by weight.

In Goalpara

					Metric
maund					37.324 kg
40	ser				933.1 g
160	4	poyá			233.3 g
640	16	4	chhaták		58.3 g
3200	80	20	5	sikki	11.7 g

Other measures reported during the nineteenth century:

During the mid-nineteenth century, it was reported that people in the Khasi and Jaintia Hills measured liquids in gourds of different measure, varying in weight from half a chhaták to a ser, and also in bamboo tubes.

Units of Weight

In Darrang

				Imperial	Metric
man or maund				82 lbs	37.194 kg
40	ser			—	929.86 g
160	4	poyá		—	232.47 g
3200	80	20	tolá	—	11.62 g

In Eastern Dwars

										Metric
Bis										93.287 575 kg
2½	maud									37.315 030 kg
5	2	pura								18.657 515 kg
20	8	4	don							4.664 379 kg
100	40	20	5	ser						932.876 g
133⅓	53⅓	26⅔	6⅔	1⅓	káchhá ser					699.657 g
200	80	40	10	2	1½	káthá				466.438 g
400	160	80	20	4	3	2	poyá			233.219 g
1600	640	320	80	16	12	8	4	chatták		58.305 g
8000	3200	1600	400	80	60	40	20	5	tolá	11.661 g

In Kamrup

					Imperial	Metric
man or maund					82 lbs	37.194 kg
40	ser				–	929.86 g
160	4	poyá			–	232.47 g
640	16	4	chatták		–	58.12 g
2560	64	16	4	káchhá	–	14.53 g

In Nagaon

								Imperial	Metric
man or maund								82 lbs	37.194 kg
40	ser							—	929.85 g
160	4	poyá						—	232.46 g
640	16	4	chatták					—	58.12 g
2560	64	16	4	tóla				—	14.53 g
12,800	320	80	20	5	máshá			—	2.906 g
51,200	1280	320	80	20	4	chharatiá		—	726 mg
307,200	7680	1920	480	120	24	6	rati	—	121 mg

For gold and silver in Goalpara

							Metric
mohar							11.663 8 g
16	rupee						728.988 mg
32	2	ádhálí					364.494 mg
64	4	2	sikki				182.247 mg
256	16	8	4	ánná			45.562 mg
1536	96	48	24	6	rati		7.594 mg
6144	384	192	96	24	4	dhán	1.898 mg

Units of Time

In most parts of the Assam

										Metric
batsár ^a										
12	mas ^b									
24	2	pakshá								
51⅔	4⅔	2⅔	sapthaha ^c							
360	30	15	7	dibá ^d						1440 minutes
1 440	120	60	28	4	belá					360 minutes
2 880	240	120	56	8	2	praha				180 minutes
21 600	1 800	900	420	60	15	7½	danda			24 minutes
1 296 000	108 000	54 000	25 200	3600	900	450	60	pal		24 seconds
77 760 000	6 480 000	3 240 000	1 512 000	216 000	54,000	27,000	3600	60	bipal	2/5 second

^aA year^bA month^cA week^dOne day and one night

25.29 Bihar

In 1576, this area was annexed to the Mughul Empire. In 1764, Bihar became part the Bengal Presidency of the British Raj, and remained so until 1912, when it became a separate province of India.

Units of Area

1 **bigha** (at Tirhut) = 20 20 lugees = 4900 sq yd = 4096.9 m² or 20 20 small lugees = 3906¼ sq yd = 3266.0 m²;

1 **bigha** (at Patna) = 20 20 cutahs or bamboos = 3025 sq yd = 2529.2 m²;

1 **bañri** (in Bahar) = a land measure.

Units of Weight

1 **maund** (in Patna) = 39.175 kg;

1 **seer** (in Patna) = 947.39 g, 932.75 g, 887.13 g, 853.96 g, 840.68 g, 559.87 g, and 526.18 g;

1 **tola** (in Patna) = 13.542 g;

1 **roupie** (in Patna) = 11.641 g;

1 **ruttee** (in Patna) = 197 mg.

25.30 Damao

This city was captured by the Portuguese in 1559, and annexed to India in 1962.

Currency

–1854: 1 Indian rupia = 2 xerafins or pardaos = 10 tangas = 600 réis = 750 bazarucos

I have not found any data directly related to this area.

25.31 Diu

The Portuguese settled here in 1535, and the district was annexed to India in 1962.

Currency

–1859: 1 Indian rupia = 10 tangas = 40 atias = 600 réis = 750 bazarucos

I have not found any data directly related to this area.

25.32 Goa

The city was taken by Albuquerque in 1510, and annexed to India in 1962.

Currency

–1869: 1 Indian rupia = 2 xerafins or pardaos = 10 tangas = 480 réis = 768 bazarucos

Units of Length

1 **côvado** or **cobido** = 680.6 mm.

Units of Capacity

1 **medida** = for the sale of liquids and grains, equal to the weight of the 24th part of a maund = 467.720 g.

Units of Dry Capacity

Traditional system, based on [MART3]

						Metric
cumbo						9866.673 600 L
20	candil					493.333 680 L
400	20	curo				24.666 684 L
800	40	2	chouto			12.333 342 L
3200	160	8	4	pori		3.083 335 L
9600	480	24	12	3	medida	1.027 778 L

British Imperial scale

							Metric
curo							24.666 684 L
2	chouto						12.333 342 L
8	4	pori					3.083 335 L
16	8	2	nacti				1.541 668 L
32	16	4	2	anati			770.834 mL
64	32	8	4	2	guernati		385.417 mL
128	64	16	8	4	2	salaveme	192.708 mL

For grain in Bardez, Bicholim, Cabo da Rama, Canacon, Pernem, and Sanquelim

								Metric
khundee								973.44 L
20	mun							48.67 L
60	3	cooroo						16.22 L
120	6	2	pylee					8.11 L
480	24	8	4	pud or medida				2.028 L
960	48	16	8	2	solge			1.014 L
1920	96	32	16	4	2	arnatee		507 mL
3840	192	64	32	8	4	2	geernatee	253.5 mL

For rice

								Metric
koruj								1703.52 L
1¼	khundee							973.44 L
3½	2	bhurra						486.72 L
14	8	4	koodalee khundee					121.68 L
35	20	10	2½	parah				48.67 L
42	24	12	3	1½	morah			40.56 L
280	160	80	20	8	6⅔	cooroo		6.084 L
560	320	160	40	16	13⅓	2	pylee	3.042 L

Units of Weight

Upper arroba scale for general use

						Metric
candar						220.285 kg
$3\frac{3}{4}$	quintal					58.743 kg
15	4	arroba				14.686 kg
20	$5\frac{1}{3}$	$1\frac{1}{3}$	mao			11.014 25 kg
80	$21\frac{1}{3}$	$5\frac{1}{3}$	4	dora		2.753 56 kg
480	128	32	24	6	arratel or livre	458.927 g

Lower arroba scale for general use

						Metric
arratel or livre						458.927 g
2	marco					229.463 g
16	8	onça				28.683 g
128	64	8	outava			3.585 g
384	192	24	3	escropulo		1.195 g
9216	4608	576	72	24	grão	49.8 mg

Maund scale for general use

					Metric
bahar or candy					224.506 kg
20	maund				11.225 3 kg
480	24		rattle or rottole		467.720 g

Scale based on [MART3]

											Metric
candil											220.102 560 kg
$1\frac{1}{4}$	bahar										205.429 056 kg
$3\frac{3}{4}$	$3\frac{1}{2}$	quintal									58.694 016 kg
20	$18\frac{2}{3}$	$5\frac{1}{3}$	mao								11.005 128 kg
80	$74\frac{2}{3}$	$21\frac{1}{3}$	4	dora							2.751 282 kg
480	448	128	24	6	arratel						458.547 g
960	896	256	48	12	2	marco					229.274 g
7680	7168	2048	384	96	16	8	onça				28.659 g
61,440	57,344	16,384	3072	768	128	64	8	outava			3.582 g
184,320	172,032	49,152	9216	2304	384	192	24	3	scrupulo		1.194 g
4,423,680	4,128,768	1,179,648	221,184	55,296	9216	4608	576	72	24	grao	49.7 mg

For gold and silver

		Metric
metical		2.388 266 g
48	grao	49.7 mg

For fine use

		Metric
karat		207.3 mg
5	chegos	41.46 mg

25.33 Gujarat

From 1818 to 1947, most of the area was divided into hundreds of princely states, but Ahmedabad, Broach, Kaira, Panchmahal and Surat were ruled directly by British officials. In 1947, the Indian government grouped the former princely states of Gujarat into three larger units: Bombay state, Kutch and Saurashtra. In 1956, Bombay state was enlarged to include Kutch, Saurashtra, and parts of Hyderabad state and Madhya Pradesh. The Bombay state was divided into Gujarat and Maharashtra in 1960.

Currency

–1948: 1 kori = 24 dokda = 48 trambiyō

Units of Quantity

1 **corge** = 20.

Units of Length

British Imperial-linked system used in Suryapur, present-day Surat

				Metric
yard				0.914 392 m
1½	gus or guz			609.595 mm
2	1⅓	covid		457.196 mm
36	24	18	tussoo	25.400 mm

Other reported measures:

- 1 **coss** = 11,112.062 222 m;
 1 **bāṇṣ**, **bann**, **baṇṣ**, or **buns** (for surveying)
 = varying by location between 7 ft 5⅓ in and 20 f. 5¼ in = 2.276 m and 6.229 m;
 1 **guz** (at Anjar) = 670.55 mm.

Units of Area

British Imperial-linked system at Bharuch

बीघा			Imperial	Metric
bigha or bheega			3025 sq yd	2529.2 m ²
20	wusa		151¼ sq yd	126.5 m ²
440	22	wuswassa	–	5.75 m ²

At Khandesh

		बीघा
Dooree		
20	purtun	
80	4	bigha or bheega

Other reported measures:

- 1 **bigha** or **bheega** (traditional system in Ahmedabad, Kheda, and Surat Collectorate) = 8231.0 m²;
 1 **bigha** or **bheega** (traditional system in Amod, Jambusar, and Dehej Parganas) = 3880.4 m²;
 1 **bigha** or **bheega** (traditional system in Gandhinagar) = 20 20 gunthas = 2312.5 m²;
 1 **bigha** or **bheega** (traditional system in Bharuch, Unklesur, and Hausot Parganas) = 2071.7 m².

Units of Dry Capacity

Cereals were generally sold by weight.

For solids at Anjar

				Metric
culsey				497.51 L
16	shye			31.094 L
64	4	mapp		7.774 L
512	32	8	pallee	971.70 mL

Units of Liquid Capacity

Liquid capacity was generally measured by weight.

Units of Weight

1 **maund** (at Paichal) = 20.523 kg;

1 **maund** (for bazaars at Jambusar) = 42 seer = 19.234 kg;

1 **maund** (for rubber) = 44 sihrs = 18.680 759 kg;

1 **maund** (for sugar tablets) = 43¼ sihrs = 18.362 337 kg;

1 **maund** (for liquor, butter, cottonseed oil and cuckoonuts) = 42 sihrs = 17.831 633 kg;

1 **maund** (at Bohare) = 17.702 kg;

1 **maund** (for natural sugar) = 41 sihrs = 17.407 071 kg;

1 **maund** (at Bulsar) = 17.221 kg;

1 **maund** (at Koombhareea) = 17.121 kg;

1 **maund** (for castor oil and saffron) = 40¼ sihrs = 17.088 649 kg;

1 **maund** (at Bugwaraa) = 16.561 kg;

1 **maund** (for cotton at Anjar) = 14.275 kg;

1 **pusseree** (at Bugwara and Bulsar) = 2.126 kg;

1 **seer** (at Ahmedabad) = 479.23 g.

For wheat

		Metric
parah		34.015 kg
20	pahli or pally	1.700 75 kg

For gold and silver

	तोला					Metric
seer						424.562 700 g
35	tola					12.130 363 g
420	12	massa				1.010 864 g
1120	32	2⅔	val			379.073 84 mg
3360	96	8	3	rottih		126.357 95 mg
20,160	576	48	18	6	chonvel	21.059 66 mg

For diamonds and pearls

			Metric
tank			3.032 591 g
24	rottih or ruttee		126.357 958 mg
480	20	wassa	6.317 897 mg

For general use at Ahmedabad

		तोला			Metric
maund					19.169 kg
40	seer				479.230 g
1530	38¼	tola			12.530 g
48,960	1224	32	vall		391.56 mg
146,880	3672	96	3	ruttee	13.05 mg

For cotton at Ahmood

				Metric
candy				396.08 kg
20	maund			19.804 kg
840	42	seer		471.5 g

Two reported systems for kuppra and grains at Ahmood

			Metric	Metric
candy			368.02 kg	377.22 kg
20	maund		18.401 kg	18.861 kg
800	40	seer	460.025 g	471.525 g

Two reported systems for general use at Anjar

				Metric	Metric
maund				11.896 kg	12.346 kg
4	dus-serrah			2.974 kg	3.086 kg
40	10	seer		297.400 g	308.655 g
1440	360	36	dokra	8.261 g	8.574 g

For cotton and iron at Anjar

		Metric
maund		14.242 kg
48	seer	296.7 g

For gold and silver at Anjar

		Metric
guddiana		5.805 g
16	vall^a	362.8 mg

^aAlso reported as 364 mg

At Baroda

			Metric
candy de Pergunnah			404.60 kg
20	maund		20.23 kg
840	42	seer de Pergunnah	481.7 g

At Baroda

			Metric
candy de ville			394.96 kg
20	maund		19.75 kg
840	42	seer de ville	470.2 g

For sesame seeds at Baroda

			Metric
candy			385.33 kg
20	maund		19.27 kg
800	40	seer de ville	481.7 g

For general use at Bharuch

				Metric
candy				372.616 kg
20	maund			18.630 8 kg
810	40½	seer		460.020 g
32,400	1620	40	roupie	11.500 5 g

Alternative mercantile system at Bharuch

				Metric
candy				368.02 kg
20	maund			18.401 kg
800	40	seer de ville		460.025 g
32,000	1600	40	roupie	11.500 6 g

For oil and city at Bharuch

			Metric	Metric
candy			404.60 kg	394.96 kg
20	maund		20.23 kg	19.748 kg
840	42	seer	481.7 g	470.2 g

For cottons at Bharuch

				Metric
candy				396.078 kg
20	maund			19.803 9 kg
820	41	seer		483.021 g
34,440	1722	42	roupie	11.500 5 g

For sesame seeds at Bharuch

				Metric
candy				385.33 kg
20	maund			19.266 kg
800	40	seer		481.66 g

Scale used by the mupparahs (or grain weighers) at Bharuch

				Metric
candy				372.616 kg
20	maund			18.630 8 kg
800	40	seer		465.770 g
32,400	1620	40½	roupie	11.500 5 g

For grains, except sesame seeds, at Bharuch

				Metric
candy				377.216 kg
20	maund			18.860 8 kg
800	40	seer		471.520 g
32,800	1640	41	roupie	11.500 5 g

For castor oil at Bharuch

				Metric
candy^a				386.416 kg
20	maund			19.320 8 kg
800	40	seer		483.021 g
33,600	1680	42	roupie	11.500 5 g

^aSaid to equal 454 L

For ordinary use and two scales used at the pergunnah settlements at Hansot

			Metric	Metric	Metric
candy			350.08 kg	358.14 kg	355.73 kg
20	maund		17.504 kg	17.907 kg	17.786 kg
800	40	seer	437.610 g	447.670 g	444.662 g

For oil at Hansot

			Metric
candy^a			367.59 kg
20	maund		18.38 kg
840	42	seer	437.6 g

^aReported to equal 433.58 L

For general use, mercantile use and solid goods at Jalapore

		Metric	Metric	Metric
maund		38.408 8 kg	18.318 kg	18.779 kg
40	seer	960.220 g	457.950 g	469.480 g

For mercantile use and scale used at the pergunnah settlements at Jumboosur

			Metric	Metric
candy			366.36 kg	375.59 kg
20	maund		18.318 kg	18.779 kg
800	40	seer	457.95 g	469.49 g

For cotton at Jumboosur

			Metric
candy			384.68 kg
20	maund		19.234 kg
840	42	seer	457.95 g

Mercantile system at Suryapur, present-day Surat

							Metric
bhar, behar, or bahar							407.580 192 kg
1 $\frac{1}{7}$	harra						356.632 668 kg
1 $\frac{1}{5}$	1 $\frac{1}{20}$	candy					339.650 160 kg
2	1 $\frac{3}{4}$	1 $\frac{2}{3}$	mahnih or maunee				203.790 096 kg
3 $\frac{3}{7}$	3	2 $\frac{2}{7}$	1 $\frac{1}{7}$	(small) harra			118.877 556 kg
24	21	20	12	7	maund or mun^a		16.982 508 kg
960	840	800	480	280	40	sihr or seer	424.562 7 g

^a 1 **mun** (for oil, butter, cotton and cocoanuts) = 42 seers = 17.831 633 kg, and for other commodities varying between 40 and 46 seers

For cereals at Suryapur, present-day Surat

		Metric
parah		34.02 kg
20	pally or pahli	1.701 kg

Traditional system and metric-linked system for fine use and pearls at Suryapur, present-day Surat

					Metric	Metric
tank					3.032 591 g	3 g
24	ruttee				126.36 mg	125 mg
96	4	quarter			31.59 mg	31.25 mg
384	16	4	ama		7.90 mg	7.81 mg
480	20	5	1 $\frac{1}{4}$	wassa	6.32 mg	6.25 mg

For gold and silver at Suryapur, present-day Surat

		तोला			Metric
val					1.273 688 kg
3	seer				424.562 7 g
105	35	tola			12.130 36 g
1260	420	12	massa		1.010 86 g
10,080	3360	96	8	ruttee	126.4 mg

For ordinary use at Vadodara

				Metric
candy				404.611 kg
20	maund			20.230 kg
840	42	seer		481.680 g
35,280	1764	42	roupie	11.469 g

Scale used in the city at Vadodara

				Metric
candy				394.968 kg
20	maund			19.748 kg
840	42	seer		470.200 g
34,440	1722	41	roupie	11.468 g

For sesame seeds at Vadodara

			Metric
candy			385.330 kg
~5,423	maund		52.611 kg
33,600	~4587.635	roupie	11.468 g

25.34 Chhattisgarh

Units of Dry Capacity

In Sawunt warree state

					Metric
khundee					1224.249 L
2	bhurra				612.124 L
20	10	phura			61.212 L
160	80	8	kooroo		7.651 L
320	160	16	2	pylee	3.826 L
1280	640	64	8	4	seer 956.44 mL

25.35 Himachal Pradesh

Units of Area

1 **bigha** or **bheega** (at Dharamshala) = 2503.7 m².

25.36 Jammu and Kashmir

Main source: [CROO]

Units of Length

Upper scale, based on table compiled by [CROO]

						Metric
nyi-ma-nyis-y-lam^a						~40 km
2	nyi-ma-chik-y-lam^b					~20 km
4	2	lam-phet^c				~10 km
5	2½	1¼	dpag-tshad			~8 km
13⅓	6⅔	3⅓	2⅔	mig-thong^d		~3 km
40	20	10	8	3	gyan-tak^e	~1 km
20,000	10,000	5000	4000	1500	500	dom.pa^f ~2 m

^aTwo day's journey by foot

^bOne day's journey by foot

^cHalf a day's journey. Also **tsha-lam** or **zan-lam**

^dAs far as a man can be seen

^eAs far as a monastic conch can be heard

^fThe span between the tip of the fingers on the right hand and the tip of the fingers on the left hand, when arms are stretched out

Also **domgang**

Lower scale, based on table compiled by [CROO]

												Metric
dom.pa												~2 m
	kom.ba^a											~750 mm
		thu^b										~450 mm
			skang-gang^c									~350 mm
				tho^d								~200 mm
					pi-tho^e							~150 mm
						lak-pa^f						~110 mm
20							chut-gang^g					~100 mm
25				2½			1¼	sor-zi^h				~80 mm
100	37½	22½	17½	10	7½	5½	5	4	sorⁱ			~20 mm
200	75	45	35	20	15	11	10	8	2	senmo^j		~10 mm

^aA pace

^bThe span between the elbow and the tip of the middle finger

^cThe span between the elbow and the knuckle

^dThe span between the tip of the thumb and the tip of the little finger

^eThe span between the tip of the thumb and the tip of the forefinger

^fThe width of five fingers

^gThe width of a closed hand

^hThe width of four fingers

ⁱThe width of a finger

^jThe width of a fingernail

25.37 Karnataka

This state was established in 1956 as the State of Mysore, but was renamed Karnataka in 1973.

Main sources: [DOUR] and [WILS]

Currency

1 rupee = 4 pavalis = 16 annas = 32 fanams

1 Canteria pagoda = 10 fanams = 160 cash

1 Star pagoda = 45 fanams

1 Bahadre pagoda = 46 fanams and 29 cash

Units of Area

In Konkan

बीघा				Metric
bigha or bheega				1538.6 m ²
23	pand			66.9 m ²
460	20	poluh		3.34 m ²
9200	400	20	square cathee	16.7 dm ²

Other reported measures:

1 **koorge** (in Dharwar) = as much land as could be sown with a drill plough in one day = varied between 2 and 8 bheegas.

Units of Dry Capacity

At Belgaum

						Metric
candy						2862.4 L
20	koora					143.12 L
480	24	payebbee				5.963 L
960	48	2	adholee or demic			2.982 L
1920	96	4	2	pawaa or seer		1.491 L
15,360	768	32	16	8	kalary	186.35 mL

At Aukola, Barkur, Bekul, Buntwal, Honawur (present-day Honore), Kundapur, Mangalore, and Soopah

koruj				
42	morah			
126	3	kulsec		
1764	42	14	harray	
3528	84	28	2	shedy

Scale that was customary for all that relates to transactions and administrative in the accounts of government

			Metric	Metric
candy			230.02 kg	226.77 kg
20	maund		11.501 kg	11.338 kg
840	42	seer	273.833 g	269.964 g

Other reported measures:

1 **addana** = about 280 mL;

1 **balla** or **bullā** = 48 double handfuls = about 2 seers.

Units of Weight

Scale used in Mysore county during British rule

garce			
	batty		
	1½	morah	
521	60	40	seer-pucca

At Ankola

			Metric
maund^a			35.765 kg
32	seer		1.117 g
3200	100	roupie	11.176 g

^aFor cooking oil and indigo dye. 1 **maund** (for ordinary use) = 11.896 kg

For general use at Bangalore

						Metric
candagon or candy						219.07 kg
20	maund					10.95 kg
80	4	duddah				2.738 kg
160	8	2	punjseer or vis			1.369 kg
480	24	6	3	rattle		456.40 g
800	40	10	5	$1\frac{2}{3}$	seer-cutcha	273.84 g

For cereals at Bangalore

										Metric
garce										4600.5 kg
30	candy or kistuaraz candagon									153.35 kg
400	$13\frac{1}{3}$	mercal								11.501 kg
600	20	$1\frac{1}{2}$	coodom or kistuaraz colagah							7.67 kg
2400	80	6	4	kistuaraz bullah						1.92 kg
4800	160	12	8	2	seer pucka					958.4 g
16,800	560	42	28	7	$3\frac{1}{2}$	seer cutcha				273.8 g
19,200	640	48	32	8	4	$1\frac{1}{7}$	powe			239.6 g
38,400	1280	96	64	16	8	$2\frac{2}{7}$	2	adpowe		119.8 g
76,800	2560	192	128	32	16	$4\frac{4}{7}$	4	2	chattack	59.9 g
403,200	13,440	1008	672	168	84	24	21	$10\frac{1}{2}$	$5\frac{1}{4}$	roupie 11.4 g

For fine use at Bangalore

					Metric
roupie					11.409 g
$3\frac{1}{3}$	pagode				3.422 7 g
30	9	canteroy			380.3 mg
120	36	4	groometrie		95.07 mg
480	144	16	4	small grain of paddy	23.77 mg

Governmental scale for rice at Bangalore

			Metric
candy			230.02 kg
20	maund		11.501 kg
840	420	seer	27.38 g

For general use at Belgaum

					Metric
candy					238.10 kg
20	maund				11.905 kg
80	4	dhuddy			2.976 kg
880	44	11	seer		270.570 g
21,120	1,056	254	24	roupie	11.273 75 g

Upper scale at Bellary

									Metric
pullah									62.700 kg
5¼	seer^a								11.942 kg
5 ⁷ / ₂₀	1 ³ / ₈₀	seer^b							11.511 kg
21 ⁴ / ₅	4 ³ / ₂₀	4	duddah						2.878 kg
43 ³ / ₅	8 ³ / ₁₀	8	2	pusseree					1.438 kg
65 ² / ₅	12 ² / ₅₀	12	3	1½	seer^c				969.250 g
228 ⁹ / ₁₀	43 ²³ / ₄₀	42	10½	5¼	3½	seer^d			274.070 g
261	49 ⁴ / ₅	48	12	6	4	1½	seer^e		239.810 g
5481	1 045 ⁴ / ₅	1008	252	126	84	24	21	roupie	11.419 g

^aFor cotton^bFor general use^cFor cereals^dFor gold and silver^eFor mercantile use

For grain at Bellary, based on [DOUR]

								Metric
contagah								5016 kg
4	punchagah							1254 kg
20	5	collagah						250.8 kg
80	20	4	pullah					62.7 kg
320	80	16	4	maanah				15.67 kg
1280	320	64	16	4	sollagay			3.92 kg
3840	960	192	48	12	3	thimmapoo		1.3 kg
5120	1280	256	64	16	4	1 ¹ / ₃	giduah	0.98 kg

For fine use at Bellary

तोला					Metric
tola or roupie					11.420 g
3 ¹ / ₃	pagode				3.426 g
12	3 ³ / ₅	mas			951.7 mg
30	9	2½	canteroy or fanam		380.7 mg
90	27	7½	3	goondominie	126.9 mg

At Darwar, present-day Dharwad

					Metric
kandy or randy					223.92 kg
20	mun				11.196 kg
80	4	dhurra			2.799 kg
960	48	12	seer-cutcha		233.250 g
69,120	3456	864	72	tang	3.239 6 g

At Darwar, present-day Dharwad

		Metric
pylee		5.411 kg
4	seer-pucca	1.352 7 kg

At Karwar (two reported scales)

				Metric	Metric
candy				233.82 kg	235.84 kg
20	maund			11.691 kg	11.792 g
840	42	seer		278.357 g	280.762 g
21,000	1025	25	pice	11.13 g	11.23 g

For salt, pepper and wheat at Mangalore

			Metric
bahar			259.790 kg
20	maund		12.990 kg
435	21¼	seer	597.218 g

At Seringapatam, present-day Srirangapattana

							Metric
bahar							220.190 kg
20	maund						11.009 5 kg
160	8	paush					1.376 kg
800	40	5	seer-cutcha				275.238 g
3 657½	182½	22½	4½	chittack			60.209 g
6400	320	40	8	1¼	pollam		34.405 g
19,200	960	120	24	5¼	3	roupie	11.468 g

Kannada scale, based on [WILS]

man		
4	dadeya	
40	10	seer

Upper scale for grains

						Metric
garce						4600.50 kg
30	kistuaraz candagon					153.35 kg
400	13 $\frac{1}{3}$	mercal				11.501 kg
600	20	1 $\frac{1}{2}$	kistuaraz-colagah or coodom			7.667 kg
2400	80	6	4	kistuaraz-bullah		1.916 9 kg
4800	160	12	8	2	seer-pucca	958.44 g

Lower scale for grains

						Metric
seer-pucca						958.44 g
3 $\frac{1}{2}$	seer-cutcha					273.839 g
4	1 $\frac{1}{2}$	powa				239.609 g
8	2 $\frac{2}{7}$	2	pollum or adowe			119.805 g
16	4 $\frac{4}{7}$	4	2	chattak^a		59.902 g
84	24	21	10 $\frac{1}{2}$	5 $\frac{1}{4}$	roupie	11.41 g

^aAt Srirangapatna (for grains and milk) = 76.62 mL = 60.208 g

For fine use

						Metric
seer-cutcha						274 g
8	pollam or adpao					34.25 g
24	3	rupee				11.42 g
80	10	3 $\frac{2}{3}$	pagoda or bahadry			3.42 g
720	90	30	9	fanam, canteroy, or sultanin		380.6 mg
2160	270	90	27	3	goondoominy	126.9 mg

Other reported measures:

1 **maund** (for general use at Mangalore) = 12.804 kg;
 1 **dhura** (for selling at Haveri) = 3.491 kg;
 1 **dhura** (for buying at Haveri) = 2.817 kg;
 1 **seer** (for dry goods at Ankola) = 1.229 kg;
 1 **seer-pucca** (at Haveri) = 1.100 kg;
 1 **seer Channee** (at Beemmar) = 924.780 g;

1 **seer** (for saffron and gold at Ankola) = 877.93 g;
 1 **seer Omeree** (at Beemmar) = 791.950 g;
 1 **seer Khaus** (at Beemmar) = 656.410 g;
 1 **seer** (for buying at Haveri) = 271.150 g;
 1 **seer** (for general use at Mangalore) = 278.350 g;
 1 **seer** (for selling at Haveri) = 234.710 g;
 1 **bandi, bundee, or bandy** = unknown size;

1 **artole** or **arthole** [అత్తొల] = $\frac{1}{2}$ rupee = 5.83 g (assuming the Company rupee), or 5.67 g (assuming the traditional rupee of 175 grains).

25.38 Kerala

The Portuguese explorer Vasco da Gama visited Kerala in 1498, where he landed at Calicut. The Dutch East India Company was established in the area in the early sixteenth century. The British established themselves in Kerala in the early seventeenth century. The State of Kerala was created in 1956 by merging the territories of Cochin, Malabar, and Travancore.

Main sources: [FELN], [JERV], [MART], [SIMM], and [WAGN]

Units of Length

For general use, based on [WAGN]

			Metric
kole or koll			738.24 mm
2	covid		61.52 mm
24	12	borrel or borell ^a	30.76 mm

^aAccording to [SIMM], equal to 30.69 mm

For sawn timber and unsawn timber, based on [SIMM]

			Metric	Metric
kole or koll			914.4 mm	457.2 mm
2	covid		457.2 mm	228.6 mm
24	12	borel , borrel , or borell	38.1 mm	19.05 mm

For timber, based on [MART]

				Metric
kole or koll				711.2 mm
2	covid			355.6 mm
24	12	borel , borrel , or borell		29.63 mm
384	192	16	mogany	1.85 mm

For plank, based on [MART]

		Metric
borel , borrel , or borell		18.52 mm
10	mogany	1.85 mm

Other reported measures:

1 **angoolam** (at Trivandrum, present Thiruvananthapuram) = 30 mm.

Units of Area

For land area

				Metric
beegah ^a				2329 m ²
20	biswáh			116.5 m ²
400	20	kachwánsi		5.82 m ²
4800	240	12	aswánsi	485 dm ²
8000	400	20	1 $\frac{1}{2}$	tíswánsi 291 dm ²

^aApprox. 3600 square guz

Units of Volume

1 **guz** (for plank) = 24 12 1 borel = 1.83 dm³.

Units of Dry Capacity

For grains in Nalleppilly, based on [JERV]

									Metric
Madras garce									4896.996 L
3	Coringa garce								1632.332 L
60	20	coonchum							81.617 L
120	40	2	uddah						40.808 L
240	80	4	2	mauneeke					20.404 L
480	160	8	4	2	towah				10.202 L
960	320	16	8	4	2	soluh			5.101 L
1920	640	32	16	8	4	2	urdsoluh		2.550 L
3840	1280	64	32	16	8	4	2	gidday	1.275 L

In Cannanore, present-day Kannur, during the sixteenth century

		Metric
bornym		22.4 L
16	canada	1.4 L

At Cannanore, present-day Kannur

					Metric
candy					278.350 kg
20	maund				13.917 kg
600	30	pound			463.917 g
1200	60	2	seer		231.958 g
2400	120	4	2	pollam	115.979 g

Units of Weight

1 **pagode** (at Cochin) = 3.379 g;

1 **fanam** (at Cochin) = 377.5 mg.

At Calicut, present-day Kozhikode

					Metric
maund					15.772 9 kg
68	seer				231.954 g
136	2	pollam			115.977 g
1360	20	10	roupie		11.598 g
41,972	617 ⁴ / ₁₇	308 ²¹ / ₃₄	30 ²⁹³ / ₇₃₄₀	fanam	375.79 mg

At Cochin, present-day Kochi

		Metric
maund^a		14.787 kg
1,270½	roupie	11.641 g

^aFor sugar, spices and metals = 12.323 kg

For metals, spices and sugar at Colatchey

					Metric
candy					170.56 kg
20	maund				8.528 kg
25	1¼	toolam			6.822 kg
500	25	20	rautul		341.12 g
2500	125	100	5	pollum	68.22 g

At Cambaie

			Metric
maund			16.932 4 kg
40	seer		423.310 g
1200	30	pice	14.110 g

For commodities at Colatchey

				Metric
candy				204.67 kg
20	maund			10.234 kg
600	30	rautul		341.12 g
3000	150	5	pollum	68.22 g

At Tellicherry, present-day Thalassery

					Metric
maund					14.845 kg
32	rottolo				463.908 g
64	2	seer			231.954 g
128	4	2	pollam		115.977 g
1280	40	20	10	roupie	11.598 g

For general use at Trevandrum, present-day Thiruvananthapuram

		Metric
maund		14.888 kg
227	pollam ^a	65.585 g

^aFor cotton = 75.783 g

For groceries and sugar at Trevandrum, present-day Thiruvananthapuram

		Metric
maund		12.410 kg
175½	pollam	70.714 g

25.39 Kolhapur [Formerly: Satara and Kolhapur]

The region, then known as Satara and Kolhapur, existed as a separate state from about 1707. Between 1811 and 1853, Kolhapur concluded a series of treaties and agreements with the British Government. After the independence of India in 1947, Kolhapur acceded to the Dominion of India.

I have not found any data directly related to this area.

25.40 Madhya Pradesh

This region was dominated by the Gupta rulers from c. 275 until c. 600. The Harshvardhan Kingdom lasted from 606 until 647, when the area was

broken into several princely states, a state structure that was in force until the birth of modern India. Madhya Pradesh was formally created in 1950 from the former British Central Provinces and Berar and the princely states of Makrai and Chhattisgarh. In 1956, the states of Madhya Bharat, Vindhya Pradesh, and Bhopal were merged into Madhya Pradesh, and Vidarbha was ceded to Bombay state.

Units of Length

1 **hath** (for measuring cloth and turbands at Bagulkota) = 488.95 mm.

At Bagulkota

		Metric
guz		832.55 mm
24	tassoo	34.69 mm

Units of Area

At Malwa

बीघा		Metric
bigha		~2023 m ²
20	wusa	~101 m ²

Units of Weight

At Berasia

			Metric
maund			34.987 6 kg
8	pusseree		4.373 4 kg
40	5	seer	874.69 g

At Bhilsa, present-day Vidisha

							Metric
manissa							15,628 kg
100	maunée						156.278 kg
375	$3\frac{3}{4}$	maund					41.674 kg
3000	30	8	pusseree				5.209 kg
3600	36	$9\frac{3}{5}$	$1\frac{1}{5}$	pusseree ^a			4.341 kg
18,000	180	48	6	5	seer		868.210 g
1,440,000	14,400	3840	480	400	80	roupie	10.853 g

^aFor cereals

At Bhopal

							Metric
manissa							22,741.9 kg
100	mannée						227.419 kg
4000	40		pusseree				5.685 5 kg
26,000	260		$6\frac{1}{2}$	seer			874.690 g
2,080,000	20,800		520	80		roupie	10.933 6 g

At Dewas

				Metric
maunée				181.586 kg
12	maund			15.132 kg
$49\frac{1}{11}$	$4\frac{1}{11}$	dhurra		3.699 kg
$202\frac{1}{2}$	$16\frac{7}{8}$	$4\frac{1}{8}$	seer	896.720 g

For solid commodities at Dindore

						Metric
maund						71.531 kg
16	pylee					4.470 7 kg
32	2	adholee				2.235 4 kg
64	4	2	seer			1.117 7 kg
256	16	8	4	pao-seer		279.420 g
4608	288	144	72	18	tank	15.523 g

Ordinary scale at Dindore

				Metric
candy				679.54 kg
20	maund			33.977 kg
800	40	seer		849.420 g
12,800	640	16	chittack	53.089 g

At Indore

					Metric
maunée					220.594 kg
6	maund				36.765 6 kg
12	2	maund (small)			18.382 8 kg
48	8	4	dhurra		4.595 7 kg
240	40	20	5	seer	919.14 g

For general use at Kotar

		Metric
maund		14.888 kg
227	pollam	65.585 g

For groceries at Kotar

		Metric
maund		12.410 kg
$175\frac{1}{2}$	pollam	70.714 g

At Malwa

				तोला				Metric
maunée								220.423 kg
12	maund							18.369 kg
48	4	dhurra						4.592 kg
240	20	5	seer					918.430 g
17,904	1492	373	74 $\frac{3}{5}$	tola				12.311 g
20,160	1680	420	84	1 $\frac{47}{373}$	roupie			10.933 g
215,040	17,808	4452	890 $\frac{3}{5}$	12 $\frac{47}{373}$	10 $\frac{3}{5}$	mash		1.025 g
1,720,320	142,464	35,616	7 123 $\frac{3}{5}$	96 $\frac{32}{373}$	84 $\frac{4}{5}$	8	ruttee	128 mg

At Omutwara

								Metric
manissa								19,832.5 kg
100	maundée							198.325 kg
800	8	maund						24.791 kg
3200	32	4	dhurra					6.198 kg
6400	64	8	2	pusseree				3.099 kg
22,400	224	28	7	3 $\frac{1}{2}$	seer			885.380 g
1,814,400	18,144	2268	567	283 $\frac{1}{2}$	81	roupie or salim shyee ra		10.931 g

At Oudgein

					Metric
maunée					181.586 kg
12	maund				15.132 kg
35 $\frac{5}{23}$	2 $\frac{43}{46}$	dhurra			5.156 kg
202 $\frac{1}{2}$	16 $\frac{3}{4}$	5 $\frac{3}{4}$	seer		896.720 g
16,200	1350	460	80	roupie	11.209 g

Other reported measures:

- 1 **manisa** or **maunée** (at Berasia) = 13.995 kg;
 1 **pusseree** (for retail at Indore) = 4.668 kg;
 1 **pusseree** (at Bazaars at Indore) = 4.595 kg;
 1 **seer** (for ordinary use at Rutlam) = 863.74 g;
 1 **pollam** (for cotton at Kotar) = 75.783 g.

