



Artificial Insemination

Level-I

Learning Guide#24-26

Unit of Competence: Follow Basic

Chemical Safety Rules

Module Title

Following Basic

Chemical Safety Rules



Learning Guide#24

Unit of Competence: Follow Basic

Chemical Safety Rules

Module Title

Following Basic

Chemical Safety Rules

LG Code: AGR ATI1 M08 0919 LO1-LG-24

TTLM Code: AGR ATI1 TTLM 0919 v1

**LO 01: Follow workplace
requirements and instructions
concerning chemicals**

Instruction Sheet	Learning Guide #24
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- ✓ Identifying Roles and Responsibilities of Peoples in work place
- ✓ Recognizing and following Safety Procedure in chemical handling
- ✓ Identifying and Reporting Occupational health and safety
- ✓ Following Organizational Procedures regarding Chemicals

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- ✓ Identify Roles and Responsibilities of Peoples in work place
- ✓ Recognize and following Safety Procedure in chemical handling
- ✓ Identify and Reporting Occupational health and safety
- ✓ Follow Organizational Procedures regarding Chemicals

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” in **page -6, 9, 12 and 14** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 ” in **page -15**.
6. Do the “LAP test” in **page – 16** (if you are ready).



Information Sheet-1

Identifying roles and responsibilities of people in the work place

1. Identifying roles and responsibilities of people in the work place

Safe practice in chemical laboratory is necessary to every individual and the need to follow a set of rules. Safety is a mutual responsibility and requires the desire on the part of individual for self-protection as well as protection of one's associates. With this in mind this Learning guide is prepared to:

- ✓ Inform the responsibility of each individual when he/she is in chemical laboratory.
- ✓ Promote greater awareness of the potential hazards in the laboratory.
- ✓ Encourage the use of safety of safe procedures in the handling of chemicals.
- ✓ Enable laboratory workers to react promptly when accidents do occur.

Some rules are not made to be broken

1) Do not pipette by mouth-ever

You say, "But it is only water." Even if it is, how do you think that glass ware really is? Using disposable pipettes? I know lots of people who rinse them and put them back! Do not pipette by mouth at either.

2) Dress appropriately

No sandals, no clothes you love more than life, no contact lenses, and long pants are preferable to shorts or short skirts. Tie long hairs back, wear safety goggles and a lab coat. Even if you are not clumsy, someone else in the lab probably is. Do not be bad example to others, remembered for all time for something stupid.

3) Identify the safety equipment



And know how to use it! Know the location of fire blanket, extinguishers, eye wash and shower

4) Do not Taste or sniff chemicals

For any chemicals, if you can smell them then you are exposing yourself to a dose that can harm you! Do not taste your experiment.

5) **Do not causally dispose** of chemicals down the drain wash it away rather than risk an unexpected reaction between chemical “left overs” later.

6) Do not eat or drink in a lab

Just do not do it!

7) Do not pay mad Scientist

Do not haphazardly mix chemicals! Pay attention to the order in which chemicals are to be added to other and do not deviate from the instructions.

Responsibility of Instructor or Laboratory Supervisor

Every instructor or laboratory supervisor should:

1. Set a good example by
 - a) observing all rules
 - b) wearing protective equipment where recommended
 - c) being enthusiastic about safety
2. Be alert for unsafe conditions
3. Inspect often and intelligently
4. Maintain discipline and enforce rules
5. Prohibit use of laboratory glassware as food or beverage