At Pertabghur

					Metric
maunée					208.926 kg
12	maund				17.494 kg
48	4	dhurra			4.373 kg
240	20	5	seer		874.690 g
19,200	1600	400	80	roupie	10.934 g

For purchasing and for sale at Rutlam, present-day Ratlam

				Metric	Metric
maunée				220.420 kg	209.926 kg
12	maund			18.368 kg	17.494 kg
48	4	dhurra		4.592 kg	4.373 kg
240	20	5	seer	918.42 g	874.69 g

25.41 Maharashtra

Between 230 BCE and 225 CE, the area was ruled by the Satvahana Dynasty, between 550 and 760, by the Chalukyas, and between 1189 and 1310, by Yadav from Daulatabad. The Muslim Sultan Alla-ud-din Khilji invaded the area in 1296 and defeated Yadav. Between 1658 and 1700, Shivaji created the Maratha Empire. In 1818, Marathakej Bajirao II surrendered to the British. The British possessions on India's western coast became the Land of Bombay at India's independence. The state also included a number of former vassal states. It was expanded by the area of Madhya Pradesh in 1956, but split into the two states of Gujarat and Maharashtra in 1960.

Main source: [COLE2]

Units of Length

At Dukhun

									Metric
yojun									14,630.4 m
2	guwyotee								7315.2 m
4	2	kohs							3657.6 m
10,400	5200	2600	dunooch^a						1.407 m
41,600	20,800	10,400	4	haht^b					351.7 mm
83,200	41,600	20,800	8	2	weet^c				175.8 mm
499,200	249,600	124,800	48	12	6	moostee^d			29.3 mm
998,400	499,200	249,600	96	24	12	2	boht^e		14.6 mm
7,987,200	3,993,600	1,996,800	768	192	96	16	8	juw^f	1.8 mm

^aThe width of a man's outstretched arm

^bA cubit, equal to the mean length of five men's arms measured from the elbow-joint to the tip of the middle finger

^cA span

^dA fist

^eA finger

^fA barley corn

For cloth at Dukhun

				Metric
guj				936 mm
16	ghirra			58.5 mm
24	1½	tussoo		39.0 mm
48	3	2	boht	19.5 mm

Units of Area

At Dukhun

चाहुर	रुकेह	बीघा	पांद	काठी	Metric
chahoor or chahur					341,412 m ²
20	rookeh				17,070.6 m ²
120	6	bigha or bheega			2845.1 m ²
2400	120	20	paand		142.2 m ²
48,000	2400	400	20	kattee	7.1 m ²

In the Poona district, present-day Pune

		रुकेह		बीघा	Metric
tukka					43,123.49 m ²
1 ²³ / ₂₅	chandy^a				225,064.32 m ²
4 ⁴ / ₅	2½	rooka			90,025.73 m ²
19 ¹ / ₅	10	4	mun		22,506.43 m ²
48	25	10	2½	bigha or bheega	9002.57 m ²

^aVaried between 20 and 35 bigha

Other reported measures:

1 **bigha** or **bheega** (at Sasette Island) = 3283.4 m².

Units of Dry Capacity

In Chiplun (two reported systems)

				Metric	Metric
phura or mun				54.496 L	52.869 L
4	ruká			13.624 L	13.216 L
16	4	páyali or pylee^a		3.406 L	3.304 L
64	16	4	seer	851.5 mL	826.1 mL

^aThe Maratha Government acknowledged a páyali of 3½ seer

In Goregaon, Kareputun, Nagotna, and Nijampur

		Metric	Metric	Metric	Metric
adolee		1.504 L	1.735 L	1.586 L	1.689 L
2	seer	751.9 mL	867.8 mL	793.2 mL	844.4 mL

In Mhar Kusba, Oonderee, Rajapur, Rewudunda, and Sanksee

			Metric	Metric	Metric	Metric	Metric
phura or mun			68.935 L	59.203 L	50.570 L	60.730 L	68.935 L
64	seer		1.077 L	925.0 mL	790.1 mL	948.9 mL	1.077 L
128	2	mapta	538.6 mL	462.5 mL	395.1 mL	474.4 mL	538.6 mL

In Malwun, Soorwurndroog, and Vengurla

		Metric	Metric	Metric
pylee		2.383 L	3.601 L	2.854 L
4	seer	595.9 mL	900.2 mL	713.6 mL

[COLE2] reported that the **adholee** for grain in Poona city was equal to 36,400 troy grains of water at 75°F (=2.358 68 kg) or 144.4 cu in at 60°F (=2.366 L). All types of flour were sold by weight.

At Poone, present-day Puna

						Metric
candy						1135.680 L
20	mun					56.784 L
240	12	puheele				4.732 L
480	24	2	adholee			2.366 L
960	48	4	2	seer		1.183 L
1920	96	8	4	2	adh seer	591.5 mL

Units of Weight

For mercantile use at Ahmednagar

						Metric
candy						715.300 kg
6 ² / ₃	pullah					107.295 kg
20	3	maund				35.765 kg
800	120	40	seer			894.125 g
12,800	1920	640	16	chittack		55.883 g
64,000	9600	3200	80	5	roupie	11.177 g

Alternative scale at Ahmednagar

		Metric
chittack		59.902 g
5 ¹ / ₄	roupie	11.41 g

For solid goods at Ahmednagar

							Metric
candy							1180.25 kg
8	pullah						141.53 kg
20	2 ¹ / ₂	maund					59.01 kg
240	30	12	pylee				4.918 kg
480	60	24	2	adholee or adowly			2.459 kg
960	120	48	4	2	seer		1.229 kg
3840	480	192	16	8		pao	307.36 g
69,120	8640	3456	288	144	72	18	tank 17.07 g

For mercantile use at Aurungabundar

					Metric
maund					33.716 kg
2 ¹ / ₂	cossah				13.486 kg
40	16	pucca seer			842.91 g
640	256	16	anna		52.68 g
2560	1024	64	4	pice	13.17 g

For cereals in general, for barley and for rough rice at Aurungabundar

				Metric	Metric	Metric
carval				894 kg	640.8 kg	674.4 kg
60	cossah			14.90 kg	10.68 kg	11.24 kg
240	4	twier		3.725 kg	2.67 kg	2.81 kg
960	16	4	putto	931.25 g	667.5 g	702.5 g

For gold and silver at Aurungabundar

तोला	माशा			Metric
tola				11.598 g
12	masha			966.5 mg
72	6	ruttee		161.1 mg
1728	144	24	moon	6.7 mg

For dry commodities at Chanadore

								Metric
candy^a								1359.00 kg
20	maund							67.949 6 kg
320	16	pylee						4.246 8 kg
640	32	2	adholee					2.123 4 kg
1280	64	4	2	seer				1.061 7 kg
5120	256	16	8	4	pao-seer			265.428 g
92,160	4608	288	144	72	18	tank or tang		14.746 g
121,600	6080	380	190	95	23 $\frac{3}{4}$	1 $\frac{23}{72}$	roupie	11.176 g

^aAlso reported as = 1359.05 kg

For mercantile use at Chanadore

			Metric
candy			669.69 kg
20	maund		33.48 kg
800	40	seer	837.11 kg

At Dukhun

								Metric
kundee								679.610 968 kg
6 $\frac{2}{3}$	pullah							101.941 645 kg
20	3	mun						33.980 548 kg
160	24	8	panch seer					4.247 568 kg
800	120	40	5	seer				849.514 g
6400	960	320	40	8	nowtank			106.189 g
12,800	1920	640	80	16	2	sanhee chartank		53.095 g
57,600	8640	2880	360	72	9	4 $\frac{1}{2}$	tank or tollah	11.800 g

Alternative division of the seer at Dukhun

					Metric
seer					849.514 g
2	adh seer				424.757 g
4	2	pao seer			212.238 g
8	4	2	adh pau or nowtank		106.189 g
16	8	4	2	chettank	53.095 g

Upper scale at Jalna

					Metric
pullah					109.061 kg
3	maund pucka				36.354 kg
10	3½	maund cutcha			10.906 kg
120	40	12	seer		908.840 g
1920	640	192	16	chittack	56.802 g

Lower scale at Jalna

	माशा			Metric
chittack^a				56.802 g
57½	masha			996 mg
228⅞	4	wall		249 mg
456¼	8	2	ruttee	124.5 mg

^aAlso used for grains, ghee, tobacco, liquids and all other items

For solid goods at Jamkhed

							Metric
candy							1339.21 kg
20	maund						66.961 kg
320	16	pylee					4.185 kg
640	32	2	adoulie or adholee				2.093 kg
1280	64	4	2	seer			1.046 kg
5120	256	16	8	4	pao		261.564 g
92,160	4608	288	144	72	18	tank	14.531 g

^aFor solid goods. 1 **seer** for general use = 894.130 g

For general use at Jamkhed

			Metric
candy			715.30 kg
20	maund		35.765 kg
800	40	seer	894.125 g

At Poona, present-day Pune

								Metric
candy								858 kg
8	pullah							107.25 kg
20	2½	maund						42.9 kg
96	12	4⅓	dhurra					8.938 kg
240	30	12	2½	pylee				3.575 kg
480	60	24	5	2	adoulie or adholee			1.788 kg
960	120	48	10	4	2	chathwa		893.75 g
69,120	8640	3456	720	288	144	72	tank	12.413 g

For general use at Palloda

		Metric
maund		35.299 kg
40	seer	882.470 g

For cereals at Palloda

							Metric
candy							1480.87 kg
20	maund						74.043 kg
320	16	pylee					4.628 kg
640	32	2	adholee				2.314 kg
1280	64	4	2	seer			1.156 93 kg
5120	256	16	8	4	pao-seer		289.232 g
92,160	4608	288	144	72	18	tang	16.068 g

For gold and silver at Ahmednagar

	तोला	माशा			Metric
seer					292.65 g
24	tola				12.194 g
288	12	masha			1.016 g
1152	48	4	vall or wall		254 mg
2304	96	8	2	gonje or goonje	127 mg

For gold at Dukhun

				Metric
toolah				11.907 g
12	massah			992 mg
48	4	waal^a		248 mg
96	8	2	goonj^b	124 mg

^aSeed of *Caesalpinia sappan* (sappanwood)

^bSeed from *Abrus precatorium*

For fine use at Pune

तोला	माशा				Metric
tola					12.413 g
12	masha				1.034 g
48	4	vall or wall			258.61 mg
96	8	2	goonje		129.30 mg
192	16	4	2	what	64.65 mg

Some measures reported at Dukhun, based on [COLE2]:

1 **adhole** (at Punderpoor) = 200 ankoosee rupees
weight of johr guhoon (wheat) = 2.235 kg;

1 **adhole** (at Kothool) = 200 ankoosee rupees
weight of bajree (*Panicum spicatum*) = 2.235 kg;

1 **adhole** (at Mohol) = 160 akoosee rupees
weight of joarree (*Sorghum bicolor*; durra) = 1.788 kg;

1 **adhole** (at Taimbournee) = 131 akoosee rupees
weight of joarre (*Sorghum bicolor*; durra) = 1.464 kg.

Other reported measures:

1 **maund** (for mercantile use at Chanadore) = 40 seer = 33.485 kg;

1 **seer** (for gold and silver at Palloda) = 894.130 g;

1 **seer** (for mercantile use at Chanadore) = 837.111 g;

1 **seer** (for gold and silver at Chanadore) = 292.650 g;

1 **pollam** (at Arnee) = 34.258 g;

1 **tola** (for cereals at Jalna) = 11.968 g;

1 **roupie** (at Jalna) = 11.230 g;

1 **pice** (at Jalna) = 10.819 g.

25.42 Malabar

Units of Dry Capacity

					Metric
chepun parah					30.60 L
10	thoone				3.060 L
15	1½	edungally or dongalec ^a			2.040 L
60	6	4	cheroonally		510.05 mL
120	12	8	2	ooree	255.02 mL

^aIn Chowghaut, Nedinganad, and Wynaad called **Kolgum** or **Narayun**

Units of Liquid Capacity

1 **chotana** = an uncertain and variable measure, varying in different places.

25.43 Manipur

Main sources: [DAS1] and <http://dolr.nic.in> (internet-site for The Indian Department for Land Resources)

Units of Length

Some reported measures (Information from the article published in “Naga Hills and Manipur”, *Assam Gazetteers*, vol. 9, by Basil Copleston Allen, as reprinted in 2009 in *Gazetteer of Bengal and North-East India*, published by Mittal Publications, Delhi):

1 **sana lamjel** (established in 33 CE, by Nongda Lairen Pakhangpa) = the distance from the floor to the tips of the fingers of the ruler’s raised hand while standing, plus 4 fingerwidths.

1 **sana lamjel** (modified during the reign of King Khagemba (1597–1652)) = the distance between the fingertips of the king’s outstretched arms, plus 4 fingerwidths.

Units of Area

For surveying before 1891

						Metric
pari ^a						~12,000 m ²
2	lourak					~6000 m ²
4	2	sangam				~3000 m ²
8	4	2	loukhai			~1500 m ²
16	8	4	2	loushal		~750 m ²
32	16	8	4	2	tong	~375 m ²

^a1 **pari** = a land area equal to 50 sana lamjel × 60 sana lamjel

During British rule, after 1891, the Mouzadari Nall survey and Mouzadari Chain survey were introduced in analogy with the Bengal and Assam systems, using the Bigha, Katha and Lessa as units of area.

25.44 Mizoram

Units of Dry Capacity

The measures used for rice were relative. A number of buckets, varying in size, shape and length, was used for dry commodities, e.g., **fawng** (u-shaped), **dawrawn** (long), **tam em** (big) and **empai** (medium size bucket). Larger quantities were usually measured in numbers of load. [KABR, p. 17]

25.45 Nawanager

This state was founded in 1535 by Jam Raval, and became a tributary to the Gaekwar family and, during the nineteenth century, to the British Empire as well. In 1948, the area was merged into Saurashtra.

Currency

c.1570–1956: 1 kori = 8 dodka = 12 dthinglo = 16 trambiyo

I have not found any data directly related to this area.

25.46 Orissa

Orissa was once a separate kingdom, whose dynasty was established around 1532, after which the Orissa, after a half century of war, became a province of the Mogul Empire in 1578. It became a British protectorate in 1765. The Bihar and Orissa province was formed in 1912 as a new province of India, covering the three divisions of Bihar, Chota Nagpur and Orissa. In 1950, Orissa became a constituent state in the Union of India.

Main source: [WILS]

Units of Length

1 **chākhaṇḍ** [Oriya: ଚାଖଣ୍ଡ] = in concept, the distance between the tip of the outstretched little finger and the thumb = about 230 mm.

Units of Area

1 **bakra** (in Cuttack) = probably the land area of a village;

1 **bīghā** (in Cuttack) = 1 English statute acre = 4,840 sq yd = 4046.77 m².

Units of Dry Capacity

For cereals at Balasore

				Metric
bhurrun				
4	pottee			
80	20	goon ^a		4.287–
400–960	100–240	5–12	seer	857.475 g

^aThe goon varied in different pergunahs

Units of Liquid Capacity

At Balasore

				Metric
maund				34.299 kg
40	seer			857.475 g
640	16	chittack		53.592 g
2560	64	4	pice	13.398 g

Units of Weight

For general use at Balasore

		Metric
maund		34.299 kg
40	seer	857.475 g

For gold and silver at Balasore

	तोला	माशा			Metric
seer					857.475 g
72	tola				11.909 g
864	12	masha			992.45 mg
6912	96	8	ruttee		120.56 mg
27,648	384	32	4	dhan	31.014 mg

25.47 Porbandar

The state was ruled by the Jethwa Rajputs since the tenth century. In 1807, Porbandar acceded to British control, and in 1948, the area became part of Saurashtra.

Currency

–1956: 1 kori = 8 dodka = 12 dhanglo = 16 trambiyo

I have not found any data directly related to this area.

25.48 Punjab

In 1849, the Sikhs were defeated by the British, and Punjab became part of British India. In 1947, the province was split between India and Pakistan.

Units of Area

British Imperial-linked system

	घुमाओ	बीघा	कनाल	माला	वर्ग करम	Metric
ghamaon (=6480 sq yd)						5418.105 m ²
2	swing (3240 sq yd)					2709.052 m ²
4	2	bigha (=1620 sq yd)				1354.526 m ²
16	8	4	kanal (=405 sq yd)			338.631 m ²
320	160	80	20	marla (=20¼ sq yd)		16.932 m ²
5760	2880	1440	360	18	karam ² (= 1⅞ sq yd)	94.064 dm ²

25.49 Rajasthan

During the years 1817–1818, all the local rulers of the area became states under British administration. Rajasthan was formed in 1949, when all these states merged into the Dominion of India.

Units of Area

1 **bigha** = 1618.7 m².

Units of Weight

At Doongurpoor, present-day Dungarpur

					Metric
maunée					272.904 kg
12	maund				22.742 kg
48	4	dhurra			5.685 kg
480	40	10	seer		568.550 g
24,960	2080	520	52	roupie	10.933 6 g

At Kotah, present-day Kota

					तोला			Metric
maunée								163.208 kg
12	maund							13.601 kg
96	8	dhurra						1.700 kg
480	40	5	seer					340.016 g
9120	760	95	19	pice				17.896 g
13,680	1140	142½	28½	1½	tola			11.930 g
14,400	1200	150	30	1⅞ ₁₉	1⅜ ₅₇	roupie		11.334 g
164,160	13,680	1710	342	18	12	11⅞	mash	994 mg

25.50 **Sikkim**

Some other reported measures:

The Kingdom of Sikkim was founded in 1642, when Phuntsog Namgyal (1604–1670) was proclaimed Chogyal. In 1861, Sikkim became a protectorate of British India.

I have not found any data directly related to this area.

1 **balla** or **bulḷa** (in Coimbatore) = about 15,500 m².

25.51 **Tamil Nadu**

Main source: [WILS]

Units of Dry Capacity

In southern Arcot

garce				
33⅓	callum			
400	12	marcul		
800	24	2	vellom	
3200	96	8	4	nazhe

Units of Length

British Imperial-linked system

					Metric
mile					1609.344 m
8	furlong				201.168 m
80	10	chain			20.116 8 m
1760	220	22	kejam		914.4 mm
5280	660	66	3	foot	304.8 mm

Units of Area

Traditional system

				Metric
veḷi				26,061.52 m ²
7	kāni			3,723.07 m ²
28	4	mā		930.77 m ²
2800	400	100	kuzhi	9.308 m ²

British Imperial-linked system

							Metric
township							9339.997 ha
36	square mile						259.444 ha
23,040	640	acre					4,053.818 m ²
418,909⅔ ₁₁	11,636⅔ ₁₁	18⅔ ₁₁	ground				222.960 m ²
921,600	25,600	40	2⅓	dismil			101.345 m ²
2,304,000	64,000	100	5½	2½	cent		40.538 m ²
1,005,381,818⅔ ₁₁	27,927,272⅔ ₁₁	43,636⅔ ₁₁	2400	1 090 ¹⁰ / ₁₁	436 ⁴ / ₁₁	square foot	9.290 dm ²

In northern Arcot

						Metric
candy						245.28 L
4	parah or toom					61.32 L
20	5	marcal				12.264 L
40	10	2	bullah			6.132 L
160	40	8	4	puddy		1.533 L
1280	320	64	32	8	pudacoo	191.625 mL

In Coimbatore

								Metric
pudy								
2 $\frac{2}{5}$	cundagum							
3	1 $\frac{1}{4}$	solga						
5 $\frac{1}{3}$	2 $\frac{2}{9}$	1 $\frac{1}{9}$	cullum					
6	2 $\frac{1}{2}$	2	1 $\frac{1}{8}$	moda				
64	26 $\frac{2}{3}$	21 $\frac{1}{3}$	12	10 $\frac{2}{3}$	murcal			
96	40	32	18	16	1 $\frac{1}{2}$	bullah		
384	160	128	72	64	6	4	nantoo purree	

In Madurai, Thanjavur, Tiruchirappalli, and Tirunelveli

									Metric
grace or gurisei									14,691 L
100	callum								146.908 L
300	3	tumi							48.969 L
600	6	2	paddacú						24.485 L
1200	12	4	2	murcal					12.242 L
9600	96	32	16	8	nazhe				1.530 L
19,200	192	64	32	16	2	uri			765.14 mL
38,400	384	128	64	32	4	2	oozhaccú		382.57 mL
76,800	768	256	128	64	8	4	2	azhaccú	191.29 mL
384,000	3840	1280	640	320	40	20	10	5	shuvadú 38.57 mL

In Salem

poothee				
2 $\frac{2}{5}$	cundagum or candy			
6	2 $\frac{1}{2}$	moora or modah		
96	40	16	bullah	
384	160	64	4	pudacoo

Units of Liquid Capacity

For oil

அட்டம்		Metric
ádam		30.7 L
20	puddee	1.535 L

Other reported measures:

1 **mercar** (for rice in Nagapattinam) = about 2.6 L.

Units of Weight

At Arcot

		Metric
seer		822.210 g
24	pollam	34.258 g

At Colatchey, present-day Kolachal

							Metric
maund							10.234 kg
1 $\frac{1}{5}$	(small) maund						8.528 kg
1 $\frac{1}{2}$	1 $\frac{1}{4}$	toolam					6.822 6 kg
30	25	20	rottolo				341.130 g
150	125	100	5	pollam			68.226 g
2025	1687 $\frac{1}{2}$	135	67 $\frac{1}{2}$	13 $\frac{1}{2}$	kallanje		5.054 g
39,975	33,312 $\frac{1}{2}$	2665	1332 $\frac{1}{2}$	266 $\frac{1}{2}$	19 $\frac{20}{27}$	munjandie	256 mg

At Dindigul

			Metric
maund			11.338 kg
1 $\frac{141}{600}$	toolam		8.844 kg
128 $\frac{1}{5}$	100	pollam	88.441 g

At Palamcottah, present-day Palayamkottai

							Metric
paddy							2239 kg
197 $\frac{23}{50}$	maund						11.339 kg
		toolam					8.617 kg
			toolam				5.669 kg
				seer			821.400 g
7 593 $\frac{1}{5}$					seer		2.770 g
39,493 $\frac{1}{5}$	200	152	100			pollam	56.693 g
425,261 $\frac{1}{5}$				156	56		kullanjee 4.947 g

At Trichinopoly, present-day Tiruchirappalli

						Metric
toolam						6.916 kg
7 $\frac{1}{5}$	seer ^a					960.498 g
8	1 $\frac{1}{9}$	seer ^b				864.448 g
194 $\frac{1}{5}$	27	24 $\frac{3}{10}$	pollam ^a			35.574 g
216	30	27	1 $\frac{1}{9}$	pollam ^b		32.017 g
1944	270	243	10	9	pagode	3.557 4 g

^aFor wholesale

^bFor retail

At Negapatam

		Metric
bahār		211.140 kg
20	mann	10.557 kg

Some other reported measures:

- 1 **vis** (at Trichinopoly) = 1.360 kg;
- 1 **seer** (for metals at Trichinopoly) = 270.030 g;
- 1 **maund** (at Tharangambadi) = 33.953 kg;
- 1 **pollam** (at Vellore and Wallagahbad) = 34.258 g;
- 1 **mañjāḍi** (for diamonds in Coimbatore) = 570.2 mg;
- 1 **mañjāḍi** (for diamonds in Thanjavur) = 349.9 mg;
- 1 **mañjāḍi** (for silver in Madras, present-day Chennai) = 291.6 mg.

Travancore-Cochin, and in 1956, the Malabar district joined to form the Indian state of Kerala.

Main sources: [DOUR], [KELL] and [NAGA]

Currency

- 1949–1951: 1 Indian rupee = 16 annas = 192 pies
- 1888–1949: 1 Travancore rupee = 28 chuckrams = 448 cash
- 1798–1888: 1 Travancore pagoda = 7½ rupees = 26¼ anantarayas = 52½ fanams = 210 chuckrams = 3360 kasus or cash

25.52 Kingdom of Travancore (sixteenth century–1947)

In 1949, Travancore and the princely state of Cochin merged to form the Indian state of

Units of Length

						Metric
yojana						23,624.03 m
4	crosam					5906.01 m
10	2½	nazhiga				2362.40 m
8000	2000	800	thendoo			2.953 m
32,000	8000	3200	4	kole		738.25 mm
768,000	192,000	76,800	96	24	angulam, borrel, or Malabar inch	30.76 mm

Units of Volume

For timber, based on [KELL]:

- 1 **candy** (for round and square timber) = 24 24 24
borrels = 13,824 cu borrels = 402.36 dm³;
1 **tooda** (for plank taldoms etc.) = 24 24 2
borrels = 1152 cu borrels = 33.53 dm².

Units of Dry Capacity

For salt

				तोला
garce				
	coomb			
120		maund		
	160		parah	
384,000	168,000	3200	1050	tola or rupee

Units of Liquid Capacity

For oil, based on [DOUR]

			Metric
candy			37.26 L
30	choradany		1.242 L
337½	11¼	dungally	110.2 mL

Other reported measures:

- 1 **bigha** (in Banaras, present-day Varanasi, by
Reg. II in 1795) = 3136 sq yd = 2622.0 m²;
1 **bigha** (at Farrukhabad) = 2756¼ sq
yd = 2304.5 m²;
1 **bigha** (at Moradabad) = 18 18 guttas = 2304 sq
yd = 1926.4 m²;
1 (**kuchcha**) **beeg,ha** (in Upper Doab, present-
day Meerut) = 831⅔ sq yd (an average side of a
beeg,ha was deduced from the paces of
148 Zumindars, who were accustomed to
practice this kind of mensuration, and was
reported as about 28,834/1000 English
yards) = 695.14 m²;
1 **baṭ** (in Ghazipur) = a small land measure.

Units of Weight

Upper scale in general in northern India

				तोला		
penseri						
1¼	pawwā					
5	4	seer				
80	64	16	chhatak			
400	320	80	5	tola		
1200	960	240	15	3	tānk	
4800	3840	960	60	12	4	māsha

25.53 Uttar Pradesh

Main sources: [CLAR5], [SIMM] and [WILS].

Units of Area

British Imperial-linked system

बीघा	बिस्वा	बिस्वांसी	कचवांसी	Imperial	Metric
bigha				55 × 55 sq yd = 3025 sq yd	2529.28 m ²
20	biswa				126.46 m ²
400	20	biswansi			6.32 m ²
8000	400	20	kwansi		31.6 dm ²

Lower scale in general in northern India, based on 1922: *Nature*, **110**, 324.

तोला	माशा					
tola						
12	masha					
96	8	rattí				
192	16	2	qirāt			
384	32	4	2	jau^a		
768	64	8	4	2	chawal^b	
6144	512	64	32	16	8	khaskha^c

^aBarleycorn

^bGrain of unhusked rice

^cPoppy seed

Old Nawibi scale in Bharaich district, as reported in 1873, based on [CLAR5]

		तोला	माशा			Metric
pau						287.04 g
4	chittack					71.76 g
20	5	tola				14.35 g
240	60	12	masha			1.196 g
1920	480	96	8	rattí		149.5 mg
7680	1920	384	32	4	jau^a	37.4 mg

^aBarleycorn

At Allahabad

			Metric
maund			44.789 kg
40	seer		1.119 725 kg
640	16	chittack	69.983 g

At Coolpahar

			Metric
maund			56.027 kg
40	seer		1.400 672 kg
640	16	chittack	87.542 g

At Furruckabad, present-day Farrukhabad

				Metric
seer^a				919.140 g
2%	seer^b			156.926 g
7 $\frac{1}{11}$	1 $\frac{1}{11}$	seer^c		123.299 g
82	14	11	roupie	11.209 g

^aFor groceries

^bFor retail sale

^cFor wholesale

At Ghrowle

			Metric
maund			35.203 kg
40	seer		880.070 g
640	16	chittack	55.004 g

Two reported scales at Mirzapur

			Metric	Metric
maund			39.114 kg	39.117 8 kg
40	seer		977.840 g	977.945 g
640	16	chittack	61.115 g	61.121 g

For wholesale and for retail at Mowdhaw

			Metric	Metric
seer			991.250 g	881.430 g
16	chittack		61.953 g	55.089 g
90 $\frac{2}{3}$	5 $\frac{2}{3}$	roupie	10.933 g	9.722 g

For cereals, cotton, ghee, sugar and metals at Calpee, present-day Kalpi

			Metric	Metric	Metric	Metric
maund			44.576 8 kg	43.939 2 kg	43.302 kg	38.481 2 kg
40	seer		1.114 42 kg	1.098 48 kg	1.082 55 kg	962.030 g
640	16	chittack	69.651 g	68.655 g	67.659 g	60.127 g

Local scale in Oudh, present-day Awadh, during the mid-nineteenth century^a

	पंसेरी			तोला		Metric
maund						18.195 kg
8	panseri					2.274 kg
40	5	seer				454.89 g
260	32½	6½	chhalák or ganda ^b			69.98 g
1595	–	–	–	tola		11.41 g
15,697	–	–	–	–	másha	1.16 g

^a*Gazetteer of the Province of Oudh*. Allahabad: North-Western Provinces and Oudh Government Press, 1877

^bReported as 6 Farrukhabad rupee of 180 grains = 69.98 g

At Varanasi

		तोला	Metric
maund			48.988 088 kg
40	seer		1.224 700 kg
4200	105	tola	11.664 g

At Varanasi

		तोला	Metric
maund			48.054 901 kg
40	seer		1.201 372 kg
4120	103	tola	11.664 g

Local scales reported in 1877³:

- In Jharka: 1 local seer = 408.2 g (as 5 local seers = 2 Government seers) and 1 local maund = 16 Government seers = 16.33 kg;
- In Nawabganj: 1 local seer = 433.74 g (as 5 local sers = 2½ Government sers) and 1 local maund = 17 Government seers = 17.35 kg;
- In Dewa, Rámnagar, TikaitGanj, and Zaidpur: 1 local seer = 459.26 g (as 5 local seers = 2¼ Government seers) and 1 local maund = 18 Government seers = 18.37 kg;
- In Fatehpur: 1 local seer = 510.29 g (as 5 local seers = 2½ Government seers) and 1 local maund = 20 Government seers = 20.41 kg.

Conversions reported in 1877⁴:

- 1 **old Government seer** = 80 Government tolas = 32⅔ ounces = 929.9 g;
- 1 **new Government seer** = 87¾ Government tolas = 36 ounces = 1.020 kg;
- 1 **old Nawabi seer** = 91⅔ Government tolas = 37½ ounces = 1.063 kg.

Some other measures reported during the late nineteenth century:

- 1 **seer** (at Lucknow) = 1.117 53 kg;
- 1 **seer** (for groceries at Ghouhown) = 1.042 18 kg;
- 1 **seer** (at Esslampore) = 1.018 72 kg or 928.340 g;
- 1 **seer** (for retail sale at Ghouhown) = 963.780 g;
- 1 **seer** (at Hummerpore) = 920.820 g;
- 1 **chittack** (at Panwarree) = 60.459 g;
- 1 **chittack** (for grain at Aummoodh) = 57.579 g;
- 1 **chittack** (for retail sales at Mowdhaw) = 55.089 g;
- 1 **chittack** (at Ghrowle) = 55.004 g;
- 1 **chittack** (for cotton at Aummoodh) = 42.520 g;
- 1 **tola** (for gold and silver at Varanasi) = 13.931 8 g.

25.54 Uttarakhand

Main sources: [BATT], [WILS]

Units of Length

- 1 **baká** (for cloth in Kamaon) = 2 breadths.

³ *Gazetteer of the Province of Oudh*. Allahabad: North-Western Provinces and Oudh Government Press, 1877.

⁴ *Gazetteer of the Province of Oudh*. Allahabad: North-Western Provinces and Oudh Government Press, 1877.

Units of Area

In Kamaon, based on [WILS]

						Bísí ^a	Metric
jhúla						12, 9, 6 or 3	48,160–12,040 m ²
–	bísa					4	16,053.6 m ²
–	1½	bhara or alí				2½	10,033.5 m ²
–	3	2½	anṣ^b or ríni			1	4013.4 m ²
–	4	3⅓	1½	masa		¾	3010.05 m ²
–	6	5	2	1½	taka	½	2006.70 m ²

^aAs much land as would be sown with a specific number of bísí of seed (=40 seers of seed/bísí). The number of nálís of corn needed for sowing a bisi has also been reported as the number of **bilkás**

^bVaried according to the quality of soil. The regular measure was an area of land requiring about 20 nálís of seed, but the grain was sown much wider in poor lands near the summit than it was in rich lands at the base of the mountains

According to [WILS, p. 365 and 572], 20 nálís of seed was the amount of seed that would fit in a sheep's saddle-bag. George William Traill, the Commissioner of Kumaon, reported on the Bhotia Mahals of Kumaon (in [BATT, pp. 34–36]) that 4 nálís of seed was the capacity of a sheep's saddle-bag. He called this measure a **karbich**. He also mentioned a large karbich, **suýattor**, that was equal to 20 nálís.

Another way of expressing a bísí of land was as the quantity of land that can be ploughed in 20 days by two yoke of bullocks.

At Puraniya, based on [WILS, pp. 309–310]

bíghá		
20	hatha or lattá	
400	20	square lar or square lur

It varied by location. One lar or lur was reported as 4 ½, 6, or 6 ½ cubits.

Units of Dry Capacity

1 **bilká** = a sheaf of corn.

25.55 West Bengal

Main sources: [WILS]

Units of Length

1 **haut** (at Cossimbazar) = 485.775 mm.

Units of Area

	बिघ	कट्ठा	धूल			Metric
chaoor						8027.4 m ²
6	bigha					1337.9 m ²
60	10	cottah				133.8 m ²
120	20	2	dhul^a			66.9 m ²
2400	400	40	20	poluh		3.34 m ²
48,000	8000	800	400	20	cathee²	16.7 dm ²

^aAlso called **kátá** or **pand**

Other reported measures:

1 **bigha** (in the Jungle Mahals) = 80 80 haths = about 1340 m².

Units of Liquid Capacity

At Cossimbazar

		Metric
seer		928.45 g
80	sicca	11.60 g

Units of Weight

For grain and rice

पंसेरी		Metric
panseri, pasári, or pasuri^a		4.65 kg
5	seer	929.9 g

^aVaried from one place to another, from 5 seers to 8 seers

At Cossimbazar; at Houghly and Malda (generally and as used at bazaars)

		Metric	Metric	Metric	Metric
maund		37.133 6 kg	38.182 8 kg	46.488 kg	37.294 kg
40	seer^a	928.340 g	954.570 g	1.162 21 kg	932.360 g

^aIt was also reported as 881.430 g, 904.430 g and 960.220 g

Other reported measures at Cossimbazar:

1 **seer** = 82 sicca = 951.66 g;

1 **seer** = 80 sicca = 928.45 g;

1 **seer** = 78 sicca = 905.23 g;

1 **seer** = 76 sicca = 882.02 g.

In Barasat

Bis					
20	arhi				
160	8	kati			
320	16	2	don		
640	32	4	2	pali	
1600	80	10	5	2½	seer

In Diamond Harbour

kahan					
4	sali				
16	4	pan			
80	20	5	katha		
320	80	20	4	pali	
800	200	50	10	2½	seer

In the south of Diamond Harbour

					तोला
kahan					
1⅓	bisi				
16	10	kurih			
320	200	20	pali		
664	415	41½	2¾ ₄₀	seer	
53,120	33,200	3,320	166	80	tola

Other reported measures:

1 **balla** = 2 ratis = about 3.9 g.

26 Republic of Indian Stream

See also *United States of America*.

This small, unrecognized republic in present-day New Hampshire existed from mid-1832 until 1835.

27 Indonesia [Formerly: Netherlands East Indies; Dutch East Indies]

See also *Sumatra*.

The area became the Netherlands East Indies in 1610. In 1619, the settlement of Batavia (present-day Jakarta) was established and the area was renamed the Dutch East Indies. Large areas of the East Indies remained outside Dutch control until the early twentieth century. British forces took over most of the outer islands from 1799 to 1802, and took over all areas, including Java, from 1811 to 1816. The Japanese occupied the area from 1942 to 1945. Indonesia gained its independence in 1949.

The Dutch system of weights and measures was generally used in foreign trade, while the Chinese denominations of weights were used in common business. Some English units and scales

were established during the early nineteenth century. The metric system was adopted in 1923 and as been compulsory since 1938.

Main sources: [ENCY], [MART3], [NELK], [POSE], [SCHW], [VISS], and [WICK]

27.1 Currency

1950–:	1 Indonesian rupiah = 100 sen
1854–1950:	1 Netherlands Indies guilder = 100 cents
1817–1854:	1 Netherlands Indies guilder = 30 stuiver = 120 duit
1610–1817:	1 Dutch guilder = 30 stuiver = 120 duit

At Bantam

1 bahar = 10 utas = 100 catties = 1000 laxsans = 10,000 peccoos

At Batavia. Present-Day Jakarta

1 rupee = 4 shillings = 12 dubbeltjees = 15 cash = 30 stivers = 120 doits

1 sooka = 2 satalies = 6 cash = 12 stivers

1 patack = 6 mace = 24 cash (principal coins)

1 tale = 10 mace = 40 cash = 400 condorines (denomination used in the Bazaar)

27.2 Units of Quantity

1 **corge** or **cooree** = 20 or 24;

1 **gundah** = 4;

1 **kunca** = a bundle of paddy or a bale of straw.

27.3 Units of Length

1 **geographical mile** = 7407.407 m;

1 **cengal** = 3.66 m;

1 **kabung** (for woven textiles) = 1.88 m;

1 **yard** (Imperial scale) = 914.392 mm;

1 **élo** (Brabant scale) = 694.38 mm;

1 **élo** (Amsterdam scale) = 687.81 mm;

1 **bahar** = the distance from the toes to the upward stretched finger.

Traditional system

			Metric
depa			~1.70 m
4	hasta		~425 mm
8	2	kilan	~212.5 mm

Rijnlandse scale during the nineteenth century and twentieth centuries

			Metric	Metric
paal or Java paal			1506.943 2 m	1508 m
400	Rijnlandse roede or tjengkal		3.767 358 m	3.770 m
4800	12	voet	313.946 5 mm	314.17 mm

Persian scale

			Metric
persangga			~5633 m
~1¾	keruh		~3219 m
~6760	~3863	gaz	833.3 mm

Metric scale after 1923

								Metric
mil								10,000 m
10	kilometer							1000 m
100	10	hektometer						100 m
1000	100	10	dekameter					10 m
10,000	1000	100	10	meter				1 m
100,000	10,000	1000	100	10	desimeter			100 mm
1,000,000	100,000	10,000	1000	100	10	sentimeter		10 mm
10,000,000	1,000,000	100,000	10,000	1000	100	10	milimeter	1 mm

27.4 Units of Area

Rijnlandse scale

						Metric
paal²						2,270,877.808 m ²
80	panchar or jonke					28,385.972 6 m ²
160	2	djung				14,192.986 3 m ²
320	4	2	bau, bahoe, bahu, or bouw			7,096.493 1 m ²
160,000	2000	1000	500	Rijnlandse roede² or tombak persegi		14.192 986 m ²
23,040,000	288,000	144,000	72,000	144	voet²	9.856 24 dm ²

Other reported measures:

1 **lieue²** (geographic) = 5506.32 m²;
 1 **ru** = 14.49 m².

During the late twentieth century

			Metric
djung			14,191 m ²
2	bau		7095.5 m ²
1000	500	tombak persegi	14.191 m ²

27.5 Units of Volume

1 **tenah** (at Bali) = the amount of land one tenah of water will irrigate, usually about 3000–4500 m².

The water irrigation system for paddy fields on Bali Island is called a subak. The number of

tenah was fixed for each subak, by the concrete pattern of successive water divisions whose form is determined by the subak as a corporate group, but differ between the subaks.

1 **pecatu** = a rice field;

1 **toembak** = 6.684 m³;

1 **kojang** = 1.976 362 m³.

27.6 Units of Dry Capacity

Measures reported in Bali and Java during the early eleventh century:

1 **kulak** (for fennel and peppers) = the amount weighing 1 kati;

1 **kulak** (for coriander, beans, jamuju, salt cakes, and wungkudu) = the amount weighing 1 sukat.

Measures reported during the fifteenth century

			Metric
dou			10.737 L
10	Sheng		1.0737 L
100	10	ge or ko	107.37 mL

27.7 Units of Liquid Capacity

1 **kulak** (for oil) = 3.709 L;

1 **batok** = 1.07 L;

1 **bambu** = ~500 mL.

For rice and salt (Dutch scale) in the late nineteenth and mid-twentieth centuries, according to [NELK] (value for gantang)

					Metric	Metric	Metric
koyan					1,961.032 3 L	2,011.267 9 L	–
30	pekul				65.367 74 L	67.042 3 L	–
78	2 $\frac{3}{5}$	takar			25.141 44 L	25.785 5 L	–
234	7 $\frac{1}{5}$	3	gantang		8.380 48 L	8.595 2 L	8.576 6 L
1872	62 $\frac{3}{5}$	24	8	batok	1.047 56 L	1.074 4 L	–

For rice and salt at Penang

			Metric
last			1024.25 L
46	measure		22.266 L
230	5	gantang	4.453 L

For various commodities, based on [VISS]

			Metric
proco^a			31.68 L
6	Kula		5.28 L
96	16	cupa^b	0.33 L

^aA basket woven of nips leaves

^bA milk tin that holds 1/3 L

For cereals at Bali

					Metric
kulak					3.792 L
4	cupak				948 mL
8	2	léng			474 mL
16	4	2	pauh		237 mL
32	8	4	2	cutuk^a	118.5 mL

^aA coconut shellful

1 **tenah** (at Bali) = the amount of rice seedlings needed to plant an area of land of one tenah;

1 **tenah** (at Bali) = the amount of unthreshed paddy harvested from an area of land of one tenah.

For oil

						Metric
takar						25.770 3 L
1 $\frac{7}{10}$	Kit					15.159 L
7	–	kulak				3.713 9 L
16 $\frac{3}{5}$	–	–	kan			1.576 5 L
170	100	24 $\frac{1}{2}$	10%	mutsje		96.154 mL
340	200	49	20%	2	pintje	75.795 mL

For arrak

		Metric
legger^a		550.572 L
388	kan	1.419 L

^aAlso reported as 578.88 L during the early twentieth century

1 **tenah** (at Bali) = the amount of water that will pass through a small opening, which is cut into a wooden water divider called a tembuku.

27.8 Units of Weight

In Java and Bali from the ninth century

						Metric
kāṭi						617.616 g
16	suwarna					38.601 g
256	16	māṣa				2.412 g
512	32	2	atak			1.206 g
1024	64	4	2	kupang		603 mg
102,400?	6400?	400?	200?	100?	sāga	6 mg

For rice during the eighteenth century

									Metric
coyang or koyan									3425.28 kg
5	kunca								685.06 kg
50	10	naléh or nalih							68.51 kg
800	160	16	gantang						4.282 kg
960	192	19½	1½	kulak					3.568 kg
3840	768	76½	4½	4	cupak				892 g
7680	1536	153¾	9¾	8	2	léng			446 g
15,360	3072	307¾	19½	16	4	2	pauh		223 g
30,720	6144	614¾	38¾	32	8	4	2	cutuk	111.5 g

Dutch upper scale for foreign trade in Batavia, present-day Jakarta, during the nineteenth century

								Dutch troy pounds	Metric
coyang or koyan^a								3375	1661.066 055 kg
5½	timbang							625	307.604 825 kg
6	1½	(large) bahar^b						562½	276.844 342 kg
9	1¾	1½	(small) bahar^b					375	184.562 895 kg
13½	2½	2¼	1½	amat				250	123.041 930 kg
27	5	4½	3	2	pecul^c			125	61.520 965 kg
54	10	9	6	4	2	sack		62½	30.760 482 kg
2700	500	450	300	200	100	50	catty	1¼	615.209 6 g

^aThe koyan varied by location. At Semarang = 28 pekuls = 3500 Dutch troy pound = 1722.587 020 kg, and at Surabaya = 30 pekuls = 3750 Dutch troy pound = 1845.628 95 kg

^bThe bahar varied according to the item weighed: for agar-agar satu = 12 pekuls, for emas satu = 10 pekuls, for kayu cendana satu = 6 pekuls and for teripang satu = 3 pekuls. The large bahar was used for cloves, pepper, ginger and nutmeg, and the small bahar for ivory, silk, quicksilver and vermillion

^cAlso spelled **picul**, **pikol**, or **pikul**

Dutch lower scale for foreign trade in Batavia, present-day Jakarta, during the nineteenth century

				Dutch troy pounds	Metric
gantang^a				12½	6.152 096 kg
1 ^{1/29}	kulak				4.460 270 kg
10	7¼	catty		1¼	615.209 6 g
160	116	16	tale or thail		38.450 6 g

^aFor coffee

At Banjarmasin during the late nineteenth century

		Metric
last		1319.0 kg
240	gantang^a	6.048 kg

^aFor pepper = 16 cattis = 9.843 354 kg

At Ceribon during the late nineteenth century, based on [MART3]

			Metric
coyang			1845.628 950 kg
1½	tiaiang		1230.419 300 kg
30	20	pekul	61.520 965 kg

In Batavia, present-day Jakarta, during the twentieth century

									Metric
coyang or koyan^a									1667.555 kg
27	pekul								61.761 kg
2700	100	catty							617.613 g
3375	125	1¼	pound						494.080 g
43,200	1600	16	12½	thail					38.601 g
54,000	2000	20	16	1¼	ons				30.881 g
108,000	4000	40	32	2½	2	lood			15.440 g
432,000	16,000	160	128	10	8	4	tja or tji		3.860 g
4,320,000	160,000	1600	1280	100	80	40	10	mata or hoon	386.0 mg

^aFor seed and grain, it varied between 27 and 40 pekuls

On Java and Madura during the nineteenth century

						Metric
coyang or koyan						1845.628 95 kg
6	timbang					307.604 825 kg
30	5	pekul				61.520 965 kg
60	10	2	sack or sacco			30.760 482 kg
500	83⅓	16⅔	8⅓	kulak or kulack		3.691 258 kg
3000	500	100	50	6	catty	615.209 6 g

For rice and corn at Bantam, based on [MART3]

						Metric
coyang or koyan						3937.341 76 kg
64	pekul					61.520 965 kg
200	$3\frac{1}{2}$	gantam				19.686 709 kg
1600	25	8	bamboo			2.460 839 kg
$4\ 266\frac{2}{3}$	$66\frac{2}{3}$	$21\frac{1}{3}$	$2\frac{2}{3}$	culac^a		922.814 47 g
6400	100	32	4	$1\frac{1}{2}$	catty	615.209 65 g

^aFor pepper

Dutch scale for rice at Cheribou

				Dutch troy pounds	Metric
coyang or koyan				3750	1845.629 kg
$1\frac{1}{2}$	tiayang			2500	1230.418 kg
30	20	pekul		125	6.152 095 kg
3000	2000	100	catty	$1\frac{1}{4}$	615.209 5 g

For general use in Bantam

			Metric
bahar			179.6 kg
3	pekul		59.9 kg
300	100	Catty	599 g

Dutch scale for pepper in Bantam during the early nineteenth century

		Dutch troy pounds	Metric
bahar		375	184.6 kg
200	goelack	$1\frac{1}{8}$	923 g

For pepper during the late nineteenth century

			Metric
timbang			276.844 kg
5	pekul		55.369 kg
10	2	sack	27.684 kg

For gold and silver in Bali and Java during the late ninth century

						Metric
kāṭi or kā^a						617.616 g
16	suwarna^b					38.601 g
256	16	māṣa				2.412 g
512	32	2	atak or hatak			1.206 g
1024	64	4	2	kupang		603.1 mg
2048	128	8	4	2	sāga^c	301.6 mg

^aIt is presumed here that 1 kāṭi equals 16 suwarna. It was possibly 20 suwarna

^bThis weight was called **dhārāṇa** when used for silver

^cUndetermined equivalence. It is presumed here that 1 sāga equals $\frac{1}{2}$ kupang

For fine use during the fifteenth century

				Metric
jin				596.80 g
16	liang			37.3 g
16,000	1000	qian		37.3 mg
160,000	10,000	10	fen	373 mg

For precious metals in Bali and Java during the sixteenth and early nineteenth century

		Metric	Metric
basa or viss		1.14 kg	1.40 kg
100	di'ngkel	11.4 g	14.0 g

For fine use in Bali and Java during the eighteenth century

		Metric
thil or tahlil		15 g
10 or 12	dram	1.5 g or 1.25 g

For gold, silver, and diamonds at Banjarmasin during the late nineteenth century

				Metric
tehl				39.767 g
16	meh			2.485 4 g
96	6	tiha		414.24 mg
288	18	3	malaburang	138.08 mg

For precious metals and diamonds in Indonesia

					Metric
thail or taël^a					54.090 g
2	reaal or real				27.045 g
8	4	soekoe or suku			6.761 g
16	8	2	tali		3.381 g
48	24	6	3	wang	1.127 g

^aIn Bantam (for fine use as gold and musk) = 68.36 g1 **carat** (for diamonds) = 205 mg.1 **tale** (for civets, bezoar and gold) = 36.2 g

For gold during the eighteenth century

					Metric
bidur					~1.25 kg
2	kati				~625 g
32	16	thail or bungkal			39.062 g
85⅓	42⅔	2⅔	tengkam		14.648 g
512	256	16	6	kupang	2.441 g

1 **kundi** = the weight of a Jequirity (a half-red and half-black pea (*Abrus precatorius*)) = about 120 mg1 **habah** = the weight of a barleycorn1 **matu** = 1 carat

For gold in Southern Borneo during the nineteenth century, based on [POSE]

									Metric
ringit									27 g
2	sa djampal								13.5 g
5	2½	sa kopang							5.4 g
10	5	2	bunkaju						2.7 g
20	10	4	2	buntong					1.35 g
30	15	6	3	1½	stali				900 mg
40	20	8	4	2	1⅓	sa kilai			675 mg
120	60	24	12	6	4	3	brini		225 mg
240	120	48	24	12	8	6	2	mata burong	112.5 mg
480	240	96	48	24	16	12	4	2	bua bakong 56.25 mg

For gold and silver in Makassar, based on [MART3]

			Metric
tale			39.771 130 g
4	pahaw		9.942 782 g
16	4	mace	2.485 696 g

For gold, diamonds, bezoars and other precious stones at Succadana, based on [KELL]

					Metric
tale					39.68 g
4	pahaw				9.92 g
16	4	mace			2.48 g
64	16	4	copang		620 mg
128	32	8	2	busuck	310 mg

For gold in Melahui, in Western Borneo, based on [POSE]

					Metric
ringit					54 g
18	amas				3 g
36	2	djampul			1.5 g
72	4	2	suku		750 mg
144	8	4	2	stali	375 mg

For gold and silver in Java and at Batavia (present-day Jakarta) during the nineteenth century

		Metric	Metric
mark		246.106 g	246.084 g ^a
9	réal	27.345 g	27.343 g

^a=5120 Dutch As

For opium during the nineteenth century

			Metric
thail			36.601 g
100	tji or hun		366.01 mg
1000	10	tjembang, hoen, hoon, mata, or timbang	36.601 mg

Other trade measures used during the nineteenth and twentieth centuries:

- 1 **almane** or **almene** (for saffron) = 1126.67 kg;
- 1 **tanggung** (at Bali) = a weight that could be carried by two men with a shoulder pole;
- 1 **bale** = 180 kg;
- 1 **sack** (for cement) = 40 or 50 kg;
- 1 **gantang** (for rice in Makassar) = 5.659 929 kg;
- 1 **kulak** (for rice in Batavia, present-day Jakarta, during the twentieth century) = 4.614 kg;
- 1 **litre** (for rice) = 800 g;
- 1 **briquette** = 500 g;
- 1 **pon** = ~500 g;
- 1 **livre** (in Surabaya) = 492.20 g;
- 1 **amp** (for marijuana) = an envelope.

Metric scale after 1923

									Metric
ton									1000 kg
10	kwintal								100 kg
1000	100	kilogram							1 kg
10,000	1000	10	hektogram						100 g
100,000	10,000	100	10	dekagram					10 g
1,000,000	100,000	1000	100	10	gram				1 g
10,000,000	1,000,000	10,000	1000	100	10	desigram			100 mg
100,000,000	10,000,000	100,000	10,000	1000	100	10	sentigram		10 mg
1,000,000,000	100,000,000	1,000,000	100,000	10,000	1000	100	10	miligram	1 mg

28 Ionian Islands

See also *Corfu*.

These islands had been settled by the Greeks by the ninth century BC, but by the fourth century BC, most of the islands had come under the control of the Macedonian Kingdom. Around about 146 BC, the Greek peninsula was gradually annexed by the Roman Empire, during the mid-eighth century, the islands were passed to the Byzantine Empire, and from the twelfth century until the fifteenth century, the islands gradually became part of the Republic of Venice. In 1797, they came under French rule, and in 1798, the islands were established as the Septinsular Republic under Russo-Ottoman protection. In 1807, the islands were ceded once again to the French, and from 1809 until 1815, they were gradually ceded to the British Empire. On May 21, 1864, the Ionian Islands were officially reunited with Greece. During WWII, in 1941, the Axis powers took control of the islands. After WWII, they once more became part of Greece.

28.1 Units of Dry Capacity

For grain at Ithaka

		Metric
moggio		176.20 L
5	bacile	35.24 L

For wheat at Zakynthos

			Metric
staro			88.10 L
2	bacile		44.05 L
27	13½	oka	3.26 L

Other measures reported during the nineteenth century:

1 **cado** (at Lefkada) = 126.31 L;

1 **bacile** (at Argostoli, at Kefalonia) = 49.332 L;

1 **bacile** (for grain at Zante) = 35.512 L.

28.2 Units of Liquid Capacity

For wine at Kefalonia

				Metric
barila				81.828 L
6	secco			13.638 L
72	12	boccale		1.136 L
144	24	2	quartuccio	568 mL

For wine at Lefkada

			Metric
barila			81.828 L
6		secco	13.638 L

For wine at Paxo

			Metric
barila			68.134 L
4	jar		17.033 L
128	32	quartuccio	532 mL

For wine at Zante

			Metric
barila			66.96 L
60	agastera		1.116 L
120	2	quartuccio	558 mL

For oil at Kefalonia

		Metric
barila		81.828 L
9	pagliazzo	9.092 L

For oil at Lefkada

		Metric
barila		81.828 L
21	succalo	3.896 L

For oil at Zante

		Metric
barila		66.96 L
9	lire	7.44 L

Other reported measures:

1 **barile** (at Argostoli, at Kefalonia) = 68.134 L.

28.3 Units of Weight

						Metric
centinaio						47.699 9 kg
37½	oca					1.271 996 kg
100	2⅔	libbra grossa				476.999 g
1200	32	12	oncia			39.750 g
230,400	6144	2304	192	carato		207.031 mg
921,600	24,576	9216	768	4	grano	51.758 mg

Scale stated by an Act of Parliament on May 24, 1828, based on [MART, p. 599]

				Metric
libbra sottile				373.242 g
12	oncia			31.103 g
240	20	calco		1.555 g
5760	480	24	British troy grain	64.79 mg

Other reported measures:

- 1 **migliajo** (for currants) = 472.25 kg;
- 1 **cariolla** (for salt at Lafkada) = 47.22 kg;
- 1 **bacile** (at Kefalonia) = 38.16 kg (for wheat) and 30.53 kg (for salt);
- 1 **oca** (at Arezzo) = 32 once grosse di Venezia = 1.271 996 kg;
- 1 **Venetian libbra grossa** = 477.017 g.

29 Iran [Formerly: Persia]

The Kingdom of Persia was founded in 1501, when Isma'il raised an army of Turks and gradually established control over the area. In 1925, Reza Khan Pahlavi was elected Shah of Persia, and in 1926, his eldest son, Shahpur Mohammed Reza, was crowned as king. In 1931, it became known as

the Kingdom of Iran. In 1979, the monarchy was toppled and an Islamic Republic proclaimed.

Some assimilation with the metric system was adopted in 1924. In 1926, an attempt was made to equate the traditional Persian measures with the metric system, e.g., the gaz was fixed at 1 m. The metric system was officially adopted in January 8, 1933, and has been compulsory since 1949.

Main sources: [CARD], [CHVO], [ECON], [MART3], and [WASH]

29.1 Currency

- 1979–: 1 Iranian rial = 100 dinars
- 1945–1946: 1 Azerbaijan toman = 10 krans
- 1932–1979: 1 Iranian rial = 20 shahis = 100 dinars
- 1925–1931: 1 toman = 10 krans = 200 shahis = 1000 dinars
- 1825–1925: 1 toman = 10 krans, kerâns, or gharâns = 20 zaejiers = 50 abassis = 100 mamudis = 200 shahis = 1.000 dinars-bisti = 2000 kabsquis = 10,000 dinars
- 1500s–1825: 1 toman = 8 riyals = 10,000 dinars

29.2 Units of Length

Traditional upper scale (Assyrio-Chaldean-Persian system)

						Metric
stathmos						~25,600 m
3 ¹⁹ / ₂₇	schoëme					~6912 m
4	1 ⁷ / ₂₅	parasang				~6400 m
14 ²³ / ₂₇	4	3 ¹⁹ / ₂₇	mille			~1728 m
111 ¹ / ₉	30	27 ⁷ / ₉	7½	ghalva		~230.4 m
1000	270	250	67½	9	chebel	~25.60 m

Traditional lower scale (Assyrio-Chaldean-Persian system)

							Metric
chebel							~25.60 m
6⅔	qasab						~3.84 m
13⅓	2	panka					~1.92 m
40	6	3	arsani, ulna, or cubit (long)				~640 mm
80	12	6	2	zereth			~320 mm
320	48	24	8	4	dva		~80 mm
1280	192	96	32	16	4	aiwas	~20 mm

System based on [MART3]

				Metric
parasang				5603.490 m
3⅓	mille			1681.047 m
30	9	stadiu		186.783 m
13,800	4140	460	pik	406.0 mm

system based on [CHVO]

			Metric
vitasti			272 mm
10	angusta		27.2 mm

Other measures reported during the eighteenth–nineteenth centuries:

1 **mänzil** = ?;

1 **hasch** (in Turan during the nineteenth century) = 1.067 m;

1 **arisch, arish or arich** = 972.3 mm;

1 **shah-arisch** = 800.8 mm;

1 **guerze, gez, or monkelzer** = varied by location between 630 and 970 mm.

During the late nineteenth century

					Metric
farsakh^a					6110 m
6000	zer or gez				1.018 m
24,000	4	charak			245.6 mm
96,000	16	4	ghireh, gireh, or gareh		63.6 mm
192,000	32	8	2	bar	31.8 mm

^aVarying by location between 5065 and 6720 m

British Imperial-linked system before 1924

					Imperial	Metric
farsakh					6000 yd	5486.40 m
6000	zer or gez				1 yd	0.914 4 m
24,000	4	charak			¼ yd	228.6 mm
48,000	8	2	urub		⅛ yd	114.3 mm
96,000	16	4	2	ghireh, gireh, or gareh	⅓ yd	57.15 mm

System used after 1924

						Metric
farsakh, farsakh-song, farsang, or parasang^a						6240 m
6000	zar, arish, zaz, zer, or gaz					1.04 m
24,000	4	charac or charak				260 mm
48,000	8	2	ouroub or urub			130 mm
96,000	16	4	2	ghireh or gareh		65 mm
192,000	32	8	4	2	bar	32.5 mm

^aSometimes referred to as three times as far as the eye can see (Crane, Howard. (ed.) *Risāle-i mi'māriyye: an early-seventeenth-century Ottoman treatise on architecture: facsimile with translation and notes*. Brill Archive, 1987, p. 78)

Metric-linked system after 1926

							Metric
farsang or farsakh							10 km
$1\frac{1}{3}$	yojana						7.2 km
10,000	7200	guz, zar or gaz					1 m
40,000	28,800	4	charac or charak				250 mm
80,000	57,600	8	2	ouroub or urub			125 mm
100,000	72,000	10	$2\frac{1}{2}$	$1\frac{1}{4}$	gireh or gareh		100 mm
10,000,000	7,200,000	1000	250	125	100	mou	1 mm

Local scales during the nineteenth–twentieth centuries:

In Tauris before 1924

							Metric
barid							26,880 m
4	farsak						6720 m
24,000	6000	zer schahi					1.12 m
48,000	12,000	2	nim zer				560 mm
96,000	24,000	4	2	tscherek or tscheharek			280 mm
384,000	96,000	16	8	4	ghireh		70 mm
768,000	192,000	32	16	8	2	bar	35 mm

In Sciraz and Teheran before 1924

						Metric
zer mocasar						1.025 m
2	nim zer mocasar					512.5 mm
4	2	tscerek				256.25 mm
16	8	4	ghireh			64.062 mm
32	16	8	2	bar		32.031 mm

29.3 Units of Area

1 **gaz**² or **zar**² = 1.081 6 m².

Traditional system (Assyrio-Chaldean-Persian system)

					Metric
gur					14,745.6 m ²
10	gan				1474.56 m ²
100	10	ten			147.456 m ²
1000	100	10	gar		14.745 6 m ²
144,000	14,400	1440	144	zereth ²	10.24 dm ²

Before 1924

					Metric
scerib or jerib^a					1337.190 4 m ²
1066	zer murabé				1.254 4 m ²
17,056	16	tscerek murabé			7.84 dm ²
272,896	256	16	ghireh murabé		49.00 cm ²
1,091,584	1024	64	4	bar murabé	12.25 cm ²

^aVaried by location between 1294 and 1379 sq yd = 1081.95–1153.02 m² according to *Foreign trade requirements*. New York: Lewis, Scribner & Co., 1902, p. 467

Metric-linked system after 1924

				Metric
jerib				10,000 m ²
100	kafiz			100 m ²
1000	100	guz²		1 m ²
100,000	1000	100	gareh²	1 dm ²

29.4 Units of Volume

In Tauris before 1924

		Metric
zer muahkal		1.404 928 m ³
64	tscerek muahkal	21.952 dm ³

After 1924

1 **ralte** or **paimaneh** = 1 L.

Other reported measures:

1 **kurr** (for water in Teheran) = 4.875 L.

29.5 Units of Liquid Capacity

Traditional system, based on [MART3]

			Metric
acane			2367.000 L
45	artaba		52.600 L
1800	40	capita	1.315 L

In Teheran before 1924 (measured by weight)

						Metric
man						2.944 kg
8	sir					368 g
32	4	ponza				92 g
128	16	4	heftdrem			23 g
640	80	20	5	miscal		4.6 g
960	120	30	7½	1½	derhem	3.067 g

29.6 Units of Dry Capacity

For capacity measured by weight (Assyrio-Chaldean-Persian system)

								Metric
gariba								260.80 kg
$2\frac{2}{3}$	(long) amphora							97.80 kg
4	$1\frac{1}{2}$	(long) artaba						65.20 kg
$5\frac{1}{3}$	2	$1\frac{1}{3}$	(short) artaba					48.90 kg
8	3	2	$1\frac{1}{2}$	amphora				32.60 kg
16	6	4	3	2	woëbe			16.30 kg
64	24	16	12	8	4	makuk		4.075 kg
256	96	64	48	32	16	4	cados	1.019 kg

Traditional system

							Metric
ardab or artaba							66.032 L
$1\frac{2}{3}$	legana						39.619 L
8	$4\frac{20}{25}$	collothun or colluthun					8.254 L
$9\frac{9}{11}$	$5\frac{5}{11}$	$1\frac{7}{22}$	sabbitha or sabitha				7.264 L
25	15	$3\frac{3}{8}$	$2\frac{3}{4}$	cab, capicha, capisha, or capiche			2.641 L
50	30	$6\frac{1}{4}$	$5\frac{1}{2}$	2	chénica, schenica, or chemica		1.321 L
200	120	25	22	8	4	sextario	330.16 mL

In Tauris before 1924

							Metric
ardab or artaba							65.757 L
$1\frac{2}{3}$	Legana						39.454 L
8	$4\frac{20}{25}$	collothun or colluthun					8.220 L
$9\frac{9}{11}$	$5\frac{5}{11}$	$1\frac{7}{22}$	sabbitha or sabitha				7.233 L
25	15	$3\frac{3}{8}$	$2\frac{3}{4}$	cab, capicha, capisha, or capiche			2.630 L
50	30	$6\frac{1}{4}$	$5\frac{1}{2}$	2	chénica, schenica, or chemica		1.315 L
200	120	25	22	8	4	sextario	328.79 mL

Metric-linked system

					Metric
artaba					62.5 L
25	capicha or capisha				2.5 L
50	2	chénica			1.25 L
200	8	4	sextario		312.5 mL
250	10	5	1¼	fingan	250 mL

29.7 Units of Weight

Traditional system, based on [MART3]

			Metric
talanton			50.964 kg
60	maneh		849.400 g
6000	100	derhem	84.940 g

During the tenth–twelfth centuries

			Metric
charvar or karvar			~100 kg
10	fetr		~10 kg
120	12	man	~833 g

For silk in 1340

		Metric
Fardello		79.821 kg
252	libbre de Genoa	316.75 g

During the thirteenth–fourteenth centuries

		Metric
charvar or karvar		~83.3 kg
100	man	~833 g

During the fifteenth–eighteenth centuries

		Metric
charvar or karvar		288.0 kg
100	(large) man	28.8 g

For silk during the fifteenth century

		Metric
load		301.230 kg
2	some	150.615 kg

For silk in 1518

				Metric
yük				162.144 kg
8	bogča			20.268 kg
32	4	batman		5.067 kg
126⅘	15⅘	3 ¹⁹ / ₂₀	okka	1.283 kg

For silk c. 1600

		Metric
bale		90.000 kg
300	libber sottile	300 g

Upper scale during the Safavid dynasty (c. 1501–1736), based on [DAĞL]

												Metric
gez												2332.8 kg
12	vask											194.40 kg
60	5	kafiz										38.88 kg
96	8	1⅔	ruzme ^a									24.30 kg
480	40	8	5	mekkuk								4.86 kg
720	60	12	7½	1½	sâʿ							3.24 kg
1152	96	19⅓	12	2⅔	1⅔	istâz						2.025 kg
1440	120	24	15	3	2	1¼	müd					1.62 kg
2880	240	48	30	6	4	2½	2	menn				810 g
5760	480	96	60	12	8	5	4	2	ritl			405 g
224,640	18,720	3744	2340	468	312	195	156	78	39	miskal		10.4 g
748,800	62,400	12,480	7800	1560	1040	650	520	260	130	3⅓	dirhem	3.11 g

^aUsually used for silk. Also called **sikt**

Lower scale during the Safavid dynasty (c. 1501–1736)

				Metric
dirhem				3.11 g
	dânk			
6 $\frac{2}{3}$		kîrât		471 mg
33		5	barley grain	94 mg

For silk during the seventeenth century

		Metric
large bale		201.552 kg
408	Dutch pound	494 g

For silk in 1727

		Metric
divâni imle		61.547 kg
48	okka	1.282 kg

Scale reported during the mid-nineteenth century

				Metric
charvar or karvar				46.488 kg
100	rottel, ratel, or ratele			464.88 g
5000	50	dirhem		9.298 g
10,000	100	2	miscal	4.649 g

In Hormuz, then part of Portugal, during the late nineteenth century

					Metric
bahâr					207.422 57 kg
20	frâsila				10.371 12 kg
–	–	mann			961.03 g
–	–	24	quiaz		40.04 g
–	–	251 $\frac{1}{4}$	–	mithkâl	3.82 g

British Imperial-linked system used before 1924

					Imperial	Metric
tughar					4480 lb	2032.1 kg
20	wazma				224 lb	101.6 kg
80	4	mann			56 lb	25.401 kg
1600	80	20	hukka or hogga		2 $\frac{4}{5}$ lb	1.27 kg
6400	320	80	4	uqiya	$\frac{7}{10}$ lb	317.5 g

Traditional upper scale before 1924

							Metric
khavar, charvar, hohvar, or karvar							593.6 kg
50	rey or man-i-rey						11.877 kg
200	4	man or batman					2.968 kg
400	8	2	saddirhem, saddirham, or nim-man				1.484 kg
800	16	4	2	tcheirek, charak, tcharak, or tchorak			742 g
1280	25 $\frac{2}{5}$	6 $\frac{2}{5}$	3 $\frac{1}{5}$	1 $\frac{2}{5}$	rottel		463.75 g
1600	32	8	4	2	1 $\frac{1}{4}$	abbassi ^a	371 g

^aAccording to [UN66], the abbasi was equal to 371.1 g. During the early twentieth century, it was reported as about 368 g

Traditional middle scale before 1924

						Metric
abbassi						371 g
2	danar					185.5 g
4	2	pinar				92.75 g
5	2½	1¼	seer or sir			74.20 g
40	20	10	8	dirhem		9.275 g
80	40	20	16	2	miscal, miskal, or mitkal	4.638 g

Traditional lower scale before 1924 and rounded values after 1924

							Metric	Metric
miskal or mitkal							4.638 g	4.680 g
4½	dartung						1.030 7 g	1.040 g
6	1⅓	dung					773.0 mg	780.0 mg
24	5⅓	4	makhod or tasu				193.25 mg	195.0 mg
30	6⅔	5	1¼	nashod or nakhod			154.60 mg	156.0 mg
96	21⅓	16	4	3⅓	gandum or jhou		48.312 mg	48.75 mg
384	85⅓	64	16	12⅓	4	una	12.078 mg	12.187 5 mg

Metric-linked system after 1926

					Metric
charvar or karvar					300 kg
3000	seer or sir				100 g
30,000	10		miskal		10 g
300,000	100		10	dram	1 g

For medicine, gold and silver (traditional and rounded values)

							Metric	Metric
miskal							4.637 5 g	4.600 g
4⅞	dartung						1.020 25 g	1.012 g
6	1⅞	dung					772.917 mg	766.667 mg
24	5⅞	4	nashod, noshud, or neshud				193.229 mg	191.667 mg
25	5½	4⅞	1⅓	abbas			185.500 mg	184.000 mg
96	21⅞	16	4	3⅞	gendum, gandum, or gandom		48.307 mg	47.917 mg
384	84⅞	64	16	15⅞	4	una	12.077 mg	11.979 mg

For pearls

				Metric
miskal				4.600 g
23	chirat			200 mg
26⅔	1⅔	abbas		175 mg
34½	1½	1⅙	nashod, noshud, or neshud	133.333 mg

Some local scales used before 1926:

In Baghdad

					Metric
tughar					2000 kg
20	wazma or wazna				100 kg
80	4	mann			25 kg
480	24	6	hukka or hogga		4.167 kg
1920	96	24	4	uqiya or okiya	1.041 7 kg

At Bushehr

			Metric
batman			3.485 2 kg
720		mithqal	4.84 g

In Isfahan, based on [MART3]

			Metric
halvar asbi			117.504 000 kg
20	man		5.875 200 kg
25,600	1280	mithqal	4.59 g

In Mosul

						Metric
tughar						266.864 kg
20	wazma or wazna					13.343 2 kg
21⅔	1⅓	(small) mann				12.316 8 kg
130	6½	6	(large) hukka or hogga			2.052 8 kg
173⅓	8⅓	8	1⅓	(small) hukka or hogga		1.539 6 kg
2080	104	96	16	12	uqiya or okiya	128.3 mg

For silk at Recht

		Metric
man-i-shah		5.888 000 kg
2	man-i-teheran	2.944 000 kg

At Shiraz

		Metric
batman		5.752 1 kg
600	mithqal	9.59 g

In Tabriz

				Metric
man				2.876 1 kg
6	rotel			479.35 g
300	50	dirhem		9.59 g
600	100	2	mithqal	4.79 g

In Tauris

					Metric
batman					2.790 kg
6	zatakes				465 g
300	50	dirhem			9.30 g
600	100	2	mithqal		4.65 g
3600	600	12	6	dung	775 mg

30 Iraq

See also *Ottoman Empire*.

In 539 BCE, Mesopotamia became a province of Persia, and then part of the Alexandrian empire. In 312 BCE, the area came under the Seleucid Empire. After a period of Parthian reign, the area was dominated by the Sassanids. The Sassanians ruled Iraq from about 220. In 656, Arabs took the Sassanid Empire into their possession, and in 1055, the Turkish Seljuq sultan Tughril Beg established control over present-day Iraq with the support of the ‘Abbasid caliph al-Qa’im. The Mongols captured Baghdad in 1258. Despite incursions by Timur in 1400 and an Iranian invasion in 1504, the Ottoman Empire established themselves in Iraq in 1534. At the Paris Peace Conference in 1919, it was decided that Iraq would become a British mandate under the League of Nations. Present-day Iraq, which had not previously existed as a separate nation,

was a merger of the three former Ottoman provinces: Bagdad, Basra, and Mosul. Iraq was a British protectorate until 1932 when it became independent.

The metric system has been official since 1930 and compulsory since 1960.

Main sources: [EHRE] and [INAL]

30.1 Currency

- 1932–: 1 Iraqi dinar = 10 riyal = 20 dirham = 1000 fils
- 1922–1932: 1 Indian rupee = 16 anna
1 Egyptian pound = 100 piastres = 1000 illiemes
- 1922: 1 Turkish pound or lira = 100 piastres

30.2 Units of Length

During the Middle ages

								Metric
farsakḥ								5985 m
3	mīl							1995 m
150	50	ṭanāb or ashl						39.9 m
3000	1000	20	kāma or bā^c					1.995 m
9000	3000	60	3	Hāshimī cubit				665 mm
12,000	4000	80	4	1½	dḥar^c or gaz			498.75 mm
72,000	24,000	480	24	8	6	ḳabḍa^a		83.125 mm
288,000	96,000	1920	96	32	24	4	aṣba^{cb}	20.781 25 mm

^aHandsbreadth

^bFingerbreadth

Other measures reported during the nineteenth century:

- 1 **guz** or **covid** (in Basra) = 1.025 m, but also reported as 939.778 mm;
 1 **yard** = 914.4 mm;
 1 **pik** (for cotton and canvas from Hadded) = 868.60 mm;
 1 **pik** (for fabric from Bagdad) = 802.63 mm;
 1 **dhra** = 745 mm;
 1 **pik** (for wool and silk from Aleppo) = 685.80 mm;
 1 **akid** = ~50.3 mm.

30.3 Units of Area

In Bagdad

		Metric
faddān or feddan		195,000 m ²
200	dönüm or dünam	975 m ²

Metric-linked system for agricultural use

			Metric
faddān or feddan			50,000 m ²
20	mishara, meshara, dönüm or dünam		2500 m ²
500	25	olc	100 m ²

30.4 Units of Dry Capacity

Usually, all commodities were sold by weight.

Traditional system

				Metric
kurr				~3600 L
30	kara			~120 L
60	2	qafiz		~60 L
480	16	8	makuk	~7.5 L

Other reported measures:

- 1 **farq** (in Bagdad) = 19 L.

30.5 Units of Liquid Capacity

Usually, all commodities were sold by weight.

For vegetable oils and petrol

		Metric
tin		18.184 36 L
4	gallon	4.546 09 L

30.6 Units of Weight

Various measures reported during the seventh century:

- 1 **makkūk** (in Basra and Wāsiṭ) = about 6 kg;
 1 **makkūk** (in Bagdad and Kufa) = 5% kg.

Traditional system at Bagdad during the sixteenth century

		Metric
vezne		100.066 kg
78	okka	1.282 9 kg

At Basra during the fourteenth–sixteenth centuries

			Metric
kara			2565.9 kg
10	tagār		256.59 kg
2000	200	okka	1.283 kg

At Mosul during the sixteenth century

		Metric
vezne or vezniye		12.282 kg
10	okka	1.228 2 kg

At Mosul during the sixteenth–seventeenth centuries

			Metric
himi			243.75 kg
300	man		812.5 g
600	2	rattl	406.25 g

Maund scale at Bagdad during the eighteenth–nineteenth centuries

				Metric
maund				8.079 610 9 kg
3	batman			2.693 204 kg
6	2	okka		1.346 602 kg
2400	800	400	dirhem or derhem	33.665 g

Wazma-scale at Bagdad (traditional and metric-linked system) during the eighteenth–nineteenth centuries

					Metric	Metric
tughar					1997.9 kg	2000 kg
20	wazma				99.90 kg	100 kg
80	4	mann			24.97 kg	25 kg
480	24	6	hukka		4.162 kg	4.167 kg
1920	96	24	4	oqiya	1.040 6 kg	1.041 7 kg

At Bagdad during the late nineteenth century

									Metric
tegar									646.368 kg
3%	cantar								181.791 kg
20	5%	vesneh^a							32.318 40 kg
80	22½	4	mahnd^b						8.079 60 kg
160	45	8	2	rotl					4.039 8 kg
320	90	16	4	2	tsciarac				2.019 9 kg
480	135	24	6	3	1½	oca			1.346 6 kg
1920	540	96	24	12	6	4	vachia		336.650 g
7680	2160	384	96	48	24	16	4	rube	84.162 5 g

^a1 **vesneh** (for rice and grain) = 60.597 00 kg

^b1 **mahnd** (for rice and grain) = 11.446 10 kg

In Basra

						Metric
tughar						2052.8 kg
20	wazma or wazna					102.64 kg
26⅔	1⅓		mann			76.98 kg
32	1⅝		1⅝	mann		64.15 kg
640	32		24	20	uqiya or okiya	3.207 5 kg

For gold and silver at Bagdad during the late nineteenth century

					Metric
rube					84.162 5 g
16⅔	miscal				5.049 75 g
25	1½	dirhem			3.366 50 g
400	24	16	habbeh		210.4 mg
1600	96	64	4	schairât	52.6 mg

For gold and silver in Basra during the late nineteenth century

			Metric
tsechi			466.500 g
100	miscal		4.665 g
150	1½	dirhem	3.110 g

At Basra during the eighteenth–nineteenth centuries

		Metric
maund^a		40.936 696 kg
25	wakia	1.637 468 kg

^aAlso reported as 26 wakias = 42.574 164 kg

Attari-scale at Basra during the eighteenth–nineteenth centuries

				Metric
maund attari				12.927 377 3 kg
1 ⁹ / ₂₉	rotolo			7.810 290 4 kg
9 ³ / ₅	5 ⁵ / ₅	okka		1.346 601 8 kg
24	14½	2½	wakia attari	538.641 g

Other reported measures:

- 1 (large) **kara** (in Basra) = 2 kara = 2540.118 812 kg;
- 1 **tegar** (for rice and barley in Basra) = 3055 lbs = 1385.725 530 kg;
- 1 **kara** (in Basra) = 2800 lbs = 1270.059 406 kg;
- 1 **kintar** = 274.27 kg;
- 1 **kutra** (in Basra) = 114 vachia attari = 63.019 125 kg;
- 1 **maund sofi** (for rice in Basra) = 78½ vachia attari = 42.282 062 kg;
- 1 **maund sofi** = 25 vachia sofi = 76 vachia attari = 40.935 500 kg;
- 1 **maund attari** (for coffee, pepper and juniper in Basra) = 26 vachia attari = 14.004 250 kg;
- 1 **maund attari** (for sugar and drugs in Basra) = 25 vachia attari = 13.465 625 kg;
- 1 **maund attari** (for general use in Basra) = 24 vachia attari = 12.927 000 kg;
- 1 **batman** (at Mosul) = 9.236 kg;
- 1 **rotolo** (in Basra) = 14½ vachia attari = 7.810 062 kg;

1 **batman** (for silk at Mosul) = 800 dirhem = 2.566 kg;

1 **vachia sofi** = 1.637 420 kg;

1 **vachia attari** = 538.625 g;

1 **miskal** (for gold and silver) = 4.665 57 g.

31 Ireland [Formerly: Irish Free State; Eire]

This island was divided into five loosely federated kingdoms, Ulster, Connacht, Leinster, Mide and Munster, before the Norman invasion. In 1154, Adrian IV gave all of Ireland to English King Henry II to administrate as a Papal fief. The Kingdom of Ireland formed a personal union with England in 1541. The Republic of Ireland declared its independence in 1919, and the Irish Free State was established in 1922. Ireland was known as the Irish Free State from 1923 until 1937, as Eire from 1937 until 1949, and as the Republic of Ireland since 1949.

The Irish system of units was influenced by the Celtic, Norse, Roman and English systems. In 1351, it was enacted in the English Parliament that the same weights and measures should be used in Ireland as were used in England. Ireland adopted the Imperial Weights and Measures Act in 1824, but the old system was officially in use until 1896. The metric system has been official since 1897 and compulsory since 1968–1969.

Main sources: [BLOU], [DOLA], [DUTT], [FLET, pp. 103–104], [HMSO, p. 335], [JOYC2], [KELL2, p. 99], [KELL3], [LEWI6], [MCER], [MEYE5], [MUIR], [PETR5, pp. 217–218], [ROGE, pp. 394–395], [SEEB], and [WAKE2]

31.1 Currency

1999–: 1 euro = 100 euro-cent

1971–2002: 1 Irish pound (*Punt Éireannach*) = 5 crowns = 20 new shillings = 100 new pence

1938–1971: 1 Irish pound (*Punt* Éireannach) = 20 shillings = 240 pence
1928–1937: 1 Saorstát punt = 20 scillingí = 240 pingíní
1826–1927: 1 pound sterling = 20 shillings = 240 pence = 960 farthings
1300s–1826: 1 pound = 20 shillings = 240 pence
6th–1300s: 1 screpall = 3 pinginn
–sixth century: 1 crosoc

of value, considered equal in value to one ounce of gold.

		cows
cumal		3
3	séd	1

31.2 Units of Length

Ancient measure:

1 **magh-space** = the distance from which a cock-crow or bell could be heard.

In ancient times, the Irish had little or no money. They paid with corn and cattle, and traded among themselves through the bartering of goods and various commodities. A sack of oats or barley was referred to as a miach. A full-grown cow, or ox, was a general standard

The earliest known system was mentioned in the Brehon Laws, a system of laws that had been passed on orally from one generation to the next until the seventh century CE, when the laws were written down for the first time. These laws were preserved and interpreted by the Brehons, the successors to the Celtic druids. This system was probably in use well into the twelfth century.

Traditional Brehon system (assuming the grain-length to equal about 7 mm)

											Metric
side of the land of a cumal ^a											435.456 m
12	forrach										36.288 m
24	2	lait									18.144 m
144	12	6	fertach ^b								3.024 m
288	24	12	2	deiscéim							1.512 m
576	48	24	4	2	céim ^c						756 mm
1728	144	72	12	6	3	troighid ^d					252 mm
3456	288	144	24	12	6	2	dorn ^e				126 mm
5184	432	216	36	18	9	3	1½	bas ^f			84 mm
20,736	1728	864	144	72	36	12	6	4	ordlach ^g		21 mm
62,208	5184	2592	432	216	108	36	18	12	3	grain of wheat	7 mm

^aThe cumal is generally considered to be a piece of land worth three milk cows
^bAlso spelled **fertaig** or **fertaigh**
^cSometimes reported as 2½ troigids
^dThe length of a man’s foot. Also spelled **troigid**
^eThere was a fist with the thumb closed, called a **mail-dorn** = five orlachs, and a fist with the thumb extended, called a **airtem-dorn** = six orlachs
^fThe width of the hand at the roots of the fingers. Also spelled **bass**
^gThumb-measure

Falange Leix system (Queens Surveyors’ system) and Falange Offaly (Kings Surveyors’ system) during the fourteenth century

											Metric
Erse^a mile											2048.247 040 m
8	Erse furlong^b										256.030 880 m
37½	4⅔	forrach									54.863 760 m
320	40	8⅔	Erse pole^c								6.400 772 m
448	56	12	1⅕	fertach							4.571 980 m
1120	140	30	3½	2½	piece						1.828 792 m
2688	336	72	8⅔	6	2⅔	céim					761.997 mm
3360	420	90	10½	7½	3	1¼	bannlám^d				609.597 mm
5376	672	144	16⅕	12	4⅕	2	1⅓	troighid			380.998 mm
20,160	2520	540	63	45	18	7½	6	¾	bas		101.599 mm
80,640	10,080	2160	252	180	72	30	24	15	4	ordlach	25.399 mm

^aOften used for Irish, from *Erische*
^bAlso referred to as a **fusilshot** or **bowshot**
^cAlso referred to as a **rod** or **lug**
^dAlso spelled **bannlámh** or **banlám**

System used before 1824

											Metric
Irish mile											2048.247 040 m
8	Irish furlong										256.030 880 m
80	10	Irish Gunters’ chain									25.603 088 m
320	40	4	Irish pole								6.400 772 m
480	60	6	1½	fathom							4.267 181 m
2240	280	28	7	4⅔	yard						914.396 mm
4480	560	56	14	9⅓	2	cubit					457.198 mm
6720	840	84	21	14	3	1½	foot				304.799 mm
8000	1000	100	25	16⅔	¾	1⅓	1⅔	link			256.031 mm
80,640	10,080	1008	252	168	37½	18	12	10⅔	inch		25.399 mm

for linen cloth from at least the early seven-
teenth century until the late eighteenth century:

1 **bundle** (in Kerry, according to [LEWI6]) = 14 in = 355.586 mm.

- 1 **bundle** (in Galway) = 30 in = 761.970 mm;
1 **bundle** (in most counties) = 27 in = 685.773 mm;
1 **bundle** (in Kilkenny) = 24 in = 609.576 mm;
1 **bundle** (in Limerick) = 21 in = 533.379 mm;

For yarn during the eighteenth–nineteenth centuries

			Metric
bundle			65,836.209 m
20	hank		3291.810 m
240	12	lea	274.317 m

31.3 Units of Land Area

During archaic times, pasture was reckoned according to the amount of stock it supported annually, whereas arable land was often measured by a fixed number of ploughing days. During the sixteenth century, from which many written sources are preserved, different standards of measurement had long been applied according to the quality and situation of the land, e.g., the

proportion of arable, coarse and mountain pasture, as well as its proximity to routeways, fairgrounds and mills. This means that land measures often varied significantly from place to place, even within the same county. This means that it is now impossible to give an accurate description of the archaic land measures. At any rate, we have some written sources from the late sixteenth and early seventeenth centuries that give us data on the relative proportions between some units of land measurement.

Celtic denomination of land areas during the mid-sixteenth century and approximate metric values

					Metric
ballybiatagh					~550.4 ha
4	ceathramh				~137.6 ha
8	2	ochdamh			~68.8 ha
16	4	2	cota-ban		~34.4 ha
32	8	4	2	da-sgillín	~17.2 ha

Land assessment systems for counties in Ulster during the early seventeenth century, mainly based on [MCER]

County	Large unit	Intermediate unit	Small unit	Minor units	Subdivisions
Antrim (now part of Northern Ireland)			town	quarter	
Armagh (now part of Northern Ireland)			ballyboe	sessiagh	
Cavan	ballybetagh	quarter	poll	pottle	
Derry	ballybetagh	quarter	ballyboe	sessiagh	
Donegal	ballybetagh	quarter	ballyboe	sessiagh	gort
Down (now part of Northern Ireland)		quarter	ballyboe	sessiagh	
Fermanagh (now part of Northern Ireland)	ballybetagh	quarter	tate		
Monaghan	ballybetagh	quarter	tate		
Londonderry (now part of Northern Ireland)	ballybetagh		ballyboe	sessiagh	gort
Tyrone (now part of Northern Ireland)	ballybetagh		ballyboe	sessiagh	gort

Land assessment systems for counties in Connacht during the early seventeenth century, mainly based on [MCER]

County	Large unit	Intermediate unit	Small unit	Minor units
Galway	baile	quarter	cartron	gnive
Leitrim	baile	quarter	cartron	gnive
Mayo	baile	quarter	cartron	gnive
Roscommon	baile	quarter	cartron	gnive
Sligo	baile	quarter	cartron	gnive

Land assessment systems for counties in Leinster during the early seventeenth century, mainly based on [MCER]

County	Large unit	Intermediate unit	Small unit	Minor units
Carlow		martland	fractions of martland	
Dublin			ploughland	
Kildare			ploughland	
Kilkenny			ploughland (horseman's bed)	
Leix		quarter	cartron	
Longford		quarter	cartron	
Louth			ploughland	
Maeth			ploughland	
Offaly		quarter	cartron	
Westmeath		quarter	cartron	
Wexford (Northern part)		martland	fractions of martland, as shillingland, groatland and pennyland	
Wexford (Southern parts)			ploughland	
Wicklow			ploughland and cowland	

Land assessment systems for counties in Munster during the early seventeenth century, mainly based on [MCER]

County	Large unit	Intermediate unit	Small unit	Minor units
Clare		quarter or cahirfadda	cartron or carrowmeer	seiseadh
Cork		quarter	ploughland	gnive
Kerry		quarter	ploughland	gnive
Limerick		quarter	carrowmeer	octomeer
Tipperary North			ploughland	
Tipperary South	colp or capell land	quarter or quatermeer	fractions of colp	
Waterford			ploughland or oxland	

A compilation of traditional measures, mainly based on [LARC] and [MACC]

									Metric
triocha céad^a									94,389,034 m ²
3½	tuath^b								28,316,710 m ²
30	9	ballybetagh^c							3,146,301 m ²
120	36	4	seisreagh^d						786,575 m ²
240	72	8	2	tate^e					393,288 m ²
480	144	16	4	2	cartron^f				196,644 m ²
720	216	24	6	3	1½	sessiagh^g			131,096 m ²
1440	432	48	12	6	3	2	gneeve		65,548 m ²
14,400	4320	480	120	60	30	20	10	acra	6554.8 m ²

^aAlso called a **barony**

^bAlso called **ballibetagh** or **triucha**. This was a traditional term for a petty kingdom

^cAlso called a **townland**. It could also be equal to 12 or 16 tates. By some sources, reported as the area considered sufficient to graze 300 cows

^dAlso called **ploughland**, **carrow**, **carucate**, or **ceathrú**. At the end of the fifteenth century, this was the fiscal unit of arable land, not counting rivers, meadows, moors, pastures, hills and woods

^eAlso called **ballyboe**, in Gaelic areas, and **leath-ceathrú**, in Clare. It was reported as an area of land sufficient for grazing four herds of 75 cows. (According to [MCCA2, p. 97])

^fAlso called **carrowmeer**

^gAlso called **seiseadh**

Land areas were also divided into parts based on how much an area was worth. For example, the **tie cumhaile**, or **tircumaile**, referred to the area of land worth a cumhal, or considered sufficient to graze three cows. According to the Brehon laws, it may be estimated as equal to about 12 forrachs 6 forrachs = $3\frac{1}{4}$ English acres = 138.6 m².

The **tie cumhaile** was also the measurement that determined the rank of the owner to which the proprietor belonged. Thus, the og-aire (the lowest rank of nobility) consisted of those who owned one tie cumhaile of land. Each grade from that upwards possessed a tir cumhaile more than the next grade below, until we reach the rí tuaithe, who owned a tir secht-cumhal, or a land worth seven tir cumhals.

For many centuries, there were many Irish acres or acras in use. Some were referred to as “large acres” and some as “small acres.” Even those seem to have varied in size by location. During the early nineteenth century, at least two specific values were reported:

- 1 **Irish acre, Irish plantation acre, Lancashire acre, or Churchland acre** = 7840 sq yd = 6554.9 m²;
- 1 **Cunningham acre or Conyningham acre** (in Eastern Ulster) = 6250 sq yd = 5226 m².

31.4 Units of Dry Capacity

Some vague measures of capacity:

- 1 **milch-cow vessel** = a vessel, when full, that a person of ordinary strength could lift as high as his knees;
- 1 **heifer-vessel** = a vessel, when full, that a person of ordinary strength could raise to his navel;
- 1 **small heifer-vessel** = a vessel, when full, that a person of ordinary strength could raise to his loins;
- 1 **dairt heifer-vessel** = a vessel, when full, that a person of ordinary strength could raise over his head;
- 1 **ladhar** = a large handful.

Other measures reported during the seventeenth–nineteenth centuries:

- 1 **hoggat or bow** (for cereals in Down) = $2\frac{1}{2}$ Bristol barrels = ~181.84 L;
- 1 **lime-barrel** = 40 gal. of $217\frac{1}{2}\%$ cu in = ~142.62 L, according to [WAKE2, p. 200] only 32 gal. = ~114.09 L;
- 1 **miach** (for barley, malt,oats, and corn) = a sack of cereals worth a screpall of silver;
- 1 **skibbal or skibbet** (for oats in County Clare, according to [DUTT]) = 2 bushels or 7 stones;
- 1 **cronnog** = a basket or hamper for holding corn of no certain dimension, but generally presumed to equal 1 Bristol barrel = ~72.74 L; in Cork = 3 Bristol barrels = ~218.21 L, and in Limerick = 2 Bristol barrels = ~145.47 L;
- 1 **lime-bushel** (in Monaghan) = 46 quarts = ~52.28 L;
- 1 **meader** = a vessel of no certain dimension.

Traditional system, based on [CONN3, p. 94], [COMM3, p. 334–337] and [WEST3]

						Metric
olpatrick or oilmedach						95.04 L
2	olfeine ^a					47.52 L
12	6	ollderbh or olderb				7.92 L
144	72	12	méisrin ^b			660 mL
432	216	36	3	sellann ^c		220 mL
1728	864	144	12	4	eggshell ^d	55 mL

^aAlso reported as two olpatrick

^bWhen used for ale, milk, and whey, usually called **bochtan**

^cIt was usually used for honey

^dA moderate hane’s eggshell was used as a standard unit

31.5 Units of Liquid Capacity

For tar in 1533

		Metric
Bristol last		872.85 L
12	Bristol barrel	72.74 L

Upper scale used before 1824

								Metric
pipe								1198.117 242 5 L
2	tun							599.058 621 23 L
4	2	puncheon or hogshead						299.529 310 62 L
8	4	2	tierce					149.764 655 31 L
10 ² / ₃	5 ¹ / ₃	2 ² / ₃	1 ¹ / ₃	barrel				112.323 491 482 L
18 ² / ₃	9 ¹ / ₃	4 ² / ₃	2 ¹ / ₃	1 ³ / ₄	rundlet			64.184 852 275 2 L
224	112	56	28	21	12	srone^a		5.348 737 689 6 L
336	168	84	42	31 ¹ / ₂	18	1 ¹ / ₂	gallon^b	3.565 825 126 4 L

^aFor oatmeal

^b217²/₃ cu in

Lower scale used before 1824

					Metric
gallon					3.565 825 126 4 L
2	pottle				1.782 912 563 2 L
4	2	quart			891.456 281 6 mL
32	16	8	pint^a		111.432 035 2 mL
128	64	32	4	noggin	27.858 008 8 mL

^aThe Imperial pint was called 1 **jar** ([DOLA, p. 148])

31.6 Units of Weight

Traditional money weight system, with estimated values

						Metric
dirna						167.904 g
6	mann or unga^a					27.984 g
144	24	screpall or sigal				1.166 g
192	32	1 ¹ / ₃	crosòc^b			0.874 g
432	72	3	2 ¹ / ₄	pinginn		0.389 g
3456	576	24	18	8	grain ^c	0.049 g

^aDuring the ninth century, the old mann had become obsolete, and the new name for this measure, the unga, had come into general use

^bThe crosòc probably fell out of use when the screpall and pinginn were introduced during the fifth or sixth century

^cOne grain of wheat, which grew in a soil of three roots, i.e., the richest soil, known by the presence of three weeds, remarkable for their large roots, namely the thistle, the ragwort, and the wild carrot

Proposed avoirdupois-linked apothecaries' system in 1850, see [RCPD]

					Metric
libra					453.729 6 g
16	uncia				28.358 1 g
128	8	drachma			3.544 8 g
384	24	3	scrupulum		1.181 2 g
7000	437½	54 ³³ / ₄₈	18 ¹ / ₄₈	grana	64.8 mg

Some other measures reported during the nineteenth century:

- 1 **barrel** (for wheat, rye, peas, beans and potatoes in Bristol) = 20 stones = 280 lbs = 127.006 kg;
- 1 **barrel** (for barley, bere and rape seed in Bristol) = 16 stones = 224 lbs = 101.605 kg;
- 1 **barrel** (for oats in Bristol) = 14 stones = 196 lbs = 88.904 kg;
- 1 **barrel** (in Bristol; for malt) = 12 stones = 168 lbs = 76.203 kg;
- 1 **quarren** (for butter) = ~1.8 kg.

32.1 Currency

- 1840-: 1 pound sterling = 12 shillings = 240 pence
- 1840: 1 Manks pound = 20 shillings = 240 pence

33 Israel

See also *(Mandatory) Palestine*.
This area was under the control of the Arab Caliphate from 638 until 1099, the Crusaders from 1099 until 1187, the Mamluks of Egypt

31.7 Units of Time

									Metric
lá, láa, láe, or lát^a									a day
4	cadar								a quarter of a day
24	6	uair							60 minutes
96	24	4	pongc						15 minutes
240	60	10	2½	minúite					6 minutes
360	90	15	3¾	1½	pars				4 minutes
600	150	25	6¼	2½	1⅓	bratha			2 min 24 seconds
900	225	37½	9⅜	3¾	2½	1½	ostent		1 min 36 seconds
338,400	84,600	14,100	3525	1410	940	564	376	atom	12/47 of a second

^aAlso spelled **dia** or **die**

32 Isle of Man

Vikings came to this island during the ninth century and remained until they were ejected by the Scottish in 1266. The Isle of Man became a Scottish fiefdom in 1266, an English fiefdom in 1334, and a British possession in 1765.

from 1270 until 1516, and the Ottoman Empire from 1517 until 1917. The British occupied the area in 1918, and Israel gained its independence in 1948.

The metric system has been used in former Palestina since 1928, became legally adopted in 1947 and has been compulsory since 1954.

33.1 Currency

1985–:	1 new Israeli shekel = 100 new agorot
1980–1985:	1 Israeli shekel = 100 agorot
1960–1980:	1 Israeli pound or lira = 100 agourot
1949–1960:	1 Israeli lira = 1000 prutot
1948–1949:	1 Israeli pound = 1000 mils
1927–1948:	1 Palestine pound = 1000 mils 1?? = 9½ rubles = 141 grush or piasters (in gold) 1 medjidi = 4 yozeres = 26 grush (in silver)

33.2 Units of Length

1 draa or dhraa = 750 mm;
1 pik = 677.321 mm.

33.3 Units of Area

1 dönüm = 1000 m ² .

33.4 Units of Dry Capacity

1 ardeb = 254.58 kg;
1 dirara (in Jerusalem) = 795 L.

In Acre

		Metric
grora		1299.6 L
36	kile	36.1 L

33.5 Units of Liquid Capacity

Liquids were generally sold by weight.

33.6 Units of Weight

For raw cotton and cotton yarn at Acra

		Metric	Metric
kantar		220.703 kg	203.725 kg
100	rotolo	2.207 03 kg	2.037 25 kg

For oil at Jaffa

		Metric
giarra		19.215 547 kg
15	oca	1.281 036 kg

For soap and wool at Jaffa

		Metric
cantar		288.233 199 kg
225	oca	1.281 036 kg

For cotton at Jaffa

		Metric
cantar		336.272 065 kg
262½	oca	1.281 036 kg

34 Italian East Africa

See *Ethiopia*

35 Italian Somaliland

See also *Somalia*.

35.1 Currency

1950–1962:	1 Italian Somaliland somalo = 100 centesimi (shantiismi)
1941–1950:	1 East African shilling = 100 cents
1938–1941:	1 Italian East African lira = 100 centesimi
1925–1938:	1 Italian Somaliland lira = 100 centesimi
1909–1925:	1 Italian Somaliland rupis = 64 bese (Beeso)
–1909:	1 Maria Theresa Thaler

36 Kingdom of Italy (Napoleonic)

See also *Italy*.

This state in Northern Italy was founded by Napoleon in 1805. It consisted of the former Duchy of Mantua, Duchy of Milan, Duchy of Modena, Novara, part of Romagna and the western part of the Republic of Venice. In 1806, the Duchy of Guastalla and the remaining part of the Venetian territories were annexed. In 1807, Italy gained Gradisca and ceded Monfalcone to Austria. In 1810, present-day Marches and the southern Tirol became part of Italy, and Istria and Dalmatia were ceded to France. In 1814, the kingdom ended with the fall of Napoleon and the area was divided between the Kingdom of Lombardy-Venetia and the Duchy of Modena.

36.1 Currency

1807–1814: 1 Italian lira = 20 soldi = 100 centesimi

During the late Middle Ages, present-day Italy was divided into smaller states. The main territories were: Florence, Genoa, Milan, Naples and Venice. Other important city-states and territories were Bologna, Modena, Rome and Turin. The Kingdom of Italy was established in 1861. Venice was annexed in 1866 and the Papal States in 1870.

From the later centuries of the Roman republic to the declining years of the Roman Empire, present-day Italy had a uniform and standardized system of weights and measures. As the centralized government fell, local native metrological systems came into use. The metric system was officially adopted in 1861 (in Milan from 1803) and has been compulsory since 1863.

Main sources: [CURC], [DOUR], [EDLE], [FERR], [MART3], [SIVI], [UN55], [UN66], and [ZUPK4]

37.1 Currency

1999–: 1 euro = 100 euro-cent
1862–2002: 1 Italian lira = 100 centesimi

37 Italy

See also *Kingdom of Italy (Napoleonic)* and *the Papal States*.

37.2 Units of Length

Before 1861

							Metric
miglio							2226.319 20 m
722%	trabucco						3.082 595 82 m
1 083⅓	1½	canna					2.055 063 88 m
4 333⅓	6	4	piede liprando				0.513 765 97 m
52,000	72	48	12	oncia			42.813 83 mm
624,000	864	576	144	12	punto		3.567 82 mm
7,488,000	10,368	6912	1728	144	12	atomo	297.3 µm

Metric-linked system after 1861

						Metric
miglio						1 km
1000	braccio					1 m
10,000	10	palmo				1 dm
100,000	100	10	dito or oncia			1 cm
1,000,000	1000	100	10	atomo		1 mm

Metric upper scale after 1880

					Metric
miriametro					10,000 m
10	chilometro				1000 m
100	10	ettometro			100 m
1000	100	10	decametro		10 m
10,000	1000	100	10	metro	1 m

Metric lower scale after 1880

				Metric
metro				1 m
10	decimetro			100 mm
100	10	centimetro		10 mm
1000	100	10	millimetro	1 mm

For maritime use

			Metric
lega marittima			5556.031 111 m
3	miglio marino		1852.010 370 m
360	120	nodo	15.433 420 m

37.3 Units of Area

Metric system after 1880

							Metric
miriametro quadro							1,000,000 a
100	chilometro quadro						10,000 a
10,000	100	ettaro					100 a
1,000,000	10,000	100	aro				100 m ²
100,000,000	1,000,000	10,000	100	centiario			1 m ²
10,000,000,000	100,000,000	1,000,000	10,000	100	decimetro quadro		1 dm ²
1,000,000,000,000	10,000,000,000	100,000,000	1,000,000	10,000	100	centimetro quadro	1 cm ²
100,000,000,000,000	1,000,000,000,000	10,000,000,000	100,000,000	1,000,000	10,000	100	millimetro quadro 1 mm ²

For maritime use

		Metric
lega marina quadra		30,869,481.706 4 m ²
9	miglio geografico quadro di 60 al grado	3,429,942.118 m ²

Other reported measures:

- 1 **quadrao** or **gionata** = 38 a;
1 **tavola** = 38 m².

37.4 Units of Volume

Metric system after 1880

					Metric
decametro cubo					1000 m ³
1000	metro cubo				1 m ³
1,000,000	1000	decimetro cubo			1 dm ³
1,000,000,000	1,000,000	1000	centimetro cubo		1 cm ³
1,000,000,000,000	1,000,000,000	1,000,000	1000	millimetro cubo	1 mm ³

Metric system for firewood

			Metric
decastero			10 m ³
10	stero		1 m ³
100	10	decistero	100 dm ³

37.5 Units of Dry Capacity

For cereals in Latium

							Metric
rubbio							294.39 L
2	rubbialillo						147.195 L
4	2	quarto					73.597 5 L
8	4	2	quarto rella				36.798 75 L
12	6	3	1½	staro or stajo			24.532 5 L
16	8	4	2	1⅓	starello		18.400 L
44	22	11	5½	3⅔	2¾	scorzo	6.690 9 L

Other reported measures:

1 **mine** = varied by location between 12 and 120 L.

Metric system after 1880

						Metric
ettolitro						100 L
10	decalitro					10 L
100	10	litro				1 L
1000	100	10	decilitro			100 mL
10,000	1000	100	10	centilitro		10 mL
100,000	10,000	1000	100	10	millilitro	1 mL

37.6 Units of Liquid Capacity

Some reported measures during the late nineteenth century:

1 **barile da olio** (for oil) = 33.4 L;

1 **barile da vino** (for wine) = 45.6 L.

Metric-linked system after 1861

				Metric
soma				100 L
10	mina			10 L
100	10	pinta		1 L
1000	100	10	coppo	100 mL

Metric system after 1880

							Metric
chilolitro							1000 L
10	ettolitro						100 L
100	10	decalitro					10 L
1000	100	10	litro				1 L
10,000	1000	100	10	decilitro			100 mL
100,000	10,000	1000	100	10	centilitro		10 mL
1,000,000	100,000	10,000	1000	100	10	millilitro	1 mL

Various dry commodities:

1 **ettolitro** (for wheat) = 76 kg;

1 **ettolitro** (for rye) = 70 kg;

1 **ettolitro** (for Turkish wheat) = 66 kg;

1 **ettolitro** (for barley) = 64 kg;

1 **ettolitro** (for oats) = 45 kg.

37.7 Units of Weight

Before 1861

							Metric
cantaro							46.05–59.7 kg
6	rubbo						7.67–9.95 kg
150	25	libbra					307–398 g
1800	300	12	oncia				25.6–33.2 g
14,400	2400	96	8	ottavo			3.2–4.1 g
43,200	7200	288	24	3	denaro		1.1–1.4 g
1,036,800	172,800	6912	576	72	24	grano	44.4–57.6 mg

Metric-linked system after 1861

						Metric
nuova libbra						1 kg
10	oncia					100 g
100	10	grosso				10 g
1000	100	10	denar			1 g
10,000	1000	100	10	grano		100 mg

Upper scale of metric system after 1880

							Metric
tonnellata							1000 kg
10	quintale						100 kg
100	10	miriagrammo					10 kg
1000	100	10	chilogrammo				1 kg
10,000	1000	100	10	ettogrammo			100 g
100,000	10,000	1000	100	10	decagrammo		10 g
1,000,000	100,000	10,000	1000	100	10	grammo	1 g

Lower scale of metric system after 1880

				Metric
grammo				1 g
10	decigrammo			100 mg
100	10	centigrammo		10 mg
1000	100	10	milligrammo	1 mg

37.8 Abruzzo (L’Aquila as the Capital)

After 1840, the weights and measures became the same as in Naples.

37.8.1 Units of Length

At L’Aquila before 1840

		Metric
barile or barila		2.109 m
8	palma	263.625 mm

At L’Aquila after 1840

		Metric
barile or barila		2.645 m
10	palma	264.50 mm

At L’Aquila; at Scanno and Villalago; at Vittorito

							Metric	Metric	Metric
salma							7415.64 m ²	4080 m ²	14,628 m ²
3	tomolo						2471.88 m ²	1360 m ²	4876 m ²
6	2	mazzetto					1235.94 m ²	680 m ²	2438 m ²
12	4	2	coppa				617.97 m ²	340 m ²	1219 m ²
600	200	100	50	destro quadro			12.359 4 m ²	6.8 m ²	24.38 m ²
1 666⅔	555⅔	277⅔	138⅔	2⅔	canna quadra		4.449 408 m ²	—	—
106,666⅔	35,555⅔	17,777⅔	8 888⅔	177⅔	64	palmo quadro	6.952 2 dm ²	—	—

37.8.2 Units of Area

1 **opera** (at Pratola Peligna) = 2510 m²;
1 **opera** (at Bugnara and Pettorano sul Gizio) = 2422 m².

In the Province of Chieti

					Metric
salma					9730.83 m ²
3	tomolo or moggio				3243.61 m ²
6	2	mezzetto			1621.80 m ²
12	4	2	coppa		810.90 m ²
72	24	12	6	misura	135.15 m ²

At Pescara

					Metric
salma					9729 m ²
3	tomolo				3243 m ²
12	4	coppa			810.75 m ²
72	24	6	misura		135.125 m ²
1152	384	96	16	canna	8.445 m ²

37.8.3 Units of Dry Capacity

After 1840

							Metric
carro							1999.624 068 L
36	tomolo						55.545 113 L
72	2	mezzetta					27.772 556 L
144	4	2	quarta				13.886 278 L
288	8	4	2	stopello			6.943 139 L
864	24	12	6	3	misura		2.314 380 L
3456	96	48	24	12	4	quartarola	578.595 mL

37.8.4 Units of Liquid Capacity

For wine at L'Aquila before 1840 and after 1840

		Metric	Metric
canna or cana		38.573 L	43.6 L
60	caraffa	642.883 mL	726.7 mL

For wine in the Province of Chieti

		Metric
barile		38.573 040 L
60	caraffa	642.884 mL

For oil in the Province of Chieti

		Metric	Metric
metro or cannata		21.60 kg	21.072 700 L
30	foglietta	720 g	702.423 mL

Other reported measures:

1 **cannata** or **metro** (for oil at L'Aquila before 1840) = 21.072 7 L.

1 **staio** (for oil in the Province of Chieti) = 10.081 100 L.

37.9 Aeolian Islands

37.9.1 Units of Length

See *Palermo*.

37.9.2 Units of Area

At Lipari, based on [MART3]

					Metric
salma ^a					30,054.200 m ²
1¼	salma				24,043.360 m ²
20	16	tomolo			1502.710 m ²
500	400	25	pergola		60.108 4 m ²
450,000	360,000	22,500	900	palmo quadro	6.678 7 dm ²

^aFor woods

37.9.3 Units of Liquid Capacity

Oil was usually sold by weight.

For wine at Lipari, based on [MART3]

				Metric
salma				116.053 200 L
9	barile			51.579 200 L
36	4	quartara		12.894 800 L
540	60	15	quartuccio	859.653 mL

For oil at Lipari, based on [MART3]

		Metric	Metric
cantaro		85.965 265 L	79.342 000 kg
100	rotolo	859.653 mL	793.420 g

37.9.4 Units of Weight

See *Palermo*.

37.10 Aosta Valley (Aosta as the Capital)

37.10.1 Units of Length

				Metric
toise or tessa				1.872 m
6	pied			312 mm
72	12	pouce		26 mm
864	144	12	ligne	2.167 mm

Other reported measures:

1 **aune** (for fabrica) = 827 mm.

37.10.2 Units of Area

			Metric
seteur			2803.507 2 m ²
8	quartanée		350.438 4 m ²
800	100	toise carrée	3.504 384 m ²

37.10.3 Units of Volume

Some reported measures:

- 1 **toise cube** (for walls and timber) = 6.560 207 m³;
- 1 **toise cube de Piémont** (for straw and hay) = 5.041 357 m³;
- 1 **toise** (for firewood) = 4.373 471 m³;
- 1 **sac** (for charcoal) = 455.0 dm³;
- 1 **setier** (for lime) = 61 dm³;
- 1 **pied cube** = 30.371 dm³.

37.10.4 Units of Dry Capacity

For grain

				Metric
sac				134.4 L
6	rasa or émine ^a			22.4 L
12	2	quartaine		11.2 L
72	12	6	éminal	1.866 667 L

^a1 **émina** or **colma** (for chestnuts, walnuts, and almonds) = 28.97 L

37.10.5 Units of Liquid Capacity

				Metric
charge				92.50 L
2	baril			46.25 L
50	25	pot or quarteron		1.85 L
100	50	2	bouteille	925.0 mL

37.10.6 Units of Weight

							Metric
cent							38.460 kg
4	rub						9.615 kg
100	25	livre					384.60 g
1200	300	12	once				32.05 g
9600	2400	96	8	octave			4.006 2 g
28,800	7200	288	24	3	denier		1.335 4 g
691,200	172,800	6912	576	72	24	grain	56.4 mg

For medical use

						Metric
libbra						307.44 g
18	uncia					17.08 g
108	6	dramma				2.847 g
324	18	3	scrupulo			948.9 mg
6480	360	60	20	grano		47.44 mg

37.11 Apulia (Bari as the Capital)

37.11.1 Units of Length

For land at Bari before 1840 and after 1840

		Metric	Metric
passo ^a		1.582 020 m	1.587 m
6	palmo	263.67 mm	264.5 mm

^aAlso reported as $7\frac{1}{2}$ palmi = 1.977 527 m

37.11.2 Units of Area

In the Province of Bari

			Metric
tomolo			3128.484 m ²
1	aratro ^a		3128.484 m ²
800	800	passo quadro ($7\frac{1}{2}$ palmi \times $7\frac{1}{2}$ palmi)	3.910 6 m ²
1250	1250	–	passo quadro (6 palmi \times 6 palmi) 2.502 8 m ²

^aIn concept, equal to any piece of land worked by one plough in a day

In Barletta

		Metric
versura		12,263.680 8 m ²
3600	passo quadro (7 \times 7 palmi)	3.406 578 m ²

In the Province of Brindisi, Lecce and Taranto

				Metric	Metric	Metric
tomolo				8516.430 m ²	6298 m ²	6813 m ²
2	quartullo			4258.215 m ²	3149 m ²	3406.5 m ²
8	4	stoppello		1064.554 m ²	787.25 m ²	851.62 m ²
2500	1250	312½	passo quadro	3.406 573 m ²	–	–

In the Province of Foggia

					Metric
versura					12,263.660 m ²
4	tomola				3065.915 m ²
3600	900	passo quadro			3.406 57 m ²
176,400	44,100	49	palmo quadro		6.952 dm ²
352,800	88,200	98	2	passitello	3.476 dm ²

In Gallipoli

		Metric
moggio or tomolata		4004.460 m ²
57,600	palmo quadro	6.952 2 dm ²

At Lecce, based on [MART3]

			Metric
Vignale			6256.970 0 m ²
2500	passo quadro		2.502 8 m ²
90,000	36	palmo quadro	6.952 2 dm ²

At Lecce, based on [MART3]

			Metric
tomolate			4087.890 m ²
1200	passo quadro		3.406 6 m ²
58,800	49	palmo quadro	6.952 2 dm ²

Other reported measures:

- 1 **vignale** (for vineyards in the Province of Bari) = 7392 m²;
- 1 **vigna** (for vineyards in the Province of Bari) = 4374 m²;
- 1 **aratro** (for vineyards in the Province of Bari) = 3149 m²;
- 1 **rasole** (at Canosa di Puglia) = 514 m².

37.11.3 Units of Volume

		Metric
canna		1.173 184 m ³
64	palmo cubo	1.833 1 dm ³

37.11.4 Units of Liquid Capacity

For wine at Bari

			Metric
salma			214.294 6 L
–	salma		150.706 1 L
240	228	caraffa	660.992 mL

For oil at Bari (usually sold by weight)

			Metric	Metric
salma ^a			185.361 300 L	169.289 5 kg
–	salma ^b		165.849 584 L	151.469 5 kg
9	8 ¹ / ₁₀	staio ^c	20.595 700 L	18.809 9 kg

^a=190 rotoli

^b=170 rotoli

^c=21¹/₉ rotoli

For wine in Barletta

			Metric
soma da mosto ^a			197.936 848 L
–	soma da vino ^b		163.006 816 L
272	224	caraffa ^c	727.709 mL

^aFor concentrated wine. In the city, it was also sold as 281 caraffe legali (after 1840) = 204.310 604 L

^bFore wine. In the city, it was also sold as 240 caraffe legali (after 1840) = 174.500 160 L

^c1 **cadaffe legale** (after 1840) = 727.084 mL

In the Province of Brindisi

					Metric
soma					154.292 160 L
4	barile grande				38.573 040 L
10	2½	barile piccolo			15.429 216 L
240	60	24	caraffa		642.884 mL
480	120	48	2	misura	321.442 mL

For oil and cleared oil in the Province of Brindisi

			Metric	Metric
salma			170.727 700 L	165.849 800 L
10	staio		17.072 770 L	16.584 980 L
320	32	pignatella	533.524 mL	518.281 mL

For wine in the Province of Foggia

		Metric
barile		30.001 240 L
40	caraffa	750.031 mL

For oil in the Province of Foggia

		Metric	Metric
staio		10.406 300 L	9.504 kg
10⅔	rotolo	975.591 mL	891.00 g

For wine in Gallipoli

					Metric
soma					174.114 480 L
4	barile grande				43.522 862 L
10	2½	barile piccolo			17.411 448 L
240	60	24	caraffa		725.477 mL
480	120	48	2	misura	362.738 mL

For oil in Gallipoli

		Metric	Metric
salma		165½ rotoli = 147.312 kg	161.297 100 L
16	staio	10⅓ rotoli = 9.207 kg	10.081 069 L

For wine at Lecce, based on [MART3]

						Metric
soma						154.292 100 L
4	barile grande					35.573 025 L
10	2½	barile piccolo				15.429 210 L
15	3¾	1½	mezza			10.286 140 L
240	60	24	16	caraffa		642.884 mL
480	120	48	32	2	misura	321.442 mL

For clear oil at Lecce, based on [MART3]

			Metric	Metric
salma ^a			170.727 700 L	175 rotoli = 155.925 kg
10	staio		17.072 770 L	17½ rotoli = 15.592 kg
320	32	pignatella	533.524 mL	546.875 g

^aFor unclear oil, 1 **salma** = 182 rotoli = 162.161 kg = 177.556 800 L

Other reported measures:

- 1 **barile** or **barila** (for wine and oil at Bari after 1840) = 43.6 L;
- 1 **staio** (for oil in Barletta) = 10.406 300 L (= 10⅔ rotoli = 9.504 kg);
- 1 **pignatta**, pignatolo or pignatto (for oil at Bari) = 517 mL.
- 1 **botte di mezzo migliaio** (for oil during the fourteenth century) = 57 saine of Constantinople = of unknown size.

37.11.5 Units of Weight

Naples scale

					Metric
cantaro					89.099 720 kg
2%	cantaro piccolo				32.075 900 kg
100	36	rotolo			890.997 g
277¾	100	2%	libbra		320.758 999 g
3333	1200	33⅓	12	oncia	26.729 916 g

Naples scale for medical use

						Metric
libbra						320.758 999 g
12	oncia					26.729 916 g
120	10	dramma				2.672 992 g
360	30	3	scrupolo			891.00 mg
720	60	6	2	obolo		445.50 mg
7200	600	60	20	10	acino	44.55 mg

Other reported measures:

- 1 **rotolo grosso** (in Barletta) = 849.556 g.

37.12 Basilicata (Potenza as the Capital)

37.12.1 Units of Length

In Potenza before 1840

		Metric
canna		2.109 6 m
8	palmo	263.7 mm

In Potenza after 1840

		Metric
canna		2.645 m
10	palmo	264.5 mm

37.12.2 Units of Area

In Potenza and at Matera

							Metric
carro							245,273.616 0 m ²
20	versura						12,263.680 8 m ²
60	3	tomolo ^a					4087.893 6 m ²
120	6	2	mezzetto				2043.946 8 m ²
240	12	4	2	quarto			1021.973 4 m ²
480	24	8	4	2	stoppello		510.986 7 m ²
1440	72	24	12	6	3	misura	170.328 9 m ²

^aAt Matera, also reported as 4115.22 m² for general use

37.12.3 Units of Volume

1 **quintale** or **canna** (for firewood, 4¼ m 1.06 m 9/10 m) = 4 m³.

37.12.4 Units of Dry Capacity

1 **tomolo** (for olives at Pisticci) = 64 L;

1 **tomolo** (for olives at Tricarico) = 56.56 L;

1 **tomolo** (for olives at Craco, Garagusa and Rotondella) = 56 L;

1 **tomolo** (for oiles at Genzano di Lucania) = 55.55 L;

1 **tomolo** (for olives at Palazzo San Gervasio) = 55 L;

1 **tomolo** (for olives at Aliano) = 40 L;

1 **tomolo** (for oiles at Nova Siri) = 28 L.

37.12.5 Units of Liquid Capacity

1 **quintale** (for oil at Barile) = 110–112 L;

1 **barile** (for wine at Pietragalla) = 35 L;

1 **staio** (for oil at Melfi and Venosa) = 20 L;

1 **mezza pesa** (for oil at Forenza) = 10 L;

1 **pignatta** (for oil at Forenza) = 6.75 L;

1 **quartarola** (for oil at Lucania and Palazzo San Gervasio) = 5 L;

1 **pignata** (for oil) = 3.06 L.

For wine in Potenza before and after 1840

		Metric	Metric
barile		35.715 760 L	43.6 L
40	pinta	892.894 mL	1.09 L

For wine at Genzano di Lucania, Matera, Melfi and Palazzo San Gervasio

		Metric	Metric	Metric	Metric
soma		265 L	175 L	165 L	272 L
24	quartarole	11.04 L	7.3 L	6.9 L	11.3 L

For oil in Potenza before 1840

		Metric	Metric
staio		19.511 700 L	17.820 kg
20	rotolo	975.585 mL	891.0 g

Metric-linked system for oil after 1840

		Metric
pesa		20 L
2	quartara	10 L

37.12.6 Units of Weight

1 **soma di mulo** or **soma di cavallo** (load of a mule or load of a horse) = 130–150 kg;

1 **soma di asino** (load of a donkey) = 50–100 kg;

1 **pesa** (for oil at Aliano) = 18 kg.

For oil

		Metric
cantaro		89.099 7 kg
100	rotolo	890.997 g

37.13 Calabria (Catanzaro as the Capital)**37.13.1 Units of Length**

In Catanzaro before 1840

		Metric
canna, cana, canda, chana, or channa		2.109 360 m
8	palmu, pallmu, palma, palmu, or palmu	263.670 mm

In Catanzaro after 1840

		Metric
canna, cana, canda, chana, or channa		2.645 m
10	palmu, pallmu, palma, palmu, or palmu	264.50 mm

37.13.2 Units of Area

At Catanzaro before 1840

			Metric
moggio			3925.668 197 m ²
–	tomolata or tomolo		3364.858 455 m ²
1050	900	passo quadro ($7\frac{1}{3} \times 7\frac{1}{3}$ palmi)	3.738 732 m ²

In the Province of Cosenza before 1840

					Metric
tomolata, moggio, or vigna					4004.465 m ²
2	mezzetto				2002.232 5 m ²
4	2	quarto			1001.116 25 m ²
8	4	2	stoppello		500.558 125 m ²
32	16	8	4	cozzo	125.139 531 m ²

At Reggio Calabria before 1840

						Metric
tomolate						9130.185 m ²
2	mezzarolata					4565.093 m ²
4	2	stuppellata				2282.546 m ²
8	4	2	quartaronata			1141.273 m ²
2052	1026	513	$256\frac{1}{2}$	passo quadro		4.449 408 m ²
131,328	65,664	32,832	16,416	64	palmu quadro	6.952 2 dm ²

37.13.3 Units of Dry Capacity

In Catanzaro before 1840

			Metric
tomolo ^a			64.538 717 L
2	mezzaruola, meçarola, meçarolla, mezarola, mezaruola, mezerola, mezzaralo, mezzarola, or mezzarolo		32.269 358 L
28	14	misura	2.304 954 L

^a1 tomolo di Napoli (according to [MART3], also used in Catanzaro) = 24 misure = 55.318 900 L

In the Province of Cosenza before 1840

					Metric
tomolo ^a					64.538 717 L
2	mezzarola				32.269 358 L
4	2	quarto			16.134 679 L
8	4	2	stoppello		8.067 340 L
28	14	7	3½	misura	2.304 954 L

^a1 tomolo di Napoli (according to [MART3], also used in Cosenza) = 24 misure = 55.318 900 L

37.13.4 Units of Liquid Capacity

For wine in Catanzaro before 1840

			Metric
salma			107.147 300 L
2	barile, barila, barilla, barillo, barilo, or barrile		53.573 650 L
120	60	caraffa	892.894 mL

For wine in the province of Cosenza before 1840

		Metric
barile		28.286 900 L
22	cannata	1.285 768 L

For oil in Catanzaro before 1840

			Metric	Metric
botte, bocte, bota, bote, or botta			405.107 kg	443.566 900 L
44	staio		9.207 kg	10.081 066 L
454⅔	10⅓	rotolo	891 g	–

For wine and oil in Catanzaro after 1840

			Metric
botte			523.20 L
12	barile		43.60 L
720	60	caraffa	726.67 mL

For wine at Reggio Calabria before 1840

		Metric
salma		107.147 300 L
100	quartuccio	1.071 473 L

Other reported measures:

1 cafiso (for oil at Reggio Calabria) = 15.804 500 L.

37.13.5 Units of Weight

Before 1840

							Metric
cantaro							89.099 720 kg
2%	cantaro piccolo						32.075 899 2 kg
100	36	rotolo					890.997 200 g
277%	100	2%	libbra				320.758 992 g
3 333⅓	1200	33⅓	12	uncia			26.729 916 g
100,000	36,000	1000	360	30	trappeso		890.997 mg
2,000,000	720,000	20,000	7200	600	20	acino	44.550 mg

After 1840

						Metric
cantaro						89.099 720 kg
100	rotolo					890.997 200 g
1000	10	decimo				89.099 720 g
10,000	100	10	centesimo			8.909 972 g
100,000	1000	100	10	trappeso		890.997 2 mg

Other reported measures before 1840:

- 1 **litra** (for oil in the province of Cosenza) = 2.566 kg.
- 1814, the area was incorporated into the Italian Republic and the Kingdom of Napoleon. In 1815, it was returned to the papacy.

37.14 Campania (Naples as the Capital)

37.15.1 Currency

–1808: 1 Modena lire = 20 soldi = 240 denari

See *Naples* and *Two Sicilies*.

37.15 Emilia-Romagna (Bologna as the Capital)

A northern division of Italy that came under control of the papacy in 755. Between 1796 and

37.15.2 Units of Length

In Bologna

							Metric
miglio							1900.491 5 m
500	pertica						3.800 983 m
1000	2	passo					1.900 491 m
3000	6	3	braccio mercantile				633.497 mm
5000	10	5	1⅔	piede agrimensorio			380.098 mm
60,000	120	60	20	12	uncia liprandia		31.675 mm
720,000	1440	720	240	144	12	punto	2.639 mm
8,640,000	17,280	8640	2880	1728	144	12	atomo 219.96 µm

In Bobbio

				Metric
piède				471.954 mm
12	oncia			39.329 5 mm
144	12	punto		3.277 5 mm
1728	144	12	atomo	273.1 µm

In Cento

				Metric
pie				396.452 mm
12	oncia			33.038 mm
144	12	punto		2.753 mm

In Cesena

				Metric
pie				538.473 mm
10	oncia			53.847 3 mm

In Ferrara

					Metric
pertica					4.038 544 m
10	pie				403.854 mm
120	12	oncia			33.654 mm
1440	144	12	punto		2.805 mm
17,280	1728	144	12	atomo	234 µm

In Reggio Emilia

							Metric
miglio							1592.694 m
500	pertica						3.185 389 m
1000	2	passo					1592.694 m
3000	6	3	braccio agrimensorio				530.898 mm
36,000	72	36	12	oncia			44.241 mm
432,000	864	432	144	12	punto		3.687 mm
5,184,000	10,368	5184	1728	144	12	atomo	307 µm

In Forlì

				Metric
pertica				4.882 060 m
10	pie			488.206 mm
100	10	oncia		48.820 6 mm

In Imola

				Metric
pertica				4.396 610 m
10	pie agrimensorio			439.661 mm
100	10	oncia		43.966 mm
1000	100	10	punto	4.397 mm

Old scale in Reggio Emilia

			Metric
pie			530.898 1 mm
12	once		44.241 mm

At Modena

			Metric
cavezzo			3.138 3 m
6	pie		523.05 mm
72	12	pollice	43.588 mm

At Modena

							Metric
miglio							1569.144 870 m
500	pertica						3.138 289 74 m
1250	2½	passo					1.255 316 m
3000	6	2⅔	piede				523.048 mm
36,000	72	28⅔	12	uncia			43.587 mm
432,000	864	345⅔	144	12	punto		3.632 mm
5,184,000	10,368	4 147⅔	1728	144	12	atomo	302.7 µm

At Parma

							Metric
miglio							1635.500 000 m
500	pertica						3.271 000 m
3000	6	piede or braccio					545.167 mm
36,000	72	12	uncia				45.431 mm
432,000	864	144	12	punto			3.786 mm
5,184,000	10,368	1728	144	12	atomo		315 µm

At Piacenza

							Metric
canna							5.634 780 m
2	trabucco						2.817 390 m
12	6	piede or braccio					469.565 mm
144	72	12	uncia				39.130 mm
1728	864	144	12	punto			3.261 mm
20,736	10,368	1728	144	12	atomo		272 µm

Other reported measures during the nineteenth century:

- 1 **miglio** (at Piacenza) = 1,481.608 296 m;
- 1 **braccio da tela** (for cloth in Cesena) = 702.356 mm;
- 1 **braccio** (in Bobbio) = 677.0 mm;
- 1 **braccio da seta** (for silk at Piacenza) = 675.000 mm;
- 1 **braccio** (for canvas, cotton and wool in Ferrare) = 673.607 mm;
- 1 **braccio mercantile** (at Reggio Emilia) = 641.072 mm;
- 1 **braccio da panno** (for cloth at Parma) = 639.500 mm;

- 1 **braccio mercantile** (in Imola) = 639.35 mm;
- 1 **braccio mercantile** (in Cento) = 637.629 mm;
- 1 **braccio da seta** (for silk in Ferrare) = 634.358 mm;
- 1 **braccio da tela** (for cloth in Modena) = 633.153 mm;
- 1 **braccio da lana** (for wool in Cesena) = 619.725 mm;
- 1 **braccio da seta** (for silk in Bologna) = 595 mm;
- 1 **braccio da seta** (for silk at Parma) = 587.750 mm;
- 1 **braccio da tela** (for linen in Bologna) = 519 mm;
- 1 **piede** (in Ferrare) = 403.854 mm.

37.15.3 Units of Area

In Bobbio

			Metric
pertica pavese			769.791 84 m ²
24	tavole		32.074 66 m ²
96	4	trabucco quadro	8.0186 65 m ²

In Bologna

					Metric
biolca					2759.466 9 m ²
1 ^{47/144}	tornatura^a				2080.435 8 m ²
191	144	tavola			14.447 472 m ²
19,100	14,400	100	piede quadro		14.447 472 dm ²
267,400	201,600	1400	14	oncia	1.031 962 dm ²

^aA tornatura represented, in concept, the area that a pair of oxen can work in a day

In Bologne based on [DOUR]

				Metric
biolca				2831.730 m ²
1 ^{2/3}	tornatura			2022.664 m ²
196	140	pertica quadra		14.447 601 m ²
19,600	14,000	100	piede quadro	14.447 601 dm ²

In Cento

			Metric
tornatura			2263.308 312 m ²
144	tavole		15.717 419 m ²
14,400	100	piede quadro	15.717 419 dm ²

In Cesena and Imola

			Metric	Metric
tornatura			2899.531 717 m ²	1933.016 1 m ²
100	tavole		28.995 317 m ²	19.330 161 m ²
10,000	100	piede quadro	28.995 317 dm ²	19.330 161 dm ²

In Forlì

			Metric
tornatura			2383.450 5 m ²
100	pertica quadra		23.834 505 m ²
10,000	100	piede quadro	23.834 505 dm ²

In Modena

				Metric
biolca				2836.472 4 m ²
72	tavola			39.395 450 m ²
288	4	cavezzo or pertica		9.848 862 m ²
10,368	144	36	piede quadro	27.357 9 dm ²

In Ferrara, based on [DOUR] and [MART3]

				Metric	Metric
biolca				6523.92 m ²	6523.936 0 m ²
6	staio			–	1087.322 7 m ²
400	66 $\frac{2}{3}$	tavola or pertica quadra		16.309 805 33 m ²	16.309 840 m ²
40,000	6 666 $\frac{2}{3}$	100	piede quadro	16.309 805 33 dm ²	16.309 840 dm ²

In Forlì

		Metric
tornatura		2383 m ²
100	pertica quadra	23.83 m ²

At Parma, based on [DOUR]

							Metric
biolca							3047.44 m ²
6	staro						507.907 m ²
72	12	tavola					42.326 m ²
288	48	4	pertica quadra				10.581 394 m ²
10,368	1728	144	36	braccio quadro			29.392 762 dm ²
1,492,992	248,832	20,736	5184	144	once quadro		20.411 64 cm ²
214,990,848	35,831,808	2,985,984	746,496	20,736	144	punti quadro	14.17 mm ²

At Parma, based on [MART3]

								Metric
biolca								3081.439 0 m ²
6	staio							513.573 2 m ²
72	12	tavola						42.797 8 m ²
288	48	4	pertica quadra					10.699 441 m ²
864	144	12	3	piede				3.566 480 m ²
10,368	1728	144	36	12	braccio quadro or oncia			29.720 7 dm ²
124,416	20,736	1728	432	144	12	punto		2.476 7 dm ²
1,492,992	248,832	20,736	5184	1728	144	12	atomo	20.64 cm ²

At Piacenza

				Metric
pertica				762.018 6 m ²
24	tavola agraria			31.750 775 m ²
96	4	trabucco quadro		7.937 694 m ²
3456	144	36	braccio quadro	22.049 1 dm ²

At Piacenza

					Metric
tavola agraria					31.750 775 m ²
12	braccio agrario				2.645 898 m ²
144	12	oncia			22.049 1 dm ²
1728	144	12	punto		1.837 4 dm ²
20,736	1728	144	12	atomo	15.31 cm ²

In Reggio Emilia

						Metric
biolca						2922.262 272 m ²
72	tavola or pertica quadra					40.586 976 m ²
10,368	144	braccio quadro				28.185 4 dm ²
1,492,992	20,736	144	oncia quadro			19.573 cm ²
214,990,848	2,985,984	20,736	144	punto quadro		13.59 mm ²
30,958,682,112	429,981,696	2,985,984	20,736	144	atomo quadro	0.094 2 mm ²

Other reported measures:

1 **miglio quadrato** (in Reggio Emilia) = 868
biolce and 4 tavole = 2395 277.75 m².

37.15.4 Units of Volume

For walls in Bobbio

		Metric
trabucco		3.784 441 m ³
6	piede cubo	630.739 dm ³

For timber in Bologna

			Metric
passetto			6.864 324 m ³
—	carro		5.930 776 m ³
125	108	piede cubo	54.915 dm ³

In Cesena

		Metric
piede cubo		156.131 954 dm ³
1000	once cube	156.131 954 cm ³

In Ferrara

		Metric
passetto		8.233 500 m ³
125	piede cubo	65.868 dm ³

For timber in Modena

			Metric
pertica cuba			30.908 533 m ³
6	carro di legna		3.863 567 m ³
216	36	piede cubo	14.309 5 dm ³

At Parma

							Metric
carro^a							11.665 956 m ³
2½	passo						4.860 815 m ³
72	30	quadretto^b					162.027 dm ³
864	360	12	oncia				13.502 dm ³
10,368	4320	144	12	punto			1.125 dm ³
124,416	51,840	1728	144	12	atomo		94 cm ³
1,492,992	622,080	20,736	1728	144	12	minuto	8 cm ³

^aFor hay, also said to equal about 656 kg

^bFor hay, timber, straw, firewood, etc

For timber at Piacenza

						Metric
pilotto						22.363 589 m ³
216	quadretto					103.535 dm ³
2592	12	oncia				8.628 dm ³
31,104	144	12	punto			719 cm ³
373,248	1728	144	12	atomo		60 cm ³

In Reggio Emilia

		Metric
braccio cubo		149.635 m ³
1728	oncia cuba	87 cm ³

Other measures reported during the nineteenth century:

- 1 **carro** (for hay in Reggio Emilia) = 84 quadretti = 12.575 m³;
- 1 **carro** (for firewood in Reggio Emilia) = 27 quadretti = 4.042 m³;
- 1 **bacchetta** (for firewood in Bobbio) = 1.892 221 m³;

- 1 **piede di schiappa** (in Imola) = 212.467 dm³;
- 1 **piede cubo** (in Imola) = 84.987 m³;
- 1 **piede cubo** (in Cento) = 62.312 dm³;
- 1 **tavola** (for timber in Bobbio) = 62.295 dm³;

37.15.5 Units of Dry Capacity

In Bobbio

			Metric
staio			37.280 L
2	emina		18.640 L
14	7	coppello	2.662 9 L

In Bologna

						Metric
carro						1572.896 L
10	sacco					157.289 60 L
20	2	corba				78.644 80 L
40	4	2	staio			39.322 40 L
320	32	16	8	quartirolo		4.915 30 L
2560	256	128	64	8	quarticino or cupo	614.412 5 mL

In Cento

				Metric
corba				77.143 300 L
2	staio			38.571 650 L
16	8	quartirolo		4.821 456 L
128	64	8	coppirolo	602.682 mL

In Cesena

						Metric
sacco						207.265 950 L
1½	staio					138.177 300 L
3	2	starolo				69.088 650 L
6	4	2	quartarola			34.544 325 L
30	20	10	5	bernarda		6.908 865 L
480	320	160	80	16	scodella	431.804 1 mL

In Ferrare, based on [DOUR]

				Metric
moggio				625.88 L
20	staio			31.294 L
80	4	quarta		7.823 L
160	8	2	quartino	3.912 L

In Ferrare, based on [MART3]

						Metric
moggio						621.858 400 L
5	sacco					124.371 680 L
20	4	staio				31.092 920 L
80	16	4	quarta			7.773 230 L
320	64	16	4	minello		1.943 307 L
1280	256	64	16	4	scodella	485.827 mL

In Forlì

						Metric
sacco						144.324 400 L
2	staio					72.162 200 L
4	2	mezzino				36.081 100 L
8	4	2	quarto			18.040 550 L
32	16	8	4	provenda		4.510 137 L
128	64	32	16	4	scodella	1.127 534 L

In Imola

					Metric
sacco					137.737 200 L
2	corba				68.868 600 L
4	2	staio			34.434 300 L
32	16	8	quartiroli		4.304 288 L
256	128	64	8	scodella	538.036 mL

In Modena

					Metric
sacco					126.500 400 L
2	staio				63.250 200 L
4	2	mina			31.625 100 L
16	8	4	quarta		7.906 275 L
96	48	24	6	coppello	1.317 712 L

At Parma, based on [DOUR]

			Metric
staio or staro			51.42 L
2	mina		25.71 L
16	8	quartarolo	3.213 L

At Parma before 1816 and after 1816, based on [MART3]

				Metric	Metric
staio				47.040 000 L	45.450 000 L
2	mina			23.520 000 L	22.725 000 L
16	8	quartarola		2.940 000 L	2.840 625 L
64	32	4	quartino	735.000 mL	710.156 mL

For lime at Parma

		Metric
staio		49.940 000 L
4	quartaro	12.235 000 L

For coal at Parma

		Metric
staio		48.880 000 L
16	quartaro	3.055 000 L

At Piacenza

					Metric
staio					34.820 000 L
2	mina				17.410 000 L
15	7½	coppello			2.321 333 L
30	15	2	mezzo		1.160 667 L
60	30	4	2	quarto	580.333 mL

For cereals in Reggio Emilia

				Metric
sacco				119.491 100 L
2	staio			59.745 550 L
24	12	quartarola		4.978 796 L
240	120	10	decimo	497.880 mL

For grain, gravel and sand in Reggio Emilia

			Metric
sacco			1194.92 L
2	staio		597.46 L
4	2	mina	298.73 L

Other measures reported during the nineteenth century:

- 1 corba (for fruits in Bologna) = 3 staia = 73.79 L;
- 1 bozzola da mugnaio (in Imola) = 2.837 100 L.

For wine in Cesena

				Metric
carro				791.338 800 L
12	soma			65.944 900 L
24	2	barile		32.972 450 L
648	54	27	boccale	1.221 201 8 L

37.15.6 Units of Liquid Capacity

In Bobbio

						Metric
brenta						68.688 L
6	staio					45.792 L
24	4	emina				22.896 L
48	8	2	sesto			11.448 L
288	48	12	6	pinta		1.908 L
576	96	24	12	2	boccale	954 mL

In Ferrare

			Metric
mastello			55.38 L
8	secco		6.922 L
40	5	boccale	1.384 L

For wine and oil in Bologna

					Metric	Metric
castellata					785.931 L	737.92 L
10	corba or mezza corba				78.593 1 L	73.792 L
40	4	quartarolo or quarterola			19.648 275 L	18.448 L
600	60	15	boccale		1.309 885 L	1.230 L
2400	240	60	4	foglietta	327.471 mL	307.47 mL

For wine in Cento

			Metric
corba			90.560 900 L
48	boccale		1.886 685 L
192	4	foglietta	471.671 mL

For oil in Cento

				Metric
libbra				392.570 mL
2	libbra metà			196.285 mL
4	2	quarto		98.142 mL
8	4	2	ottavo	49.071 mL

In Ferrara, based on [MART3]

					Metric
mastello					56.784 200 L
4	secchia				14.196 050 L
40	10	boccale			1.419 605 L
160	40	4	foglietta		354.901 mL
640	160	16	4	quarto	88.734 mL

For wine in Forlì

						Metric
carro						1422.554 000 L
2	baroccio					711.277 000 L
20	10	soma				71.127 700 L
40	20	2	barile			35.563 850 L
840	420	42	21	boccale		1.693 517 L
3360	1680	168	84	4	foglietta	423.379 mL

For must in Imola

				Metric
castellata				847.901 000 L
10	corba			84.790 100 L
600	60	boccale		1.413 168 L

For wine in Imola

				Metric
corba da vino				74.675 800 L
60	boccale			1.244 597 L
180	3	terzetto		414.865 mL
240	4	1⅓	foglietta	311,149 mL

For oil in Imola

				Metric
libbra da olio				396.130 mL
2	metà			198.065 mL
3	1½	terzi		132.043 mL
4	2	1⅓	quarti	99.032 mL

In Modena

								Metric
castellata^a								721.681 900 L
7	quartaro							101.811 700 L
14	2	mastello or soglio						50.905 850 L
15¾	2¼	1⅞	barile					45.821 073 L
84	12	6	5⅓	parolo				8.484 306 L
315	30	22½	20	3¾	pinta			2.262 482 L
630	60	45	40	7½	2	boccale		1.131 241 L
2520	360	180	160	30	8	4	foglietta	282.810 mL

^aFor grape juice

For oil in Modena

		Metric
coppo		96.326 L
2 $\frac{2}{5}$	barile	40.136 L

At Parma

				Metric
brenta				71.672 000 L
36	pinte			1.990 889 L
72	2	boccale		995.444 mL
144	4	2	mezzo	497.722 mL

For milk at Parma

				Metric
secchia				21.331 200 L
8	bariletto			2.666 400 L
64	8	pozzola		333.300 mL
128	16	2	mezzo	166.650 mL

At Piacenza

					Metric
veggiola					757.712 000 L
10	brenta				75.771 200 L
480	48	pinta			1.578 567 L
960	96	2	boccale		789.282 mL
1920	192	4	2	mezzo	394.462 mL

In Reggio Emilia

					Metric
brenta					75.898 100 L
60	pinte				1.264 968 L
120	2	boccale			632.484 mL
480	8	4	foglietta		158.121 mL
600	10	5	1 $\frac{1}{4}$	decimo	126.497 mL

In Reggio Emilia

			Metric
soglio			59.063 300 L
3	brocchetto		19.687 767 L
30	10	decimo	1.968 777 L

Other measures reported during the nineteenth century:

- 1 **brenta** (in Parma) = 72 L;
- 1 **libbra** (for oil in Ferrara) = 377.076 mL;
- 1 **libbra** (for oil in Forlì) = 359.970 mL.

37.15.7 Units of Weight

In Bobbio

								Metric
cantaro								47.512 50 kg
6	rubbo							7.918 75 kg
100	16 $\frac{2}{5}$	rotolo						475.125 g
150	25	1 $\frac{1}{2}$	libbra ^a					316.750 g
1800	300	18	12	oncia				26.395 8 g
14,400	2400	144	96	8	ottavo			3.299 5 g
43,200	7200	432	288	24	3	denaro		1.099 8 g
1,036,800	172,800	10,368	6912	576	72	24	grano	458.3 mg

^aAlso for medical use

In Bologna

							Metric
peso							9.046 275 kg
25	libbra mercantile						361.851 g
300	12	oncia					30.154 25 g
2400	96	8	ottavo				3.769 281 g
4800	192	16	2	ferlino			1.884 640 g
48,000	1920	160	20	10	carato		188.464 mg
192,000	7680	640	80	40	4	grano	47.116 mg

In Cento

			Metric
libbra			359.321 g
12	oncia		29.943 g
48	4	quarta	7.486 g

In Cesena

			Metric
libbra			329.724 g
12	oncia		27.477 g
96	8	ottava	3.434 625 g

In Ferrara

								Metric
centinaio								34.513 730
100	libbra							345.137 g
1200	12	oncia						28.761 g
4800	48	4	quarta					7.190 g
9600	96	8	2	ottava				3.595 g
19,200	192	16	4	2	ferlino			1.797 g
192,000	1920	160	40	20	10	carato		180 mg
768,000	7680	640	160	80	40	4	grano	45 mg

In Forlì and Imola

			Metric	Metric
libbra			329.441 g	362.583 g
12	oncia		27.453 g	30.216 g
96	8	ottava	3.432 g	3.777 g

In Modena

							Metric
carro^a							851.141 700 kg
25	quintale						34.045 668 kg
100	4	peso					8.511 417 kg
2500	100	25	libbra				340.457 g
30,000	1200	48	12	oncia			28.371 g
480,000	19,200	768	192	16	ferlino		1.773 g
4,800,000	192,000	7680	1920	160	10	carato	177.4 mg

^aFor hay

For wine in Modena

						Metric
quartaro						102.137 004 kg
2	mastello					51.068 502 kg
12	6	parolo				8.511 417 kg
30	22½	3¾	pinta			2.269 711 kg
60	45	7½	2	boccale		1.134 856 kg
360	180	30	8	4	foglietta	283.714 g

At Parma

						Metric
quintale						32.800 000 kg
4	peso					8.200 000 kg
100	25	libbra				328.000 g
1200	300	12	oncia			27.333 g
28,800	7200	288	24	denaro		1.139 g
691,200	172,800	6912	576	24	grano	47 mg

At Piacenza

		Metric
rubbio		7.95 kg
25	libbra	318 g

At Piacenza

						Metric
quintale						31.751 710 kg
4	peso					7.937 927 kg
100	25	libbra				317.517 g
1200	300	12	oncia			26.460 g
28,800	7200	288	24	denaro		1.103 g
691,200	172,800	6912	576	24	grano	46 mg

In Reggio Emilia

				Metric
libbra				324.524 g
12	oncia			27.044 g
288	24	denaro		1.127 g
6912	576	24	grano	47 mg

For medical use in Bologna, Cento and Imola

					Metric
libbra medicinale					325.665 450 g
12	oncia				27.138 787 5 g
96	8	dramma			3.392 348 4 g
288	24	3	scrupolo		1.130 782 8 g
6912	576	72	24	grano	47.116 mg

For medical use in Cesena; in Ferrara; in Modena and Reggio Emilia; in Parma and at Piacenza

					Metric	Metric	Metric	Metric
libbra					325.670 000 g	345.137 g	340.456 680 g	328.000 000 g
12	oncia				27.139 167 g	28.761 g	28.371 390 g	27.333 333 g
96	8	dramma			3.392 396 g	3.595 g	3.546 424 g	3.416 667 g
288	24	3	scrupolo		1.130 799 g	1.198 g	1.182 141 g	1.138 889 g
6912	576	72	24	grano	47.117 mg	50 mg	49.256 mg	47.454 mg

For jewels in Cesena

		Metric
libbra		238.747 g
8	oncia	29.843 4 g

For gold and silver in Cesena

		Metric
libbra		339.344 g
12	oncia	28.278 7 g

For gold and silver in Ferrara

				Metric
libbra				339.1 g
12	once			28.26 g
288	24	denaro		1.177 g
6912	576	24	grano	49.06 mg

For gold, silver, diamonds and silk in Bologna and Modena

						Metric
libbra						361.850 500 g
12	oncia					30.154 212 g
96	8	ottava				3.769 281 g
192	16	2	ferlino			1.884 640 g
1920	160	20	10	carato		188.464 mg
7680	640	80	40	4	grano	47.116 mg

For gold and silver in Parma

				Metric
libbra				326.4 g
12	once			27.2 g
288	24	denaro		1.13 g
6912	576	24	grano	47.2 mg

37.16 Friuli-Venezia Giulia (Trieste as the Capital)

37.16.1 Units of Length

In Udine

						Metric
miglio						1702.452 m
833⅓	pertica or passo grande					2.042 942 m
1000	1⅓	passo				1.702 452 m
5000	6	5	piede			340.490 4 mm
60,000	72	60	12	oncia		28.374 2 mm
720,000	864	720	144	12	linea	2.364 5 mm

Other reported measures:

1 **braccio da panno** (for cloth in Udine) =
680.981 mm;

1 **braccio da seta** (for silk in Udine) =
636.252 mm.

For oil in Udine

		Metric	Metric
orna		47.699 870 kg	65.300 L
4	miro	11.924 967 kg	16.325 L

37.16.2 Units of Area

In Udine

				Metric
zuoia grande				5217.017 062 m ²
–	zuoia piccola			3,505.835 466 m ²
1250	840	tavola or pertica quadra		4.173 614 m ²
45,000	30,240	36	piede quadro	11.593 371 dm ²

37.16.3 Units of Volume

In Udine

		Metric
passo cubo		4.934 289 m ³
125	piede cubo	39.474 316 dm ³

37.16.4 Units of Dry Capacity

In Udine

				Metric
staio				73.159 100 L
2	quarta			36.579 550 L
6	3	pesinale		12.193 183 L
24	12	4	quarto	3.048 296 L

37.16.5 Units of Liquid Capacity

For wine in Udine

			Metric
conzo			79.304 500 L
4	secchia		19.826 125 L
64	16	boccale	1.239 133 L

eimer Trieste (also as **orna**) = 40 boccali =
about 56.60 L.

eimer Trieste (also as **baril**) = 36 boccali =
about 65.66 L;

boccale [Ital: *pl.* boccali], **boccalo**, **bocal**, or
bocale Trieste = 1/36 orna = about 1824 L or
later 1/40 orna = about 1.415 L,

37.16.6 Units of Weight

1 **eimer** Trieste (for oil; also as **orna**) = 5½
caffisi = 60 kg

37.17 Lazio (Rome as the Capital)

37.17.1 Units of Length

Upper scale for architectual use in Rome

				Metric
catena architetonico				11.172 m
5	canna			2.234 m
16⅔	3⅓	braccio or passo architetonico		670.32 mm
600	120	36	oncia	18.62 mm

Lower scale for architectual use in Rome

							Metric
piede							297.896 mm
$1\frac{1}{3}$	palm						223.422 mm
16	12	uncia					18.618 mm
80	60	5	minuto				3.724 mm
160	120	10	2	decimo			1.861 8 mm
1600	1200	100	20	10	centesimo		186.18 μ m
16,000	12,000	1000	200	100	10	millesima	18.618 μ m

For agricultural use in Rome

						Metric
miglio romano						1489.478 813 m
$115\frac{65}{69}$	catena agrimensoria					12.846 755 m
1000	$8\frac{3}{8}$		passo agrimensoria			1.489 479 m
$1\ 159\frac{29}{69}$	10		$1\frac{11}{69}$	staiolo		1.284 675 m
80,000	690		80	69	uncia	18.618 mm

Other reported measures:

1 **braccio mercantile** = 848.187 mm;

1 **braccio** or **passetto** = 670.265 mm;

1 **braccio da tessitore** (used for weaving) = 636.140 mm.

37.17.2 Units of Area

During the Middle Ages, based on [KIDS, p. 58]

						Metric
rubbio						18,848 m ²
4	quarta					4621 m ²
7	$1\frac{3}{4}$	pezzo				2640.6 m ²
16	4	$2\frac{3}{7}$	scorzo			1155 m ²
64	16	$9\frac{1}{7}$	4	quartuccio		288.8 m ²

Upper scale in Rome before 1816

										Metric
rubbio										18,484.380 1 m ²
2	soma									9242.190 0 m ²
4	2	quarta								4621.095 0 m ²
7	$3\frac{1}{2}$	$1\frac{3}{4}$	pezza							2640.625 7 m ²
16	8	4	$2\frac{3}{7}$	scorzo						1155.273 8 m ²
28	14	7	4	$1\frac{3}{4}$	quarta (della Pezza)					660.156 4 m ²
64	32	16	$9\frac{1}{7}$	4	$2\frac{3}{7}$	quartuccio				288.818 4 m ²
1120	560	280	160	70	40	$17\frac{1}{2}$	catena			165.039 106 m ²
11,200	5600	2800	1600	700	400	175	10	ordine		16.503 911 m ²
112,000	56,000	28,000	16,000	7000	4000	1750	100	10	staiolo quadro	1.650 391 m ²

Lower scale in Rome before 1816

						Metric
canna quadra						4.991 730 m ²
2¼	passo quadro					2.218 547 m ²
56¼	25	piede romano quadro				8.874 2 dm ²
100	44%	1%	palmo romano quadro			4.991 7 dm ²
14,400	6400	256	144	oncia quadra		3.47 cm ²
360,000	160,000	6400	3600	25	minuto	1.4 mm ²

In Rome after 1816

						Metric
quadrato						10,000 m ²
10	tavola					1000 m ²
10,000	1000	canna quadra				1 m ²
1,000,000	100,000	100	palmo quadro			1 dm ²
100,000,000	10,000,000	10,000	100	oncia quadra		1 cm ²
10,000,000,000	1,000,000,000	1,000,000	10,000	100	minute quadro	1 mm ²

In Frosinone

						Metric
rubbio						18,484 m ²
2	soma					9242 m ²
4	2	quarta				4621 m ²
12	6	3	coppa			1540.3 m ²
48	24	12	4	quartuccio		385.1 m ²

37.17.3 Units of Volume

					Metric
canna cuba					11.152 616 m ³
1000	palmo cubo				11.153 dm ³
1,728,000	1728	oncia cuba			6.454 cm ³
216,000,000	216,000	125	minute		51.6 mm ³

Some other reported measures:

1 **passo** (for firewood) = 2.595 752 m³;1 **soliva** (for firewood) = 102.832 dm³.

37.17.4 Units of Dry Capacity

For wheat and dry commodities in general (...legale) in Rome

								Metric
rubbio								294.465 011 L
2	rubbiatella							147.232 505 L
4	2	quarta						73.616 253 L
8	4	2	quartarolo					36.808 126 L
12	6	3	1½	staio				24.538 751 L
16	8	4	2	1⅓	starello or coppa			18.404 063 L
22	11	5½	2¾	1%	1⅞	scorzo		13.384 773 L
88	44	22	11	7⅓	5½	4	quartuccio	3.346 193 L

For oats and fodder (. . .d’avena) in Rome

					Metric
rubbio					249.458 065 L
2	rubbiatella				124.729 032 L
4	2	quarta			62.364 516 L
24	6	3	staio		20.788 172 L
128	64	32	10 $\frac{2}{3}$	quarterona	1.948 891 L

For salt (. . .da sale) in Rome

					Metric
rubbio					164.598 300 L
2	rubbiatella				82.299 150 L
4	2	quarta			41.149 575 L
12	6	3	scorzo		13.716 525 L
48	24	12	4	quartuccio	3.429 131 L

Other reported measures:

- 1 **balle** (for charcoal) = 501.868 000 L;
- 1 **sacco** (for charcoal) = 278.815 000 L;
- 1 **soma** (for lime) = 135.628 740 kg;
- 1 **soma** (for hay) = 101.721 555 kg.

37.17.5 Units of Liquid Capacity

For oil in Civitavecchia

			Metric
boccale			2.260 L
4	foglietta		565 mL
16	4	quartuccie	141.25 mL

For oil in Gaeta during the fifteenth century

			Metric
botte			unknown equivalent
13 $\frac{3}{4}$	orcio of Florence		unknown equivalent
160	11 $\frac{7}{11}$	caffiso	unknown equivalent

For oil (. . . “da olio”) in Rome

							Metric
soma							164.230 461 L
2	mastello or pelle ^a						82.115 230 L
2 $\frac{2}{7}$	1 $\frac{1}{7}$	barile					57.480 661 L
20	10	7	cognatella				8.211 523 L
80	40	28	4	boccale or pinta			2.052 881 L
320	160	112	16	4	foglietta		513.220 mL
1280	640	448	64	16	4	quartuccio	128.305 mL

^aExpected to weigh 440 libra = about 149 kg

For wine (... “da vino” or “legale”) in Rome

							Metric
botte							933.465 454 L
8	soma						116.683 182 L
16	2	barile					58.341 591 L
32	4	2	quartarola				29.170 795 L
512	64	32	16	boccale or pinta			1.823 175 L
2048	256	128	64	4	foglietta		455.794 mL
8192	1024	512	256	16	4	quartuccio	113.948 mL

37.17.6 Units of Weight

In Civitavecchia

		Metric
cantaro		35.263 472 kg
104	libbra	339.071 85 g

In Rome

				Metric
migliaio or quintale grosso				339.071 850 kg
10	quintale sottile			33.910 718 5 kg
100	10	decine		3.391 071 85 kg
1000	100	10	libbra	339.071 85 g

For gold and silver in Rome

					Metric
libbra					339.071 850 g
12	uncia				28.255 987 g
96	8	ottava			3.531 998 g
488	24	3	denaro		1.177 333 g
6912	576	72	24	grano	49.055 mg

For medical use in Rome

						Metric
libbra						339.071 850 g
12	uncia					28.255 987 g
96	8	dramma				3.531 998 g
488	24	3	scrupolo			1.177 333 g
6912	576	72	24	grano		49.055 mg
165,888	13,824	1728	576	24	ventiquat-tresimo	2.044 mg

37.18 Liguria (Genoa as the Capital)

Genoa was a dominant republic in the Middle Ages. In 1798, Napoleon remodeled it into the Ligurian Republic, and in 1805, it was incorporated into the Kingdom of Napoleon. In 1815, it became part of the Kingdom of Sardinia.

37.18.1 Currency

1798–1805: 1 Madonnina lira = 5 cavallotti = 10 parpagliola = 20 soldi = 240 denari

In Genoa:

1746–1827: 1 lira = 20 soldi = 240 denari

1637–1746: 1 lira

37.18.2 Units of Length

Metric-linked system at Albenga

				Metric
canna ^a				4.5 m
1½	canna			3 m
18	12	palmo		250 mm
216	144	12	oncia	20.83 mm

^aFor canvas

Old scale in Genoa

			Metric
miglio genovese			1488.499 8 m
500	cannella		2.976 999 6 m
6000	12	palmo	248.083 3 mm

New upper scale in Genoa

							Metric
miglio							1488.500 m
500	cannella						2.977 000 m
600	1½	canna					2.480 833 m
666⅔	1⅓	1⅘	canna di bambagia				2.232 750 m
1000	2	1⅔	1½	passo			1.488 500 m
2000	4	3⅓	3	2	goa ^a		744.250 mm
72,000	144	120	108	72	36	oncia	20.673 mm

^aFor maritime use

New lower scale in Genoa

						Metric
braccio						578.76 mm
2⅓	palmo					248.083 mm
28	12	oncia				20.673 mm
336	144	12	linea			1.723 mm
4032	1728	144	12	punto		143.6 μm
48,384	20,736	1728	144	12	atomo	71.8 μm

For use at sea in Genoa

		Metric
lega marittima		5556.031 111 m
3	miglio marittimo	1852.010 370 m

At Imperia and Oneglia

					Metric
canna					2.988 000 m
12	palmo				249.000 mm
144	12	oncia			20.750 mm
1728	144	12	linea		1.729 mm
20,736	1728	144	12	punto	144 µm

At Sanremo

				Metric
cannella				3.360 000 m
12	palmo			280.000 mm
144	12	oncia		23.333 mm

Metric-linked system at Savona

				Metric
canella				3 m
3	misura			1 m
12	4	palmo		250 mm
144	48	12	oncia	2.083 3 mm

Other reported measures:

- 1 **canna** (for fabrics in Genoa) = 10 palmi = 2.480 833 m;
- 1 **canna** (for fabrics of cotton in Genoa) = 9 palmi = 2.232 750 m;
- 1 **canna** (for fabrics of cotton at Sanremo) = 8 palmi = 1.995 000 m;
- 1 **piede** (for naval constructions) = 324.839 mm.

37.18.3 Units of Area

Metric-linked system at Albenga and Savona

				Metric
canna quadra				9 m ²
16	goa			56.25 dm ²
144	9	palmo quadro		6.25 dm ²

At Genoa

				Metric
cannella quadra				8.862 529 m ²
12	palmo superficiale			73.854 4 dm ²
144	12	palmo cuadro		6.154 53 dm ²
20,736	1728	144	oncia quadro	4.274 cm ²

At Imperia and Oneglia

				Metric
canna quadra				8.928 144 m ²
144	palmo quadro			6.200 1 dm ²
20,736	144	oncia quadra		4.306 cm ²
2,985,984	20,736	144	linea quadra	2.99 mm ²

At Sanremo

				Metric
cannella quadra				11.289 600 m ²
144	palmo quadro			7.840 dm ²
20,736	144	oncia quadra		5.44 cm ²

Other reported measures:

- 1 **minata** = 1406.25 m².

37.18.4 Units of Volume

Metric-linked system for timber at Albenga and Savona

				Metric
canna cuba				27 m ³
6	canella di volume			4.5 m ³
1728	288	palmo cubo		62.5 dm ³

At Genoa

				Metric
canella cuba				26.383 749 m ³
6	canella da muro ^a			4.397 291 m ³
1728	288	palmo cubo		15.268 dm ³
2,985,984	497,664	1728	oncia cubo	8.86 cm ³

^aFor masonry

For lime in Genoa

			Metric
moggio da calce			1.465 764 m ³
6	soma		244.294 dm ³
96	16	palmo cubo	15.268 dm ³

At Imperia and Oneglia

			Metric
cannella			4.446 216 m ³
288	palmo cubo		15.438 dm ³
497,664	1728	oncia cuba	8.93 cm ³

For bricks at Sanremo

				Metric
cannella di volume				3.556 224 m ³
81	palmo di volume			43.904 dm ³
162	2	palmo cubo		21.952 dm ³
279,936	3456	1728	oncia cuba	12.7 cm ³

For timber at Sanremo

			Metric
cannella di volume			148.176 dm ³
81	palmo		1.829 dm ³
11,664	144	oncia cuba	12.7 cm ³

37.18.5 Units of Dry Capacity

For coal in Genoa

		Metric
sacco		157.750 000 L
3	misura or coppo	52.583 333 L

For corn in Genoa

			Metric
mina			116.531 806 L
4	staio		29.132 952 L
8	2	quarta	14.566 476 L
96	24	12	gombetta 1.213 873 L

For other cereals in Genoa

				Metric
mina or émine				120.70 L
2	quartino			60.35 L
4	2	staro or staio		30.17 L
8	4	2	quarta	15.087 L

For cereals at Albenga

					Metric
emina					128 L
3½	quartara^a				40 L
4	1¼	staro			32 L
16	5	4	quarta		8 L
64	20	16	4	motularo	2 L

^a1 quartara (for olives) = 18 motulari = 36 L

Metric-linked system at Imperia and Oneglia

					Metric
mina					120 L
3	staio				40 L
6	2	minetta			20 L
12	4	2	quarta		10 L
60	20	10	5	coppello or motularo	2 L

Metric-linked system for olives at Oneglia

					Metric
gombetta					198 L
3	staio				66 L
12	4	quarta			16.5 L
48	16	4	motularo		4.125 L

For cereals at Sanremo

					Metric
emina					121.776 000 L
2	sacco				60.888 000 L
4	2	staio			30.444 000 L
8	4	2	bogliola		15.222 000 L
48	24	12	6	coppello	2.537 000 L

For olives at Sanremo

				Metric
corbino				63.425 000 L
2½ ₂₅	bogliola			30.444 000 L
25	12	coppello		2.537 000 L

Other reported measures:

1 **quarta** (for loives and chestnuts) = 22.000 L.

37.18.6 Units of Liquid Capacity

For wine at Albenga

		Metric
barile di vino		40 L
40	amole	1 L

For oil at Albenga

		Metric
barile di olio		65.479 68 L
120	quarterone	545.664 mL

For wine in Chiavari

				Metric
mezzarola				159.360 L
3	terzarolo			53.120 L
4	1½	quartarolo		39.840 L
160	53⅓	40	amola	996.0 mL

For oil in Chiavari

			Metric
barile			64.797 600 L
126⅔	quarterone		511.560 mL
760	6	misuretta	85.260 mL

Metric-linked system for wine and brandy in Genoa

							Metric	Metric
caratello							318.000 000 L	297.000 000 L
2	mezzarola ^a						159.000 000 L	148.500 000 L
4	2	barile					79.500 000 L	74.250 000 L
6	3	1½	terzarola				53.000 000 L	50.000 000 L
8	6	2	1⅓	quartarolo			39.750 000 L	37.125 000 L
360	180	90	60	45	amola		883.333 mL	825.000 mL
1440	720	360	240	180	4	quarto	208.333 mL	206.250 mL

^aAlso reported, for wine, as equal to 20 rubbi = 158.832 kg

For oil in Genoa

				Metric	Metric
barile da olio				2304 once = 60.992 kg	65.479 680 L
4	quarto			576 once = 15.248 kg	16.369 920 L
128	32	quarterone		18 once = 476.496 g	511.560 mL
768	192	6	misuretta	3 once = 79.416 g	85.260 mL

Metric-linked system at Imperia

				Metric
salmata				80 L
2	barile ^a			40 L
10	5	rubbo		20 L
80	40	8	amola	1 L

^aReported as 59.390 625 kg

Metric-linked system at Oneglia

				Metric	Metric
salmata				96 L	95.025 kg
2	barile			48 L	47.512 kg
4	2	mezzo barile		24 L	23.756 kg
96	48	24	pinta or amola	1 L	989.8 g

Metric-linked system for wine at Savona

			Metric
mezzarola			160 L
4	barile		40 L
160	40	amola	1 L

For wine at Sanremo

			Metric
barile			36 L
4	rubbo		9 L
32	8	amola	1.125 L

Old scale, based on [MART3]

							Metric
rubbo							7.918 750 kg
16 $\frac{2}{3}$	rotolo						475.125 g
25	1 $\frac{1}{2}$	libbra peso sottile					316.750 g
300	18	12	uncia				26.395 8 g
2400	144	96	8	ottava or dramma			3.299 5 g
7200	432	288	24	3	denaro or scrupolo		1.099 8 g
172,800	10,368	6912	576	72	24	grano	45.8 mg

peso grosso in Genoa

								Metric
pesata^a								238.248 000 kg
1½	botte							158.832 000 kg
5	3⅓	cantaro						47.649 600 kg
30	20	6	rubbo					7.941 600 kg
500	333⅓	100	16⅔	rotolo				476.496 g
750	500	150	25	1½	libbra grosso			317.664 g
9000	6000	1800	300	18	12	uncia		26.472 g
72,000	48,000	14,400	2400	144	96	8	ottavo	3.309 g

^aFor firewood. There was also a peseta equal to 4 cantari = 190.598 400 kg

Other reported measures:

1 **barile** (for oil at Sanremo) = 64.900 L (=59.562 kg);

1 **libbra** (for oil at Sanremo) = 346.000 mL;

1 **rubbio** (for oil in Genoa) = 8.62 L (weighs 25 libbra sottile).

37.18.7 Units of Weight

During the fifteenth century in Pera and Tana (near present-day Azov in Russia, then a colony of Genoa):

1 **soma** (for silver) = unknown value.

peso sottile in Genoa and at Imperia

								Metric
cantaro								47.512 500 kg
6	rubbo							7.918 750 kg
100	16 $\frac{2}{3}$	rotolo						475.125 g
150	25	1 $\frac{1}{2}$	libbra sottile					316.750 g
1800	300	18	12	oncia				26.396 g
14,400	2400	144	96	8	ottava			3.299 g
43,200	7200	432	288	24	3	denaro		1.100 g
1,036,800	172,800	10,368	6912	576	72	24	grano	46 mg

For silk in Genoa

				Metric
libbra sottile				316.750 g
12	oncia			26.396 g
48	4	quarto		6.599 g
192	16	4	sediceno	1.650 g

For gold, silver and jewels in Genoa

								Metric
libbra sottile								316.750 000 g
12	oncia							26.395 833 g
48	4	quarta						6.598 958 g
96	8	2	ottavo or dramma					3.299 479 g
288	24	6	3	denaro				1.099 826 g
576	48	12	6	2	obolo			549.913 mg
1728	144	36	18	6	3	carato		183.304 mg
6912	576	144	72	24	12	4	grano	45.826 mg

For medical use in Genoa

								Metric
libbra								316.750 000 g
12	oncia							26.395 833 g
96	8	ottavo or dramma						3.299 479 g
288	24	3	scrupolo					1.099 826 g
576	48	6	2	obolo				549.913 g
1728	144	18	6	3	siliqua			183.304 g
6912	576	72	24	12	4	grano		45.826 mg

Other reported measures:

1 **barile** (for oil at Odessa) = 7 $\frac{1}{2}$ rubbi = 59.390 625 kg.

37.19 Lombardy (Milan as the Capital)

See also *Lombardy-Venetia*.

After the fall of Napoleon in 1814, the duchies of Mantua and Milan and the Venetian Republic were incorporated into the Habsburg monarchy

as the Kingdom of Lombardy-Venetia. Lombardy came under the Kingdom of Italy in 1859, and Venetia became a part of Italy in 1866.

37.19.1 Currency

1862–1866: 1 Lombardy-Venetia florin = 100 soldi
1816–1862: 1 Lombardy-Venetia scudo = 100 centesimi

1814–1816: 1 Napoleonic Italian lira = 100 centesimi
1802–1814: 1 French franc = 100 centimes
1797–1802: 1 Cisalpinian lira
1796–1797: 1 Cispadanian lira
1778–1796: 1 Milanese scudo = 6 lire = 120 soldi = 1440 denari
1163–1778: 1 lira imperial = 20 soldi = 240 denari
774–1162: 1 lira = 20 soldi = 240 denari

37.19.2 Units of Length

In Bergamo and Brescia

					Metric	Metric
cavezzo or pertica					2.626 603 m	2.852 803 m
6	piede				437.767 2 mm	475.467 2 mm
72	12	oncia			36.480 6 mm	39.622 3 mm
864	144	12	punto		3.040 mm	3.302 mm
10,368	1728	144	12	atomo	253.3 μm	275.2 μm

In Chiavenna

					Metric
staggio					3.163 182 m
3	passo				1.054 394 m
6	2		piede		527.197 mm
72	24		12	oncia	43.933 mm

In Como, Crema and Cremona

					Metric	Metric	Metric
trabucco					2.707 314 m	2.818 718 m	2.901 233 m
6	piede				451.219 mm	469.786 mm	483.539 mm
72	12	oncia			37.602 mm	39.149 mm	40.295 mm
864	144	12	punto		3.133 mm	3.262 mm	3.358 mm
10,368	1728	144	12	atomo	261.1 μm	271.9 μm	279.8 μm

In Lodi

					Metric
trabucco or cavezzo					2.731 995 m
6	piede				455.332 mm
72	12	oncia			37.944 mm
864	144	12	punto		3.162 mm
10,368	1728	144	12	atomo	263 μm

In Mantua before 1869

				Metric
perticone				5.602 319 m
2	cavezzo			2.801 159 m
12	6	pie		466.860 mm
144	72	12	oncia	38.905 mm

Traditional (. . . “trabucco”) scale for land in Milan between 1773 and 1803

							Metric
miglio							1650.221 497 248 m
316	gettata						5.222 219 928 m
632	2	trabucco or cavezzo					2.611 109 964 m
3792	12	6	pie				435.184 994 mm
45,504	144	72	12	oncia			36.265 416 mm
546,048	1728	864	144	12	punto		3.022 118 mm
6,552,576	20,736	10,368	1728	144	12	atomo	251.843 µm

In Mortara

						Metric
trabucco						2.772 300 m
6	pie					462.383 mm
72	12	oncia				38.449 mm
864	144	12	punto			3.204 mm
10,368	1728	144	12	atomo		267 µm

Metric-linked system in Milan after 1803

								Metric
lega metrica								10,000 m
10	miglio							1000 m
1000	100	decametro						10 m
4000	400	4	trabucco					2.5 m
10,000	1000	10	2½	braccio				1 m
100,000	10,000	100	25	10	palm			1 dm
1,000,000	100,000	1000	250	100	10	dito or oncia		1 cm
10,000,000	1,000,000	10,000	2500	1000	100	10	atomo	1 mm

In Pavia

							Metric
gettata							5.663 448 m
2	trabucco pavese						2.831 724 m
9	4½	braccio pavese					629.272 mm
12	6	1⅓	pie pavese				471.954 mm
144	72	16	12	oncia			39.329 mm
1728	864	192	144	12	punto		3.277 mm
20,736	10,368	2304	1728	144	12	atomo	273.1 mm

In Como, Cremona, Lodi, Milan and Pavia

				Metric
braccio milanese				594.936 448 mm
12	oncia			49.578 037 mm
144	12	punto		4.131 503 mm
1728	144	12	atomo	344.292 μ m

In Como, Cremona, Lodi, Milan and Pavia

						Metric
braccio mercantile						594.936 448 mm
2	metà					297.468 224 mm
3	1½	terzi				198.121 493 mm
4	2	1⅓	quarti			148.591 120 mm
8	4	1½	2	ottavi		74.295 560 mm
12	6	4	3	1½	sedicesimi	49.530 373 mm

Other reported measures:

- 1 **miglio Lombardo** (in Milan) = 3000 braccia = 1784.809 344 m;
 1 **trabucco piemontese** (in Mortara) = 3.086 420 m;
 1 **braccio da panno** (for cloth in Brescia) = 674.124 mm;
 1 **braccio da panno** (for cloth in Chiavenna) = 670.853 mm;
 1 **braccio mercantile** (in Crema) = 670.164 mm;
 1 **braccio da panno** (for cloth in Mortara) = 668.787 mm;
 1 **braccio** (in Lodi) = 667.697 mm;
 1 **braccio mercantile** (in Bergamo) = 659.319 mm;

- 1 **braccio da seta** or **braccio da tela** (for silk and canvas in Brescia) = 640.383 mm;
 1 **braccio mercantile** (in Mantua) = 637.973 mm;
 1 **braccio da fabbrica** (for fabric in Mortara and Pavia) = 629.272 mm;
 1 **raso di Piemonte** (in Mortara) = 600.137 mm;
 1 **braccio di Vigevano** (in Mortara) = 599.070 mm;
 1 **braccio da fabbrica** (for fabric in Bergamo) = 531.414 mm;
 1 **braccio da seta** (for silk in Mortara) = 528.140 mm;
 1 **braccio da seta** (for silk in Chiavenna) = 526.422 mm.

37.19.3 Units of Area

Traditional system (. . . di Tavola) in Milan before 1803

							Metric
pertica							654.517 944 m ²
24	tavola						27.271 581 m ²
96	4	trabucco quadro					6.817 895 m ²
288	12	3	piede quadro				1.415 798 m ²
3456	144	36	12	once quadro			353.949 dm ²
41,472	1728	432	144	12	punto quadro		189.386 dm ²
497,664	20,736	5184	1728	144	12	atomo quadro	15.782 dm ²

In Bergamo

						Metric
pertica						662.308 200 m ²
24	tavola					27.596 175 m ²
288	12	pie				2.299 681 m ²
3456	144	12	oncia			19.164 dm ²
41,472	1728	144	12	punto		1.597 dm ²
497,664	20,736	1728	144	12	atomo	13.3 cm ²

^aIn Bergamo, also known as **pertica beramasca**

In Brescia

				Metric
piò				3255.393 6 m ²
100	tavola			32.553 936 m ²
400	4	cavezzo		8.138 484 m ²
14,400	144	36	braccio quadro	22.606 9 dm ²

In Chiavenna

					Metric
pertica					667.048 024 m ²
24	tavola				27.793 668 m ²
66 ² / ₃	2 ² / ₃	staggia quadra			10.005 720 m ²
600	25	9	passo quadro		1.111 747 m ²
2400	100	36	4	pie	27.793 668 dm ²

In Como, in Crema, and in Cremona

				Metric	Metric	Metric
pertica				703.636 713 m ²	762.736 4 m ²	808.046 9 m ²
24	tavola			29.318 196 m ²	31.780 683 m ²	33.668 612 m ²
96	4	trabucco quadro		7.329 549 m ²	7.945 171 m ²	8.417 153 m ²
3456	144	36	pie	20.335 986 dm ²	22.069 919 dm ²	23.380 980 dm ²

In Lodi

			Metric
pertica			716.524 3 m ²
24	tavola		29.855 2 m ²
96	4	trabucco quadro	7.463 795 m ²

In Mantua before 1869

				Metric
biolca				3138.569 9 m ²
100	tavola			31.385 699 m ²
400	4	pertica quadra		7.846 492 m ²
14,400	144	36	pie	21.795 8 dm ²

In Mortara

				Metric
pertica pavese				769.791 8 m ²
24	tavola pavese			32.074 6 m ²
96	4	trabucco pavese quadro		8.018 664 m ²
3456	144	36	piede quadro	22.274 1 dm ²

In Mortara and Pavia

					Metric
tavola pavese					32.074 6 m ²
12	piede di Tavola				2.672 9 m ²
144	12	oncia di Tavola			22.274 dm ²
1728	144	12	punto di Tavola		1.856 dm ²
20,736	1728	144	12	atomo di Tavola	15.47 cm ²

For fabric in Mortara

		Metric
quadretto		1.583 934 m ²
4	braccio quadro	39.598 3 dm ²

Metric-linked system in Milan after 1803

			Metric
tornatura			10,000 m ²
100	tavola		100 m ²
10,000	100	metro quadro	1 m ²

For surveying at Pavia

					Metric
manso					110,850.019 2 m ²
12	iugero				9237.501 6 m ²
144	12	pertica pavese			769.791 8 m ²
3456	288	24	tavola pavese or gettata quadra		32.074 658 m ²
13,824	1152	96	4	trabucco pavese quadro	8.018 664 m ²

At Pavia

			Metric
braccio d'asse			1.583 932 m ²
4	braccio pavese quadro		39.598 3 dm ²
7%	1%	piede quadro	22.274 1 dm ²

Other reported measures:

- 1 **braccio da legname** (in Pavia) = 1.415 798 m²;
- 1 **braccio quadro** (in Lodi, Milan and Pavia) = 35.394 9 dm²;
- 1 **braccio da fabbrica quadro** (in Bergamo) = 28.240 1 dm².

37.19.4 Units of Volume

For timber in Crema

		Metric
carro		5.184 073 m ³
20	quadrino	25.920 365 dm ³

In Cremona

		Metric
songa		6.105 030 m ³
54	piede cubo	113.056 119 dm ³

In Mantua before 1869

				Metric
carro ^a				12.210 720 m ³
–	carro ^b			10.175 600 m ³
–	–	passo ^c		4.579 020 m ³
120	100	45	quadretto	101.756 dm ³

^aFor straw

^bFor hay

^cFor wood

In Mortara

				Metric
pignone				23.921 406 m ³
6	misura			3.986 901 m ³
96	16	quadretto		249.181 dm ³

Metric-linked system in Milan after 1803

				Metric
soma				100 dm ³
10	mina			10 dm ³
100	10	pinta		1 dm ³
1000	100	10	coppo	100 cm ³

For timber in Pavia

		Metric
braccio		3.369 238 m ³
16	braccio milanese cube	21.057 7 dm ³

Other reported measures:

- 1 **carro** (for hay in Brescia) = 10.748 839 m³;
1 **meda** (for firewood in Brescia) = 7.739 164 m³;
1 **songa** (for firewood in Lodi) = 5.097 762 m³;
1 **pertica** (for walls in Brescia) = 3.869 582 m³;
1 **carro** (for manure in Brescia) = 1.289 861 m³;
1 **moggio** (for coal in Milan) = 225 dm³;
1 **braccio cubo** (in Como, Lodi and Milan) = 210.577 dm³;
1 **carro** (for firewood in Milan) = 4 4 1 braccio = 16 braccio³;
1 **braccio da fabbrica cubo** (in Brescia) = 107.488 dm³.
1 **braccio da fabbrica cubo** (in Bergamo) = 150.072 dm³;
1 **piede cubo** (in Lodi) = 9.440 3 dm³.

37.19.5 Units of Dry Capacity

In Bergamo

						Metric
carro						1712.812 L
10	soma					171.281 2 L
80	8	staio				21.410 15 L
320	32	4	quartaro			5.352 537 5 L
1280	128	16	4	sedicino		1.338 134 4 L
5120	512	64	16	4	quartino	334.533 6 mL

For cereals in Bergamo

					Metric
carro					1656.70 L
10	soma				165.67 L
80	8	staio			20.709 L
120	12	1½	quarta		13.806 L
480	48	6	4	copelle	3.451 L

In Brescia

					Metric
soma					145.920 L
12	quarta				12.160 L
48	4	coppo			3.040 L
192	16	4	stoppello		760 mL
768	64	16	4	quartino	190 mL

In Chiavenna

						Metric
soma^a						201.072 154 L
1 ³ / ₂₀₀	soma^b					191.932 513 L
1 ¹ / ₁₀	1 ¹ / ₂₀	soma^c				182.792 870 L
11	10½	10	staio			18.279 287 L
44	42	40	4	quartaro		4.569 822 L
176	168	160	16	4	quartina	1.142 455 L

^aFor wheat and rye^bFor wheat^cFor rice

In Como

						Metric
moggio						153.900 000 L
8	staio					19.237 500 L
32	4	quartaro				4.809 375 L
128	16	4	metà			1.202 343 L
512	64	16	4	quartino		300.586 mL

In Crema

						Metric
soma						175.481 100 L
16	staio					10.967 568 L
32	2	emina				5.483 784 L
160	10	5	coppello			1.096 757 L
640	40	20	4	misurino		274.189 mL

In Cremona

					Metric
sacco					106.933 800 L
3	staio				35.644 600 L
6	2	mina			17.822 300 L
12	4	2	quartaro		8.911 150 L
36	12	6	3	coppello	2.970 383 L

In Lodi

						Metric
soma^a						178.826 175 L
1 $\frac{1}{8}$	sacco or moggio					158.956 600 L
9	8	staio				19.869 575 L
36	32	4	quartaro			4.967 393 L
144	128	16	4	metà		1.241 848 L
576	512	64	16	4	quartino	310.462 mL

^aFor oats

In Mantua before 1869

				Metric
sacco				103.815 500 L
3	staio			34.605 167 L
12	4		quarto	8.651 291 L

For cereals in Milan before 1803

										Metric
mina										4094.560 263 L
14	rubbio									292.468 590 L
18 $\frac{2}{3}$	1 $\frac{1}{3}$	soma^a								219.351 443 L
24 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{3}$	carga or soma^b							164.513 582 L
28	2	1 $\frac{1}{2}$	1 $\frac{1}{8}$	moggio^c or sacco						146.234 295 L
224	16	12	9	8	staio					18.279 287 L
448	32	24	18	16	2	starello				9.139 643 L
896	64	48	36	32	4	2	quartaro			4.569 822 L
3584	256	192	144	128	16	8	4	meta		1.142 455 L
14,336	1024	768	576	512	64	32	16	4	quartino	285.614 L

^aUsually for rice. Expected to weigh 250 libra grossa = about 175 kg^bFor oats^cDefined as a 1200 ounce cube

For coal in Milan before 1803

					Metric
moggio					225.103 325 L
8	staio				28.137 916 L
32	4	quartaro			7.034 479 L
128	16	4	metà		1.758 620 L
512	64	16	4	quartino	439.655 mL

In Mortara

					Metric
sacco lomellino or sacco pavese					122.263 300 L
6	emina				20.377 217 L
12	2	quartaro			10.188 608 L
48	8	4	eminella		2.547 152 L
72	12	6	1½	coppo	1.698 101 L

In Pavia

					Metric
sacco pavese					122.263 300 L
6	mina or emina				20.377 217 L
12	2	quartaro			10.188 608 L
48	8	4	minella		2.547 152 L
72	12	6	1½	coppo	1.698 101 L

For corn at Pavia

		Metric
maggiore		183.394 4 L
8	emina colma	22.924 3 L

Other reported measures:

1 **moggio** (for coal in Chiavenna, Lodi and Milan) = 225.103 300 L;

1 **moggio** (for charcoal in Mortara) = 219.300 000 L;

1 **moggio** (for lime in Lodi) = 139.280 000 L;

1 **mina rasa** (for rice and alfalfa at Pavia) = 20.377 L.

37.19.6 Units of Liquid Capacity

In Bergamo

					Metric
brenta					70.690 5 L
6	seccia				11.781 75 L
54	9	pinta			1.309 083 L
108	18	2	boccale		654.541 7 mL
432	72	8	4	zaine or bicchiere	163.635 4 mL

In Brescia

							Metric
carro							596.912 4 L
12	zerla						49.742 7 L
48	4	secchia					12.435 675 L
432	36	9	pinta				1.381 742 L
864	72	18	2	boccale			690.871 mL
1728	144	36	4	2	mezzo or mezzino		345.435 mL
3456	288	72	8	4	2	tazza	172.717 mL

In Chiavenna

			Metric
brenta			109.078 600 L
6	staio		18.179 767 L
96	16	boccale	1.136 235 L

In Como

				Metric
brenta				89.806 200 L
6	staio			14.967 700 L
24	4	quartaro		3.741 925 L
96	16	4	boccale	935.481 mL
384	64	16	4	zaina 233.870 mL

In Crema

				Metric
brenta				43.534 600 L
4	secchia			12.133 650 L
32	8	pinta		1.516 706 L
64	16	2	boccale	758.853 mL
256	64	8	4	zaina 189.588 mL

In Milan before 1803

								Metric
brenta ^a								75.554 385 8 L
3	staio							25.184 795 L
6	2	mina, secchia, or starello						12.592 398 L
12	4	2	quartaro					6.296 199 L
16	5 ¹ / ₃	2 ² / ₃	1 ¹ / ₃	bassa				4.722 149 L
48	16	8	4	3	pinta			1.574 050 L
96	32	16	8	6	2	boccale		787.025 mL
192	64	32	16	12	4		mezzo	393.512 mL
384	128	64	32	24	8	4	2	zaina or bicchiere 196.756 mL

^aDefined as a 620 ounce cube

In Cremona

			Metric
brenta			47.465 500 L
75	boccale		632.873 mL
150	2	mezzo	316.436 mL

In Lodi

				Metric
brenta ^a				82.753 750 L
1 ¹ / ₄	brenta ^b			66.203 000 L
100	80	boccale		827.538 mL
400	320	4	zaina or bicchiere	206.884 mL

^aFor milk

^bFor wine

In Mantua before 1869

				Metric
botte				874.908 800 L
8	soglio			109.363 600 L
16	2	portata		54.681 800 L
960	120	60	boccale	911.363 mL

Metric-linked system in Milan after 1803

				Metric
soma				100 L
10	mina			10 L
100	10	pinta		1 L
1000	100	10	coppo	100 mL

In Mortara

					Metric
brenta pavese					71.442 700 L
3	staio				23.814 240 L
48	16	pinta			1.488 389 L
96	32	2	boccale		744.195 mL
384	128	8	4	saina	186.049 mL

At Pavia

					Metric
brenta					71.442 700 L
6	secchia				11.907 117 L
48	8	pinta			1.488 390 L
96	16	2	boccale		744.195 mL
192	32	4	2	quartino	372.097 mL

In Brescia

						Metric
carro						802.030 750 kg
100	peso or rubbo					8.020 307 kg
2500	25	libbra				320.812 g
30,000	300	12	oncia			26.734 g
480,000	4800	192	16	dramma		1.671 g
1,920,000	19,200	768	64	4	quarto	417.7 mg

In Chiavenna

					Metric
peso					8.437 900 kg
10	libbra grossa				843.790 g
–	–	libbra sottile			310.056 g
300	30	–	oncia (grossa)		28.126 g
–	–	12	–	oncia (sottile)	25.838 g

In Como

								Metric
fascio								79.165 450 kg
10	rubbo or peso							7.916 545 kg
83⅓	8⅓	libbra ^a						949.986 g
100	10	1⅕	libbra grossa					791.655 g
250	25	3	2½	libbra piccola				316.662 g
3000	300	36	30	12	oncia			26.388 5 g
72,000	7200	864	720	288	24	denaro		1.099 5 g
1,728,000	172,800	20,736	17,280	6912	576	24	grano	45.8 mg

^aOnly used for bread

Other reported measures:

1 **rubbio** (for oil in Milan) = 20.83 L (expected to weigh 25 libra grossa).

37.19.7 Units of Weight

In Bergamo

					Metric
rubbio					8.128 221 kg
10	libbra grossa				812.822 1 g
25	2½	libbra piccola^a			325.128 8 g
300	30	12	oncia		27.094 1 g
3600	360	144	12	denaro	2.257 8 g

^aFor drugs, cochineal, indigo, silk and wax

In Crema

										Metric
carro										759.439 333 kg
–	bazzolo									37.971 967 kg
–	–	peso intiero								8.136 842 kg
100	5	–	peso mozzo							7.594 393 kg
–	–	10	–	libbra grossa						813.684 g
–	–	–	10	–	libbra mozza					759.439 g
–	–	–	23 $\frac{1}{3}$	2 $\frac{1}{2}$	2 $\frac{1}{3}$	libbra piccola				325.474 g
–	–	–	280	30	28	12	oncia			27.123 g
–	–	–	6720	720	672	288	24	denaro		1.130 g
–	–	–	161,280	17,280	16,128	6912	576	24	grano	47.1 mg

In Cremona

									Metric
peso									8.356 200 kg
1 $\frac{1}{25}$	peso								7.737 222 kg
27	25	libbra							309.489 g
324	300	12	oncia						25.791 g
7776	7200	288	24	denaro					1.074 6 g
186,624	172,800	6912	576	24	grano				44.8 mg

In Lodi

								Metric
fascio or centinaio								74.838 070 kg
9 $\frac{1}{3}$	rubbo							8.018 375 kg
100	10 $\frac{1}{7}$	libbra grossa						748.381 g
233 $\frac{1}{3}$	25	2 $\frac{1}{3}$	libbra piccola					320.735 g
2800	300	28	12	oncia				26.728 g
67,200	7200	672	288	24	denaro			1.114 g
1,612,800	172,800	16,128	6912	576	24	grano		46 mg

In Mantua

			Metric
peso			7.869 225 kg
25	libbra		314.769 g
300	12	oncia	26.231 g

In Milan before 1803

									Metric
fascio^a									76.251 714 kg
$2\frac{2}{3}$	quintale								32.679 306 kg
$9\frac{1}{3}$	4	rubbo							8.169 826 kg
10	$4\frac{2}{7}$	$1\frac{1}{14}$	peso						7.625 171 kg
100	$42\frac{2}{7}$	$10\frac{2}{7}$	10	libbra grossa					762.517 g
$233\frac{1}{3}$	100	25	$23\frac{1}{3}$	$2\frac{2}{3}$	libbra piccola^b				326.793 g
2800	1200	300	280	28	12	oncia			27.233 g
67,200	28,800	7200	6720	672	288	24	denaro		1.135 g
1,612,800	691,200	172,800	161,280	16,128	6912	576	24	grano	47.28 mg

^aAlso **centinaio**^bAlso **libbra sottile**

Metric-linked system in Milan after 1803

									Metric
tonnellata or tonna									1000 kg
10	quintale								100 kg
100	10	rubbia							10 kg
1000	100	10	libbra metriche^a						1 kg
10,000	1000	100	10	oncia					100 g
100,000	10,000	1000	100	10	grosso				10 g
1,000,000	100,000	10,000	1000	100	10	denaro			1 g
10,000,000	1,000,000	100,000	10,000	1000	100	10	grano		100 mg

^aAlso **libbre nuova**

In Mortara

									Metric
fascio									74.369 170 kg
$9\frac{1}{3}$	rubbo								7.968 125 kg
100	$10\frac{2}{7}$	libbra grossa							743.692 g
$233\frac{1}{3}$	25	$2\frac{2}{3}$	libbra piccola						318.725 g
2800	300	28	12	oncia					26.560 g
67,200	7200	672	288	24	denaro				1.107 g
1,612,800	172,800	16,128	6912	576	24	grano			46 mg
38,707,200	4,147,200	387,072	165,888	13,824	576	24	granotto		2 mg

Upper scale at Pavia

									Metric
moggio grosso									148.738 340 kg
$1\frac{1}{2}$	moggio da carbone^a								95.617 504 kg
2	$1\frac{1}{2}$	moggio piccolo or fascio^b							74.369 170 kg
$18\frac{2}{3}$	12	$9\frac{1}{3}$	rubbo^c						7.968 125 kg
200	$128\frac{2}{3}$	100	$10\frac{2}{7}$	libbra grosso					743.692 g
$466\frac{2}{3}$	300	$233\frac{1}{3}$	25	$2\frac{2}{3}$	libbra piccola				318.725 g

^aFor coal^bFor lime and gypsum^cMainly for fish and meat

Lower scale at Pavia

					Metric
libbra piccola					318.725 g
12	uncia				26.560 g
288	24	denaro			1.106 7 g
6912	96	24	grano		46.11 mg
165,888	13,824	576	24	granotto	1.92 mg

Other reported measures:

1 **libbra da olio** (for oil at Milan) = 871.446 g.

For gold and silver in Brescia, Mantua, Milan, and Pavia

					Metric
marco di zecca					234.997 300 g
8	uncia				29.374 662 g
192	24	denaro			1.223 944 g
4608	576	24	grano		50.998 mg
110,592	13,824	576	24	granotto	2.125 mg

For jewels and diamonds in Milan after 1803

		Metric	Metric
carato		206.085 mg	205.670 mg
4	grano	51.521 mg	51.417 5 mg

For gold in Crema, Cremona and Milan before 1803

			Metric
marco			234.997 3 g
24	carato		9.791 55 g
576	24	particella	407.98 mg

For silver in Crema, Cremona and Milan before 1803

			Metric
marco			234.997 3 g
12	denaro		19.583 1 g
288	24	grano	815.96 mg

For medicinal use in Brescia, Crema, Cremona and Lodi

					Metric	Metric	Metric	Metric
libbra					320.812 000 g	325.474 000 g	309.488 880 g	420.045 000 g
12	uncia				26.734 300 g	27.122 833 g	25.790 640 g	35.003 750 g
96	8	dramma			3.341 800 g	3.390 354 g	3.223 842 g	4.375 469 g
288	24	3	denaro or scrupolo		1.113 900 g	1.130 118 g	1.074 614 g	1.458 490 g
6912	576	72	24	grano	46.4 mg	47.088 mg	44.776 mg	60.770 mg

For medical use in Milan, before 1803, and Pavia

					Metric
libbra					326.793 060 g
12	uncia				27.232 755 g
96	8	dramma			3.404 094 g
288	24	3	denaro or scrupolo		1.134 698 g
6912	576	72	24	grano	47.279 mg

For medical use in Mantua, before 1869, and in Mortara

					Metric	Metric
libbra medica					314.769 000 g	307.399 818 g
12	oncia				26.230 750 g	25.616 652 g
96	8	dramma			3.278 844 g	3.202 081 g
288	24	3	scrupolo		1.092 948 g	1.067 360 g
5760	480	60	20	grano	54.647 mg	53.368 mg

37.20 Marche (Ancona as the Capital)

See also *Papal States*.

37.20.1 Currency

1 scudo = 12 paoli = 20 soldi = 80 bolognini = 100 bajocchi = 240 denari

37.20.2 Units of Length

At Ancona

			Metric
canna			1.992 m
3	braccio		664 mm
8	$2\frac{2}{3}$	palma	249 mm

At Ascoli Piceno

			Metric
canna ^a			2.010 795 m
3	braccio		670.265 mm
9	3	palmo romano	223.422 mm

^a1 **canna architettonica** = 10 palmi romani = 2.234 218 m

At Macerata

				Metric
canna				5.585 545 m
10	pie de			558.554 mm
300	30	oncia		18.618 mm
3000	300	10	minuto	1.862 mm

At Pesaro

				Metric
canna				5.222 029 m
15	pie de			348.135 mm
225	15	oncia		29.011 mm
1125	75	5	minuto	5.802 mm

At Pesaro

						Metric
braccio						630.743 mm
2	met à					315.371 mm
3	$1\frac{1}{2}$	terzi				210.248 mm
4	2	$1\frac{1}{3}$	quarti			157.686 mm
6	3	2	$1\frac{1}{2}$	sesti		105.124 mm
8	4	$2\frac{2}{3}$	2	$1\frac{1}{3}$	ottavi	78.843 mm

Other reported measures:

- 1 **mezza** (for cloth) = 995.949 mm;
 1 **piede da terra** (for surveying at Ascoli Piceno) = 554.831 mm;
 1 **piede da legname** (for timber at Ascoli Piceno) = 297.896 mm.

37.20.3 Units of Area

At Ascoli Piceno

			Metric
rubbio			123.134 90 L
8	quarta		15.391 862 5 L
400	50	canna quadra	307.837 25 mL

At Ancona

				Metric
rubbio				~16,000 m ²
2	sacco			~8000 m ²
8	4	coppa		~2000 m ²
16	8	2	tavola	~1000 m ²
32	16	4	2	provenda ~500 m ²

Metric-linked system at Ascoli Piceno

				Metric
rubbio				16,000 m ²
2	sacco			8000 m ²
8	4	quarta		2000 m ²
16	8	2	tavola	1000 m ²
32	16	4	2	coppa 500 m ²

At Macerata

			Metric
modiolo			3119.830 0 m ²
100	canna quadra		31.198 3 m ²
10,000	100	piede quadro	31.198 3 dm ²

At Pesaro

			Metric
centinaio			2726.958 6 m ²
100	canna quadra		27.269 586 m ²
22,500	225	piede quadra	12.119 8 dm ²

Other reported measures:

- 1 **coppa** (at Macerata) = 2000 m²;
 1 **coppa** (at Matelica) = 1890 m².

37.20.4 Units of Volume

At Macerata

		Metric
canna romana cuba		11.152 616 m ³
1000	palmò romano cubo	11.152 616 dm ³

Some reported measures:

- 1 **passo da legna** (for timber at Ascoli Piceno) = 2.855 069 m³;
 1 **passo da legna** (for timber at Pesaro) = 2.630 000 m³;
 1 **passo da muro** (for walls at Ascoli Piceno) = 1.784 418 m³;
 1 **passo da pietra** (for paving at Ascoli Piceno) = 1.427 534 m³;
 1 **piede cubo** (at Pesaro) = 42.193 dm³.

37.20.5 Units of Dry Capacity

At Ancona

			Metric
rubbio or ruggio			286.10 L
8	coppo or lappe		35.76 L
32	4	probenda	8.94 L

At Ascoli Piceno

			Metric
rubbio			280.648 L
2	sacco		140.324 L
8	4	quarta	35.081 L
32	16	4	probenda or coppo 8.770 25 L

At Macerata

			Metric
rubbio			280.648 000 L
8	coppa		35.081 000 L
32	4	provenda	8.770 250 L

At Pesaro

				Metric
sacco				170.359 000 L
6	toppo			28.393 167 L
12	2	bernarda		14.196 583 L
240	40	20	gomina	709.829 mL

37.20.6 Units of Liquid Capacity

Measure reported during the fifteenth century:

1 **mirro** (for oil at Ancona) = 0.537 5 Florentine oncia.

At Ancona

				Metric
soma				85.917 L
2	barila			42.958 L
48	24	boccale		1.790 L
192	86	4	foglietta	447.48 mL

For wine at Ancona

				Metric
soma				69.984 L
2	barile			35.992 L
48	24	boccale		1.458 L
192	96	4	foglietta	364.5 mL

For oil at Ancona

				Metric
metro				17.496 L
12	boccale			1.458 L
48	4	foglietta		364.5 mL

For wine at Ascoli Piceno

				Metric
soma				73.239 5 L
2	barile			36.619 75 L
54	27	boccale		1.356 29 L
216	108	4	foglietta	339.072 mL

For oil at Ascoli Piceno

				Metric
metro da olio				21.533 100 L
4	caldarolo			5.383 275 L
16	4	boccale		1.345 818 75 L
64	16	4	foglietta ^a	336.454 69 mL

^aIn common usage, the foglietta for oil was set as being equal to that of wine (according to [MART3])

For wine at Macerata

				Metric
soma				81.377 300 L
2	barile			40.688 650 L
40	20	boccale		2.034 432 L
160	80	4	foglietta	508.608 mL

For oil at Macerata

				Metric
metro				17.970 800 L
8	boccale			2.246 350 L
32	4	foglietta		561.587 mL
128	16	4	quartuccia	140.397 mL

Old system for wine at Pesaro

					Metric
soma					69.600 000 L
2	barile				34.800 000 L
48	24	boccale			1.450 000 L
96	48	2	mezzo		725.000 mL
192	96	4	2	foglietta	362.500 mL

New system for wine at Pesaro

					Metric
soma					81.377 200 L
2	barile				40.688 600 L
40	20	boccale			2.034 430 L
80	40	2	mezzo		1.017 215 L
160	80	4	2	foglietta	508.607 mL

For oil at Pesaro

						Metric
soma						77.703 100 L
2	barile					38.851 550 L
12	6	quartarolo				6.475 258 L
24	12	2	mezzo			3.237 629 L
54	27	4½	2¼	boccale		1.438 946 L
216	108	18	9	4	foglietta	359.736 mL

37.20.7 Units of Weight

At Ascoli Piceno

					Metric
libbra grossa da stadera					352.635 g
12	oncia				29.386 25 g
96	8	ottava or dramma			3.673 28 g
288	24	3	denaro or scrupolo		1.224 43 g
6912	576	72	24	grano	51.02 mg

At Ascoli Piceno

					Metric
libbra piccolo da bilancia					339.072 g
12	oncia				28.256 g
96	8	ottava or dramma			3.532 g
288	24	3	denaro or scrupolo		1.177 3 g
6912	576	72	24	grano	49.05 mg

At Peaso

								Metric
migliaio								329.582 500 kg
10	quintale							32.958 250 kg
500	50	libbra grossa						659.165 g
666⅔	66⅔	1⅓	libbra mezzana					494.374 g
1000	100	2	1½	libbra anconitana				329.583 g
12,000	1200	24	18	12	oncia			27.465 g
96,000	9600	192	144	96	8	ottava		3.433 g
288,000	28,800	576	432	288	24	3	denaro	1.144 g
6,912,000	691,200	13,824	10,368	6912	576	72	24	grano 48 mg

For medical use

					Metric
libbra					339.071 850 g
12	oncia				28.255 987 g
96	8	dramma			3.531 998 g
288	24	3	scrupolo		1.177 333 g
6912	576	72	24	grano	49.05 mg

Other reported measures:

- 1 **libra** (at Ancona) = about 350.53 g;
- 1 **denaro** (at Ancona) = about 1.144 g;
- 1 **grano** (at Ancona) = about 48 mg.

37.21 Molise (Campobasso as the Capital)

37.21.1 Units of Length

In Campobasso

						Metric
miglio						1845.690 m
1000	passo					1.845 690 m
7000	7	palmo				263.670 mm
28,000	28	4	quarto			65.917 5 mm
84,000	84	12	3	oncia		21.972 5 mm
420,000	420	60	15	5	minuto	4.394 5 mm

37.21.2 Units of Area

In Campobasso

				Metric
tomolo				2336.71 m ²
2	mezzetto			1168.355 m ²
4	2	quarto		584.177 5 m ²
16	8	4	misura	146.044 375 m ²

37.21.3 Units of Dry Capacity

In Campobasso

		Metric
tomolo		55.318 900 L
16	misura	3.457 431 L

37.21.4 Units of Liquid Capacity

For wine in Campobasso

		Metric
barile		40.626 700 L
45½	caraffa	892.894 mL

For oil^a in Campobasso

		Metric	Metric
staio		10.081 1 L	9.207 kg
10⅔	rotolo	975.59 mL	891 g

^aOil was generally sold by weight

37.21.5 Units of Weight

In Campobasso

						Metric
cantaro						89.099 720 kg
100	rotolo					890.997 200 g
277 $\frac{7}{8}$	2 $\frac{7}{8}$	libbra				320.758 992 g
3 333 $\frac{1}{3}$	33 $\frac{1}{3}$	12	oncia			26.729 916 g
100,000	996	360	30	trappeso		890.997 2 mg
2,000,000	19,920	7200	600	20	acino	44.549 9 mg

For medical use

						Metric
libbra						320.758 992 g
12	oncia					26.729 916 g
120	10	dramma				2.672 991 6 g
360	30	3	scrupolo			890.997 2 mg
720	60	6	2	obolo		445.499 mg
7200	600	60	20	10	acino	44.549 9 mg

37.22 Piedmont (Turin as the Capital)

37.22.1 Currency

1799–1816: 1 Piedmont scudo = 6 lire = 120
soldi = 1440 denari; 1 doppia = 2
scudi

37.22.2 Units of Length

At Casale Monferrato and Novara

					Metric	Metric
trabucco					2.904 126 m	2.825 680 m
6	piede				484.021 mm	470.947 mm
72	12	oncia			40.335 mm	39.245 mm
864	144	12	punto		3.361 mm	3.270 mm
10,368	1728	144	12	atomo	280 μ m	272 μ m

Alternative scale at Casale Monferrato

				Metric
tesa				1.675 000 m
5	piede manuale			335.000 mm
60	12		oncia manuale	27.917 mm

At Novi Ligure

								Metric
cannella								2.977 000 m
–	trabucco							2.857 500 m
4	–	braccio						744.250 mm
–	6	–	piede					476.250 mm
12	$11\frac{2}{50}$	3	$1\frac{23}{25}$	palmo				248.083 mm
75	72	$18\frac{3}{4}$	12	$6\frac{1}{4}$	oncia			39.687 mm
900	864	225	144	75	12	punto		3.307 mm
10,800	10,368	2700	1728	900	144	12	atomo	276 µm

Upper scale at Turin before 1818

						Metric
miglio						2.32 km
400	pertica					5.803 m
800	2	trabucco				2.902 m
1440	$3\frac{3}{5}$	$1\frac{1}{5}$		teso		1.612 m
57,600	144	72		40	oncia	40.30 mm

Lower scale at Turin before 1818

							Metric
raso							564.20 mm
$1\frac{3}{4}$	piede manuale						322.40 mm
$2\frac{2}{41}$	$1\frac{7}{41}$	piede legale					275.38 mm
14	8	$6\frac{3}{6}$	oncia				40.30 mm
126	72	$61\frac{1}{2}$	9	punto manuale			4.478 mm
168	96	82	12	$1\frac{1}{3}$	punto liprando		3.358 mm
2016	1152	984	144	16	12	atomo	279.86 µm

Upper scale at Turin after 1818

						Metric
miglio						2.47 km
400	pertica					6.173 m
800	2	trabucco				3.087 m
1440	$3\frac{3}{5}$	$1\frac{1}{5}$		teso		1.715 m
57,600	144	72		40	oncia	42.87 mm

Lower scale at Turin after 1818

							Metric
raso							600.18 mm
$1\frac{3}{4}$	piede manuale						342.96 mm
$2\frac{2}{41}$	$1\frac{7}{41}$	piede legale					292.94 mm
14	8	$6\frac{3}{6}$	oncia				42.87 mm
126	72	$61\frac{1}{2}$	9	punto manuale			4.763 mm
168	96	82	12	$1\frac{1}{3}$	punto liprando		3.572 mm
2016	1152	984	144	16	12	atomo	297.71 µm

At Alessandria

					Metric
trabucco					2.861 370 m
6	piede				476.895 mm
72		oncia			39.741 mm
864	144	12	punto		3.312 mm
10,368	1728	144	12	atomo	276 μ m

At Verbania

					Metric
trabucco					2.611 110 m
6	piede				435.185 mm
72	12	oncia			36.265 mm
864	144	12	punto		3.022 mm
10,368	1728	144	12	atomo	252 μ m

Other reported measures:

- 1 **spazzo** (at Domodossola) = 8 ottavi = 1.983 121 m;
 1 **braccio** (for cloth at Domodossola) = 718.882 mm;
 1 **braccio** (for cloth and linen at Verbania) = 680.000 mm;
 1 **braccio** (for cloth and linen at Casale Monferrato) = 670.000 mm.
 1 **braccio lungo** (for cloth from Novara at Domodossola and Novara) = 668.787 mm;

- 1 **braccio** (for clothes at Alessandria) = 667.12 mm;

- 1 **braccio da legname** (at Novara) = 606.213 mm;

- 1 **raso** (for fabric in general from Piedmont) = 600.137 mm;

- 1 **braccio** (for timber at Domodossola) = 594.936 mm;

- 1 **braccio milanese** (for cotton at Verbania) = 594.936 mm;

- 1 **braccio da cotone** (at Novara) = 593.220 mm;

- 1 **braccio per la seta** (for silk at Alessandria) = 530.48 mm;

- 1 **braccio per la seta** (for silk at Casale Monferrato) = 526.000 mm;

- 1 **braccio per la seta** (for silk at Verbania) = 525.000 mm;

- 1 **braccio corto** (for silk from Novara, at Domodossola and Novara) = 524.184 mm.

37.22.3 Units of Area

In Turin before 1818 and after 1818

			Sq trabucchi	Metric	Metric
giornata			400	3658 m ²	3810 m ²
8 $\frac{1}{3}$	staro or stao		48	439.0 m ²	457.2 m ²
100	12	tavole	4	36.58 m ²	38.10 m ²

In Alessandria; at Acqui Terme; at Castellazzo Bormida; at Gamalero

					Metric	Metric	Metric	Metric
moggio					4715.964 4 m ²	8096 m ²	3328 m ²	3136 m ²
8	stao or stara				589.495 m ²	1012 m ²	416 m ²	392 m ²
144	18	tavola			32.749 75 m ²	56.2 m ²	23.1 m ²	21.8 m ²
1728	216	12	piede quadro		2.729 15 m ²	4.7 m ²	1.9 m ²	1.8 m ²
20,736	2592	144	12	oncia	22.742 9 dm ²	39 dm ²	16 dm ²	15 dm ²
248,832	31,104	1728	144	12	punto	1.895 2 dm ²	3.2 dm ²	1.3 dm ²

In Asti

				Metric
giornata				3810 m ²
8	staio			476.25 m ²
100	12½	tavola		38.10 m ²
1200	150	12	piede	3.175 m ²

At Casale Monferrato

					Metric
moggio					3238.635 96 m ²
8	staro				404.829 49 m ²
96	12	tavola			33.735 79 m ²
384	48	4	trabucco quadro		8.433 95 m ²
13,824	1728	144	36	piede quadro	23.427 63 dm ²

In the Province of Cuneo

					Metric
giornata					3810 m ²
100	tavola				38.1 m ²
400	4	trabucco			9.525 m ²
1200	12	3	piede		3.175 m ²
14,400	144	36	12	oncia	26.46 dm ²

At Domodossola

		Metric
staro		1573.108 3 m ²
400	spazzo quadro	3.932 771 m ²

At Domodossola

		Metric
braccio quadro		1.415 798 m ²
4	braccio milanese quadro	35.394 9 dm ²

At Novara

						Metric
moggio						3066.035 9 m ²
4	pertica					766.509 0 m ²
8	2	staro				383.254 5 m ²
96	24	12	tavola			31.937 874 m ²
384	96	48	4	trabucco quadro		7.984 469 m ²
13,824	3456	1728	144	36	piede quadro	22.179 1 dm ²

At Novara

		Metric
braccio d'asse		1.469 976 m ²
4	braccio da legname quadro	36.749 4 dm ²

At Novi Ligure

				Metric
pertica				783.869 4 m ²
24	tavola			32.661 2 m ²
96	4	trabucco quadro		8.165 306 m ²
3456	144	36	piede quadro	6.154 5 dm ²

At Verbania

				Metric
pertica				654.517 90 m ²
24	tavola			27.271 581 m ²
96	4	quadretto		6.817 895 m ²
384	16	4	braccio milanese quadro	35.394 9 dm ²

37.22.4 Units of Volume

For timber at Novara

				Metric
tesa da legna verde				3.032 273 m ³
–	tesa cuba			2.830 122 m ³
–	–	spazzo		1.782 240 m ³
13 ^{23/54}	12 ^{19/27}	8	braccio da legname cuba	222.780 dm ³

For the measurement of walls, stones and wood for construction at Novi Ligure

			Metric
cannella cuba			26.383 749 m ³
6	cannella da muro		4.397 291 m ³
1728	288	palmo cubo	15.268 dm ³

At Novi Ligure

		Metric
trabucco cubo		23.332 363 m ³
288	piede cubo	108.020 dm ³

Some reported measures:

- 1 **trabucco cubo di Piemonte** = 29.401 194 m³;
- 1 **trabucco cubo** (for hay, straw and wood at Casale Monferrato) = 24.493 255 m³;
- 1 **spazzo cubo** (at Domodossola) = 2 spazzi pieni = 7.799 162 m³;
- 1 **tesa cuba** (for hay, straw and wood at Casale Monferrato) = 4.699 422 m³;
- 1 **mauer-trabucco** = 4.068 365 m³;
- 1 **spazzo pieno** (for firewood at Domodossola) = 3.899 581 m³;
- 1 **moggio** (for charcoal at Domodossola) = 596.13 dm³;
- 1 **moggio** (for charcoal at Novara) = 225.100 dm³;
- 1 **quadretto di volume** (for timber at Verbania) = 210.577 dm³;
- 1 **braccio cubo** (for timber at Domodossola) = 21.057 7 dm³;
- 1 **spazzo** = 28 ounce cube = 1.729 085 m³;
- 1 **piede cubo di Piemonte** = 136.117 dm³;
- 1 **piede cubo** (for hay, straw and wood at Casale Monferrato) = 113.394 66 dm³;
- 1 **piede manuale cubo di Piemonte** = 40.331 dm³.

37.22.5 Units of Dry Capacity

At Alessandria

			Metric
salma			213.258 624 L
12	staio		17.771 552 L
192	16	coppo	1.110 722 L

At Casale Monferrato

				Metric
sacco				129.306 40 L
8	staro			16.163 30 L
128	16	coppo		1.010 20 L
1536	192	12	cucchiaio or copetta	84.184 mL

For cereals at Turin

						Metric
sacco						114.952 L
3	staio					38.317 L
5	1⅔	emina				22.990 L
10	3⅓	2	quartiere			11.495 L
40	13⅓	8	4	coppo or coppella		2.873 8 L
960	320	192	96	24	cucchiaro	119.7 mL

Milanese system at Verbania

					Metric
moggio					142.234 295 L
8	staio				17.779 287 L
32	4	quartaro			4.444 822 L
128	16	4	meta		1.111 205 L
512	64	16	4	quartino	277.801 mL

For cereals at Domodossola

					Metric
soma					211.250 000 L
6½	staio				32.496 200 L
13	2	emina			16.248 100 L
26	4	2	quarterone		8.124 050 L
52	8	4	2	coppo	1.015 506 L

For cereals at Novara

			Metric
sacco			126.472 880 L
8	emina		15.809 110 L
128	16	coppo	988.069 mL

At Novi Ligure

				Metric
mina				116.080 000 L
4	staio			29.020 000 L
16	4	quartaro		7.255 000 L
96	24	6	gombetta	1.209 167 L

At Verbania

			Metric
sacco			245.498 000 L
8	staro		30.687 250 L
16	2	emina	15.343 625 L

37.22.6 Units of Liquid Capacity

At Alessandria

		Metric
brenta		57.839 400 L
34	pinta	1.701 159 L

At Casale Monferrato

						Metric
brenta						73.210 500 L
8	secchia					9.151 312 L
45	5 ⁷ / ₈	pinta				1.626 900 L
90	11 ¹ / ₄	2	boccale			813.450 mL
180	22 ¹ / ₂	4	2	quartino		406.725 mL
360	45	8	4	2	bicchiere	203.362 mL

At Domodossola

						Metric
brenta						53.991 200 L
3	emina					17.997 067 L
6	2	quarterone				8.998 533 L
48	16	8	boccale			1.124 817 L
192	64	32	4	quartino		281.204 mL

For wine at Novara

				Metric
brenta				54.679 680 L
4	mina			13.669 920 L
36	9	pinta		1.518 880 L
72	18	2	boccale	352.700 mL

For milk at Novara

				Metric
brenta				72.906 240 L
3	staio			24.302 080 L
48	16	pinta		1.518 880 L
96	32	2	boccale	352.700 mL

For oil at Novara

				Metric
libbra				352.700 mL
2	metà			176.350 mL
4	2	quarta		88.175 mL
8	4	2	ottava	44.087 mL

At Novi Ligure before 1850

		Metric
barile		54.662 000 L
52	boccale or amola	1.051 190 L

Metric-linked system at Novi Ligure after 1850

			Metric
barile			53 L
26 ¹ / ₂	pinta		2 L
53	2	amola	1 L

At Turin

							Metric
carro							493.056 L
1¼	bottale						394.444 8 L
10	8	brenta					49.305 6 L
360	288	36	pinta				1.369 6 L
720	576	72	2	boccale			684.8 mL
1440	1152	144	4	2	quartino		342.4 mL
2880	2304	288	8	4	2	bicchiero	171.2 mL

At Verbania

			Metric
brenta			56.665 800 L
36	pinta		1.574 050 L
72	2	boccale	787.025 mL

37.22.7 Units of Weight

At Alessandria

						Metric
cantaro						47.110 624 kg
6	rubbo					7.851 771 kg
150	25	libbra				314.070 8 g
1800	300	12	oncia			26.172 6 g
43,200	7200	288	24	denaro		1.090 5 g
1,036,800	172,800	6912	576	24	grano	45.4 mg

At Casale Monferrato

							Metric
rubbo							8.134 500 kg
25	libbra						325.380 g
300	12	oncia					27.115 g
1152	96	8	ottavo				3.389 37 g
3456	288	24	3	denaro			1.129 79 g
82,944	6912	576	72	24	grano		470.75 mg
1,990,656	165,888	13,824	1728	576	24	granotto	19.61 mg

At Domodossola

							Metric
rubbo milanese							8.169 826 kg
25	libbra ^a						326.793 g
300	12	oncia					27.233 g
2400	96	8	ottavo				3.404 g
7200	288	24	3	denaro			1.135 g
172,800	6912	576	72	24	grano		47.3 mg
4,147,200	165,888	13,824	1728	576	24	granotto	2.0 mg

^aThere were also other libbra in use: 1 libbra = 36 ounce = 980.379 g, 1 libbra = 28 ounce = 762.517 g

For hay, charcoal and firewood at Domodossola

			Metric
centinaio			87.144 800 kg
100	libbra		871.448 g
3200	32	oncia	27.233 g

At Novara

									Metric
fascio									75.943 900 kg
$3\frac{1}{15}$	rubbo								8.136 850 kg
$93\frac{1}{3}$	25	libbra da pesci							813.685 g
100	$26\frac{1}{14}$	$1\frac{1}{4}$	libbra grossa						759.439 g
$233\frac{1}{3}$	$62\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{3}$	libbra					325.474 g
2800	750	30	28	12	oncia				27.133 g
67,200	18,000	720	672	288	24	denaro			1.130 g
1,612,800	432,000	17,280	16,128	6912	576	24	grano		47 mg
38,707,200	10,368,000	414,720	387,072	165,888	13,824	576	24	granotto	2 mg

At Turin

								Metric
rubbio								9.216 kg
25	libbra							368.64 g
300	12	oncia						30.72 g
2400	96	8	ottavo					3.84 g
7200	288	24	3	denaro				1.28 g
172,800	6912	576	72	24	grano di zecca			53.4 mg

At Verbania

									Metric
fascio									87.144 816 kg
$10\frac{2}{3}$	rubbo								8.169 826 kg
100	$9\frac{3}{8}$	libbra							871.448 g
$114\frac{1}{7}$	$10\frac{1}{7}$	$1\frac{1}{7}$	libbra grossa						762.517 g
$266\frac{2}{3}$	25	$2\frac{2}{3}$	$2\frac{1}{3}$	libretta					326.793 g
3200	300	32	28	12	oncia				27.233 g
25,600	2400	256	224	96	8	ottavo			3.404 g
76,800	7200	768	672	288	24	3	denaro		1.135 g
1,843,200	172,800	18,432	16,128	6912	576	72	24	grano	47 mg
44,236,800	4,147,200	442,368	387,072	165,888	13,824	1728	576	24	granotto 2 mg

For medical use at Alessandria, Novara and Turin

					Metric
libbra					307.44 g
18	uncia				17.08 g
108	6	dramma			2.847 g
324	18	3	scrupulo		948.9 mg
6480	360	60	20	grano	47.44 mg

For gold and silver at Novara

					Metric
marco di zecca					234.997 300 g
8	uncia				29.374 662 g
192	24	denaro			1.223 944 g
4608	576	24	grano		50.998 mg
110,592	13,824	576	24	granotto	2.125 mg

37.23 Sardinia (Cagliari as the Capital)

See *Kingdom of Sardinia*.

37.24 Sicily (Palermo as the Capital)

See *Sicily*.

37.25 Trentino-Alto Adige (Trento as the Capital)

See *Tyrol*.

37.26 Tuscany (Florence as the Capital)

See also *Etruria*.

37.26.1 Currency

1826–1859: 1 Tuscan fiorino = 100 quattrini
1 paolo = 40 quattrini
?–1826: 1 Tuscan lira = 1½ paoli = 12 crazie = 20 soldi = 60 quattrini = 240 denari
1 francescone or tallero = 10 paoli = 400 quattrini
1 ruspone = 3 zecchini = 40 lire
1252–1533: 1 Florin

37.26.2 Units of Length

For cloth in Florence before 1782

		Metric
braccio a panno		559.620 mm
12	crazia	46.635 mm

At Carrara

			Metric
pertica agrimensoria			3.576 m
12	piede or braccio		298 mm
144	12	pollice	24.833 mm

For timber at Carrara

		Metric
canna		624.545 mm
12	uncia	52.045 mm

Commercial scale at Carrara

		Metric
braccio mercantile		619.725 mm
12	uncia	51.644 mm

For marble at Carrara

		Metric
palmo		249.267 mm
12	uncia	20.772 mm

At Castelnuovo di Garfagnana

			Metric
braccio			595.50 mm
12	oncia		49.625 mm
144	12	punto	4.135 mm

Upper scale for general use in Florence and at Pisa

							Metric
lega							4960.821 m
3	miglio toscano						1653.607 m
1700	$566\frac{2}{3}$	pertica or canna agrimensoria					2.918 130 m
2125	$708\frac{1}{3}$	$1\frac{1}{4}$	canna mercatoria				2.334 504 m
$2\ 833\frac{1}{3}$	$944\frac{4}{9}$	$1\frac{2}{3}$	$1\frac{1}{3}$	passo			1.750 878 m
4250	$1\ 416\frac{2}{3}$	$2\frac{1}{2}$	2	$1\frac{1}{2}$	passetto		1.167 252 m
17,000	$5\ 666\frac{2}{3}$	10	8	6	4	palmo	291.813 mm

Lower scale for general use in Florence and at Pisa

							Metric
braccio fiorentino or braccio da panno							583.626 mm
2	palmo						291.813 mm
12	6	crazia					48.635 5 mm
20	10	$1\frac{2}{3}$	soldo				29.181 3 mm
60	30	5	3	quattrino			9.727 1 m
240	120	20	12	4	denaro		2.431 8 mm
2880	1440	240	144	48	12	punto	202.6 μ m

At Livorno, based on [MART3]

							Metric
lega di Posta							3897.989 418 m
$1\ 335\frac{141}{180}$	pertica						2.918 130 m
$1\ 669\frac{109}{144}$	$1\frac{1}{4}$	canna					2.334 504 m
$2\ 226\frac{11}{36}$	$1\frac{2}{3}$	$1\frac{1}{3}$	passo^a				1.750 878 m
$6\ 678\frac{11}{12}$	5	4	3	braccio^a			583.626 mm
160,294	120	96	72	24	polsata^a		24.318 mm

^aFor the hawsers of vessels

At Lucca, based on [MART3]

							Metric
miglio							1771.500 000 m
600	pertica						2.952 500 m
750	$1\frac{1}{4}$	canna					2.363 000 m
3000	5	4	braccio				590.500 mm
36,000	60	48	12	oncia			49.208 mm
432,000	720	576	144	12	punto		4.101 mm
5,184,000	8640	6912	1728	144	12	atomo	342 μ m

Other reported measures:

- 1 **passetto da tela** (for cloth at Arezzo) = 778.168 mm;
- 1 **pertica** (for surveying at Castelnuovo di Garfagnana) = 3.573 m;
- 1 **passetto da panno** (for cloth at Arezzo) = 1.167 252 m;

37.26.3 Units of Area

In the Province of Arezzo

							Metric
soma							6812 m ²
2	quadrato						3406 m ²
4	2	staio					1703 m ²
20	10	5	tavola				340.6 m ²
200	100	50	10	pertica			34.06 m ²
2000	1000	500	100	10	deca		3.406 m ²
20,000	10,000	5000	1000	100	10	braccio quadro	34.06 dm ²

At Carrara

			Metric
quartiere			127.877 76 m ²
100	pertica		1.278 777 6 m ²
144	14 ² / ₃	piede quadro	8.880 4 dm ²

At Empoli

			Metric
staiata			1703.095 6 m ²
–	stioro		721.885 5 m ²
5000	2 119 ² / ₃	braccio quadro	34.061 9 dm ²

In Florence before 1782

						Metric
saccata						6300.091 008 m ²
12	stioro fiorentino					525.007 584 m ²
144	12	panora				43.750 632 m ²
1728	144	12	pugnorio			3.645 886 m ²
20,736	1728	144	12	braccio quadro		30.382 dm ²

In Florence after 1782

								Metric
miglio quadro								2,734,416.110 4 m ²
802 ² / ₃	quadrato							3,406.191 2 m ²
8 027 ² / ₃	10	tavola						340.619 1 m ²
80, 277 ² / ₃	100	10	pertica					34.061 91 m ²
802, 777 ² / ₃	1000	100	10	deca				3.406 19 m ²
8, 027, 777 ² / ₃	10,000	1000	100	10	braccio quadro			34.061 91 dm ²
80, 277, 777 ² / ₃	4,000,000	400,000	40,000	4000	400	soldo quadro		8.515 cm ²
802, 777, 777 ² / ₃	36,000,000	3,600,000	360,000	36,000	3600	9	quattrino quadro	94.6 mm ²
8, 027, 777, 777 ² / ₃	576,000,000	57,600,000	5,760,000	576,000	57,600	144	16	denaro 5.9 mm ²

Metric-linked system in Florence

				Sq Pertiche	Metric
quadrato				400	3406 m ²
10	portica			40	340.6 m ²
100	10	tavole		4	34.06 m ²
1000	100	10	decha	0.4	3.406 m ²

At Livorno, based on [MART3]

										Metric
saccata^a										5109.286 5 m ²
–	saccata^b									4598.357 8 m ²
–	–	quadrato								3406.191 2 m ²
–	–	–	staiata^a							1873.404 5 m ²
–	–	–	–	staiata^b						1686.064 0 m ²
–	–	–	–	3	stioro					562.021 3 m ²
–	–	10	–	–	–	tavola				340.619 1 m ²
600	540	400	220	198	66	40	pertica			8.515 475 m ²
1500	1350	1000	550	495	165	100	2½	deca		3.406 191 m ²
15,000	13,500	10,000	5500	4950	1650	1000	25	10	braccio quadro	34.061 91 dm ²

^aIn hilly terrain^bOn flat ground

At Lucca, based on [MART3]

				Metric
coltra				4009.937 9 m ²
4	quartiere			1002.484 5 m ²
460	115	pertica quadra		8.717 256 m ²
11,500	2875	25	braccio quadro	34.869 dm ²

At Pisa

						Metric
moggiolo						13,488.517 2 m ²
2⅔	saccata					5058.193 9 m ²
8	3	staiata				1686.064 6 m ²
24	9	3	stioro			562.021 5 m ²
1584	594	198	66	pertica		8.515 478 m ²
39,600	14,850	4950	1650	25	bracciolo	34.061 9 dm ²

At Pistoie

					Metric
coltra					5064.230 0 m ²
4	stioro				1266.057 5 m ²
48	12	panoro			105.504 8 m ²
576	144	12	pugnorio		8.792 067 m ²
9216	2304	192	16	braccio quadro	549.504 dm ²

At Portoferraio

						Metric
Saccata						5109.286 8 m ²
4	quarto					1277.321 7 m ²
600	150	pertica				8.515 478 m ²
15,000	3750	25	braccio quadro			34.061 9 dm ²
6,000,000	1,500,000	10,000	400	soldo quadro		8.52 cm ²
864,000,000	216,000,000	1,440,000	57,600	144	denaro quadro	5.9 mm ²

Other reported measures:

- 1 **stioro** (at Arezzo) = 1703.095 6 m²;
- 1 **staio** (in Florence) = 1666.67 m²;
- 1 **stioro** (in Florence) = 525 m²;
- 1 **mezzio** (at Castelnuovo di Garfagnana) = 374 m²;
- 1 **pertica quadrata** (for surveying at Castelnuovo di Garfagnana) = 12.766 33 m².

For timber in Florence

			Metric
traino			3.578 292 m ³
2	braccio cubo		198.794 dm ³
24	12	bracciola	16.566 dm ³

37.26.4 Units of Volume

For firewood in Florence

		Metric
catasta		4.771 059 m ³
24	braccio cubo	198.794 dm ³

For commercial use in Florence

							Metric
catasta							3.578 292 m ³
18	braccio cubo						198.794 dm ³
108	6	bracciolo					33.132 dm ³
196	72	12	oncia				2.761 dm ³
144,000	8000	1 333⅓	111⅓	soldo cubo			24.85 cm ³
3,888,000	216,000	36,000	3000	27	quattrino cubo		92.0 mm ³
248,832,000	13,824,000	2,304,000	192,000	1728	64	denaro cubo	1.4 mm ³

For cut stones at Lucca, based on [MART3]

		Metric
scandiglio		3.294 425 m ³
16	braccio cubo	205.902 dm ³

For timber at Pisa

				Metric
catasta				4.771 059 m ³
1½	scandiglio			3.180 706 m ³
12	8	traino		397.588 dm ³
24	16	2	braccio cubo	198.794 dm ³

For timber at Pistoie

				Metric
catasta				4.771 059 m ³
4	catastino			1.192 764 m ³
24	6	braccio cubo		198.794 dm ³

Other reported measures:

1 **palma cubo** = 15.268 dm³.

37.26.5 Units of Dry Capacity

At Carrara

				Metric
Sacco				72.507 6 L
3	secchia or mina			24.169 2 L
24	8	quarretta		3.021 15 L

At Castelnuovo di Garfagnana

			Metric
Sacco			133.33 L
8	mezzino		16.67 L

In Grosseto, based on [MART3]

				Metric
Staio				22.748 800 L
16	boccale			1.421 800 L
64	4	quartuccio		355.450 mL

Upper scale for cereals in Florence before 1782

					Metric
moggio					584.694 86 L
8	sacco				73.086 86 L
24	3	stajo			24.362 86 L
48	6	2	mine		12.181 14 L
96	12	4	2	quarto	6.090 57 L

Lower scale for cereals in Florence before 1782

						Metric
quarto						6.090 57 L
4	metadella					1.522 64 L
8	2	mezzetta				761.3 mL
16	4	2	quartuccio			380.7 mL
32	8	4	2	bussola		190.3 mL

In Florence after 1782

							Metric
moggio							584.708 688 L
8	sacco						73.088 586 L
24	3	staio					24.362 862 L
48	6	2	mina				12.181 431 L
96	12	4	2	quarto			6.090 715 L
768	96	32	16	8	mezzetta		761.339 mL
1536	192	64	32	16	2	quartuccio	380.668 mL

For grain at Livorno

								Metric
rubbio								274.04 L
$3\frac{3}{4}$	sacco							73.077 L
$11\frac{1}{4}$	3	stajo						24.359 L
45	12	4	quarto					6.090 L
190	$50\frac{2}{3}$	$16\frac{2}{3}$	$4\frac{2}{3}$	metadella				1.442 L
360	96	32	8	$1\frac{17}{19}$	mezzetta			761.2 mL
720	192	64	16		2	quartuccio		380.6 mL
1440	384	128	32		4	2	bussola	190.3 mL

At Lucca, based on [MART3]

						Metric
sacco						73.289 640 L
3	staio					24.429 880 L
6	2	mezzino				12.214 940 L
12	4	2	quarra			6.107 470 L
48	16	8	4	quartuccio		1.526 868 L

At Pistoia

				Metric
staio				25.923 600 L
4	quarto			6.480 900 L
64	16	quartuccio		405.056 mL
6400	1600	100	centesimo	4.051 mL

37.26.6 Units of Liquid Capacity

At Carrara before 1852 and after 1852

		Metric	Metric
barile		49.655 000 L	42.998 600 L
32	boccale	1.551 719 L	1.343 706 L

At Castelnuovo di Garfagnana

		Metric
barile		39.175 L
56	boccale	699.5 mL

For oil (... “d’olio”) in Florence

						Metric
soma						66.857 816 L
2	barile					33.428 908 L
32	16	fiascho				2.089 306 L
64	32	2	boccale			1.044 653 L
128	64	4	2	mezzetta		522.326 mL
256	128	8	4	2	quartuccio	261.163 mL

For wine (...“da vino” or ...”legale”) in Florence

							Metric
cogno							455.840 410 L
5	soma						91.168 082 L
10	2	barile					45.584 041 L
15	3	1½	staione				30.389 361 L
200	40	20	13⅓	fiascho			2.279 204 L
400	80	40	26⅔	2	boccale		1.139 602 L
800	160	80	53⅓	4	2	mezzetta	569.801 mL
1600	320	160	106⅔	8	4	2	quartuccio 284.901 mL

For oil at Livorno

				Metric	Metric
soma				66.85 L	59.759 392 kg
2	barile			33.425 L	29.879 696 kg
32	16	fiascho		2.089 L	1.867 481 kg
64	32	2	boccale	1.044 L	933.740 g

For wine at Lucca, based on [MART3]

				Metric	Metric
barile				40.207 700 L	40.140 000 kg
17	fiasco			2.365 150 L	2.361 176 kg
34	2	boccale		1.182 579 L	1.180 588 kg
102	6	3	mezzetta	591.290 mL	–
204	12	6	2	quartuccio	–

For oil at Lucca, based on [MART3]

			Metric	Metric
barile			43.784 400 L	40.140 000 kg
10	libbra alla grossa		4.378 440 L	4.014 kg
120	12	libbreta	364.870 mL	334.500 g

Maritime scale for oil at Lucca, based on [MART3]

			Metric	Metric
barile della Marina			47.433 100 L	43.485 0 kg
10	libbra alla grossa		4.743 310 L	4.348 5 kg
120	13	libbreta	364.870 mL	334.500 g

For oil at Pisa

				Metric	Metric
barile				32.686 000 L	29.879 696 kg
16	fiasco			2.042 875 L	1.867 481 kg
32	2	boccale		1.021 438 L	933.740 g
64	4	2	mezzetta	510.719 mL	466.870 g
128	8	4	2	quartuccio	233.435 g

For wine at Pistoia

				Metric
barile				39.088 300 L
20	fiasco			1.954 415 L
160	8	quartuccio		244.302 mL
16,000	800	100	centesimo	2.443 mL

For wine at Portoferraio

				Metric
barile				41.025 000 L
1¼	collarello			32.820 000 L
20	16		fiasco	2.051 250 L

Other reported measures:

- 1 **barile** (for wine in Grosseto) = 42.484 300 L;
1 **barile** (for oil in Grosseto) = 41.300 000 L;
1 **staio** (for oil at Montepulciano) = 28.228
900 L;
1 **staio** (for wine at Montepulciano) = 27.350
400 L.

37.26.7 Units of Weight

At Carrara

				Metric
libbra				324.997 g
12	uncia			27.083 1 g
288	24	denaro		1.128 5 g
6912	576	24	grano	47.0 mg

At Castelnuovo di Garfagnana

				Metric
libbra				334 g
12	uncia			27.83 g
288	24	denaro		1.16 g

For general use in Florence and at Pisa

												Metric
tonnellata												679.084 000 kg
2	migliaio											339.542 000 kg
12½	6¼	cantaro										54.326 720 kg
13⅓	6⅔	1⅓	cantaro									50.931 300 kg
20	10	1⅓	1½	quintale								33.954 200 kg
666⅔	333⅓	53⅓	50	33⅓	rotolo							1.018 6 kg
2000	1000	160	150	100	3	libbra						339.542 g
24,000	12,000	1920	1800	1200	36	12	uncia					28.295 g
192,000	96,000	15,360	14,400	9600	288	96	8	dramma				3.537 g
576,000	288,000	46,080	43,200	28,800	864	288	24	3	denaro			1.179 g
13,824,000	6,912,000	1,105,920	1,036,800	691,200	20,736	6912	576	72	24	grano		49.1 mg

At Lucca, based on [MART3]

				Metric
libbra				334.500 g
12	uncia			27.875 g
288	24	denaro		1.161 g
6912	576	24	grano	48 mg

At Portoferraio

				Metric
tonnellata				1018.626 000 kg
20	saccata			50.931 300 kg
3000	150	libbra		339.542 g

At Pistoia

					Metric
libbra					323.500 g
12	uncia				29.958 g
96	8	dramma			3.370 g
288	24	3	denaro		1.123 g
6912	576	72	24	grano	47 mg

For medical use

					Metric
libbra medicinal					340.456 680 g
12	uncia				28.371 390 g
96	8	dramma			3.546 424 g
288	24	3	scrupolo		1.182 141 g
6912	576	72	24	grano	49.256 mg

For medical use in Florence and at Lucca, based on [MART3]

					Metric	Metric
libbra medicinal					339.542 000 g	334.500 000 g
12	uncia				28.295 167 g	27.875 000 g
96	8	dramma			3.536 896 g	3.484 375 g
288	24	3	scrupolo		1.178 965 g	1.161 458 g
6912	576	72	24	grano	49.124 mg	48.394 mg

For gold, silver and money in Florence and at Lucca

					Metric
libbra					339.542 000 g
12	uncia				28.295 167 g
288	24	denaro			1.178 965 g
6912	576	24	grano		49.123 mg
331,776	27,648	1152	48	quarantottesimo	1.023 mg

For jewels in Florence

		Metric
carato		196.494 mg
4	grano	49.123 mg

Other reported measures:

1 **barile** (for wine in Livorno) = $133\frac{1}{3}$ libbre = 45.272 267 kg.

37.27 Umbria (Perugia as the Capital)

37.27.1 Units of Length

For agricultural use at Perugia

					Metric
canna					5.452 500 m
7½	passetto				727.000 mm
15	2	piede			363.500 mm
180	24	12	palmo		251.062 mm
—	—	—	—	oncia	30.292 mm

For silk at Perugia

			Metric
canna			2.008 500 m
2	braccio		1.004 250 m
8	4	palmo	251.062 mm

37.27.2 Units of Area

In Perugia

			Metric
mina			4459.463 4 m ²
150	tavola		29.729 756 m ²
33,750	225	piede quadro	13.213 2 m ²

37.27.3 Units of Volume

At Perugia

		Metric
canna cuba		11.152 616 m ³
1000	palmo cubo	11.152 616 dm ³

37.27.4 Units of Dry Capacity

At Perugia

								Metric
rubbio^a								336.015 000 L
1⅓ ₁₆	rubbio^b							282.960 000 L
2⅞	2	sacco						141.480 000 L
4¾	4		mina					70.740 000 L
9½	8	4	2	staio				35.370 000 L
19	16	8	4	2	quarto			17.685 000 L
76	64	32	16	8	4	coppa		4.421 250 L
304	256	128	64	32	16	4	scodella	1.105 312 L

^aFor vegetables

^bFor wheat

37.27.5 Units of Liquid Capacity

For wine at Perugia

						Metric
soma						95.340 000 L
2	barile					47.670 000 L
42	21	boccale				2.270 000 L
84	42	2	mezzo			1.135 000 L
168	84	4	2	foglietta		567.500 mL
336	168	8	4	2	quartuccia	283.750 mL

For must at Perugia

						Metric
soma						99.880 000 L
2	barile					49.940 000 L
44	22	boccale				2.270 000 L
88	44	2	mezzo			1.135 000 L
176	88	4	2	foglietta		567.500 mL
352	176	8	4	2	quartuccia	283.750 mL

For oil at Perugia

						Metric
mezzolino						24.160 000 L
4	quarto					6.040 000 L
60	15	libbra				402.667 mL
120	30	2	mezza			201.333 mL
240	60	4	2	terzetto		100.667 mL

37.27.6 Units of Weight

At Perugia

					Metric
libbra					337.815 g
12	oncia				28.151 g
96	8	ottava			3.519 g
288	24	3	denaro		1.173 g
6912	576	72	24	grano	49 mg

37.28 Veneto (Venice as the Capital)

37.28.1 Currency

1807–1816: 1 Napoleonic Italian lira = 100 centesimos

–1807: 1 Venetian lira = 20 soldi = 240 denari; 1 tallero or zecchino = 7 lire; 1 ducato = 124 soldi

37.28.2 Units of Length

At Padua

				Metric
pertica				2.144 365 m
6	piede			357.394 mm
72	12	oncia or pollice		29.783 mm
864	144	12	linea or minuto	2.482 mm

Alternative system at Padua

		Metric
trabucco		2.837 m
6	piede	472.8 mm

At Rovigo

			Metric
miglio			1738.674 000 m
1000	passo		1.738 674 m
5000	5	piede da fabbrica	347.735 mm

Upper scale for general use in Venice

					Metric
miglio					1738.674 m
833 $\frac{1}{3}$	cavezzo or pertica				2.086 409 m
1000	1 $\frac{1}{5}$	passo			1.738 674 m
1 111 $\frac{1}{5}$	1 $\frac{1}{5}$	1 $\frac{1}{5}$	ghebbo or pertica piccolo		1.564 807 m
60,000	72	60	54	oncia fabbrica	28.978 mm

Lower scale for general use in Venice

					Metric
braccio					695.468 mm
2		piede			347.734 mm
24		12	oncia fabbrica		28.978 mm
288		144	12	linea	2.415 mm
2880		1440	120	10 decimo	241.5 μ m

In Verona

					Metric
cavezzo or pertica					2.057 490 m
1 $\frac{1}{5}$	passo				1.714 575 m
6	5	piede			342.915 mm
72	60	12	oncia		28.576 25 mm
864	720	144	12	linea	2.381 35 mm

For wool in Venice

				Metric
braccio da lana				683.396 mm
4	quarta			170.849 mm
8	2	ottavo		85.424 mm
12	3	1 $\frac{1}{2}$	oncia da lana	56.950 mm

For maritime use in Venice

		Metric
grade des aequators		111,297.9 m
60	miglio marino	1854.965 m

At Vicenza

			Metric
pertica			2.144 364 m
6	piede		357.394 mm
72	12	oncia	29.783 mm

Other reported measures:

- 1 **miglio veneto** (in Verona) = 1738.674 m;
 1 **braccio da panno** (for cloth at Vicenza) = 690.305 mm;
 1 **braccio da panno** (for cloth at Padua) = 680.981 mm;
 1 **braccio da panno** (for cloth at Rovigo) = 669.820 mm;
 1 **braccio lungo** (in Verona) = 649 mm;
 1 **braccio corto** (in Verona) = 642.46 mm;
 1 **braccio da seta** (for silk in Venice) = 638.721 mm;
 1 **braccio da seta** (for silk at Padua and Vicenza) = 637.514 m;
 1 **braccio da seta** (for silk at Rovigo) = 632.809 mm;
 1 **piede agrimensorio** (at Rovigo) = 384.230 mm.

37.28.3 Units of Area

At Padua

				Metric
campo				3862.572 6 m ²
4	quarta			965.643 1 m ²
840	210	tavola, pertica quadra or canna quadra		4.598 301 m ²
30,240	7560	36	piede quadro	127.732 dm ²

At Rovigo

					Metric
biolca					6696.611 5 m ²
1½	campo				4464.407 7 m ²
18	12	quarta			372.034 0 m ²
1260	840	70	tavola		5.314 771 m ²
45,360	30,240	2520	36	piede agrimensorio quadro	14.763 2 dm ²

In Venice

						Metric
campo						3656.606 4 m ²
1 ^{131/625}	migliaio					3022.988 1 m ²
840	694 ^{4/9}	tavola				4.353 103 m ²
1 209 ^{3/5}	1000	1 ^{11/25}	passo quadrato			3.022 988 m ²
1 741 ^{103/125}	1 234 ^{46/81}	1 ^{7/9}	1 ^{19/81}	chebbo		2.448 620 m ²
35,271 ^{117/125}	25,000	36	25	20 ^{1/4}	piede quadro	12.091 9 dm ²

In Verona

				Metric
campo				3047.950 872 m ²
24	vaneze			126.997 953 m ²
720	30	tavola		4.233 265 m ²
25,920	1080	36	piede quadro	11.759 07 dm ²

In Vicenza

			Metric
campo			3862.569 450 m ²
840	tavola		4.598 297 m ²
30,240	36	piede quadro	12.773 05 dm ²

Other reported measures:

- 1 **pertica** = 1000 m²;
- 1 **calvia** (at Vodo di Cadore) = 897 m²;
- 1 **staio** (at Seren del Grappa) = 845 m²;
- 1 **staio** (at Mel) = 776 m²;
- 1 **calvia** (at Zoldo Alto and Zoppè di Cadore) = 300 m².

37.28.4 Units of Volume

At Padua

				Metric
carro aperto				19.721 081 m ³
–	carro chiuso			14.790 811 m ³
–	–	passo cubo		5.706 331 m ³
432	324	125	piede cubo	45.650 dm ³

At Rovigo

		Metric
tavola da lavoro		1.513 728 m ³
36	piede cubo	42.048 dm ³

For timber at Rovigo

			Metric
passo cubo			7.090 625 m ³
–	passetto		4.084 200 m ³
125	72	piede cubo	56.725 dm ³

For timber in Venice and at Vicenza

		Metric	Metric
passo cubo		5.256 m ³	5.706 26 m ³
125	piede cubo	42.048 dm ³	45.650 1 dm ³

Other reported measures:

1 **piede cubo** (at Vicenza) = 42.048 dm³.

In Venice

						Metric
moggio						333.268 800 L
$2\frac{2}{3}$	sacco					124.975 800 L
4	$1\frac{1}{2}$	staio or staro				83.317 200 L
8	3	2	mezzeno			41.658 600 L
16	6	4	2	quarta		20.829 300 L
64	24	16	8	4	quartarole	5.207 325 L

37.28.5 Units of Dry Capacity

At Padua

						Metric
moggio						347.801 600 L
3	sacco					115.933 867 L
12	4	staio				28.983 467 L
48	16	4	quarta			7.245 867 L
192	64	16	4	coppo		1.811 467 L
768	256	64	16	4	scodella	452.867 mL

At Rovigo

					Metric
sacco					99.439 300 L
3	staio				33.146 433 L
12	4	quarta			8.286 608 L
48	16	4	quarterolo		2.071 652 L
144	48	12	3	scodella	690.551 mL

In Verona

				Metric
carico				917.228 000 L
8	sacco			114.653 500 L
24	3	minale		38.217 833 L
96	12	4	quarta	9.554 458 L

At Vicenza

				Metric
sacco				108.172 700 L
4	staio			27.043 175 L
64	16	quartarolo		1.690 198 L

37.28.6 Units of Liquid Capacity

At Padua

					Metric
mastello					71.275 500 L
8		secchio			8.909 437 L
72		9	bozza		989.937 mL
288		36	4	gotto	247.484 mL

At Rovigo

						Metric
mastello						104.790 200 L
1½		mastelletto				69.860 133 L
6		4	secchio			17.465 033 L
108		72	18	bozza		970.280 mL
432		288	72	4	gotto	242.570 mL

For wine in Venice, based on [DOUR]

										Metric
burchio										38,880 L
60	botte									648 L
75	1¼	anfora								518.4 L
300	5	4	bigoncia							129.6 L
600	10	8	2	mastello or concia						64.8 L
1200	20	16	4	2	quarta					32.4 L
3600	60	48	12	6	3	secchia				10.8 L
14,400	240	192	48	24	12	4	bozza			2.7 L
38,400	640	512	128	64		10⅔	2⅔	boccale		1.012 L
57,600	960	768	192	96	48	16	4	1½	quartuccio	675 mL

For wine in Venice, based on [MART3]

										Metric
burchio										45,070.200 L
60	botte									751.170 L
75	1¼	anfora								600.936 L
300	5	4	bigoncia							150.234 L
600	10	8	2	mastello						75.117 L
700	11⅔	9⅓	2⅓	1⅙	barila					64.385 900 L
3600	60	48	12	7	6	secchia				10.730 983 L
14,400	240	192	48	28	24	4	bozza			2.682 746 L
57,600	960	768	192	112	96	16	4	quartuccio		670.686 mL
268,800	4480	3584	896	448	384	64	16	4	gotto	167.772 mL

For oil in Venice, based on [MART3] and [WINS]

					Metric
botte					1263.184 L
2	migliaio				631.592 L
5	2½	bigoncia			252.636 8 L
80	40	16	miro		15.789 8 L

In Verona

					Metric
botte					846.133 200 L
12	brento				70.511 100 L
16	1⅓	basso			52.883 325 L
48	4	3	secchio		17.627 775 L
72	72	54	18	inghistara	979.321 mL

At Vicenza

					Metric
botte					911.120 000 L
8	mastello				113.890 000 L
96	12	secchio			9.490 830 L
960	120	10	bozza		949.083 mL
3840	480	40	4	gotto	237.271 mL

37.28.7 Units of Weight

Peso grosso (heavy weights) and *peso sottile* (light weights) at Padua

			Metric	Metric
libbra grossa			486.539 g	338.883 g
12	oncia		40.545 g	28.240 g
72	6	sazo	6.757 g	4.707 g

Peso grosso (heavy weights)^a in Venice

								Metric
migliaio								476.998 kg
10	centinaio or quintale grosso							47.699 8 kg
40	4	miro						11.925 0 kg
1000	100	25	libbra grossa					476.998 7 g
12,000	1200	300	12	oncia				39.750 g
16,000	1600	400	16	1 $\frac{1}{3}$	oncia di zecca			29.812 g
72,000	7200	1800	72	6	4 $\frac{1}{2}$	saggio		6.625 g
2,304,000	230,400	57,600	2304	192	144	32	carato	2.070 g
9,216,000	921,600	230,400	9216	768	576	128	4 grano	51.76 mg

^aFor metals, wool, cotton, raisins and oil*Peso sottile* (light weights)^a use in Venice

								Metric
carica								120.491 880 kg
1 $\frac{1}{13}$	staio corinzio							78.319 720 kg
4	2 $\frac{3}{5}$	centinaio or quintale sottile						30.122 970 kg
400	260	100	libbra sottile					301.229 70 g
4800	3120	1200	12	oncia				25.108 31 g
38,400	24,960	9600	96	8	dramma			3.138 54 g
115,200	74,880	28,800	288	24	3	scrupolo		1.046 18 g
2,304,000	1,497,600	576,000	5760	480	60	20	grano	52.31 mg

^aFor drugs, soap, cotton, rice, coffee, tea and sugar

In Verona

							Metric
peso							8.332 175 kg
16 $\frac{2}{3}$	libbra grossa						499.930 5 g
25	1 $\frac{1}{2}$	libbra sottile					333.287 g
200	12	8	onca grossa				41.660 875 g
300	18	12	1 $\frac{1}{2}$	onca sottile			27.773 917 g
2400	144	96	12	8	mezzette grossa		3.471 739 g
3600	216	144	18	12	1 $\frac{1}{2}$	mezzette sottile	2.314 493 g

At Vicenza

					Metric
centinaio					48.653 870 kg
16 $\frac{2}{3}$	libra grossa				486.539 g
25	1 $\frac{1}{2}$	libra sottile			338.883 g
200	12	8	onca grossa		40.545 g
300	18	12	1 $\frac{1}{2}$	onca sottile	28.240 g

For silk at Venice

				Metric
libbra				307.440 6 g
12	once			25.620 05 g
72	6	sazo		4.270 01 g

For gold, silver and jewels in Venice and Verona

							Metric
libbra grossa							476.998 700 g
2	marco						238.499 350 g
16	8	once					29.812 419 g
64	32	4	quarto				7.453 105 g
384	192	24	6	denaro			1.242 184 g
2304	1152	144	36	6	carato		207.031 mg
9216	4608	576	144	24	4	grano	51.758 mg

For medical use at Padua, in Venice and Verona

						Metric
libbra sottile						301.229 700 g
12	once					25.102 475 g
96	8	dramme				3.137 809 g
288	24	3	scrupolo			1.045 936 g
5760	480	60	20	grano		52.297 mg

Other reported measures:

1 **libbra de fieno** (for hay at
Vicenza) = 320.812 g.

38 Ivory Coast

See *Côte d'Ivoire*.

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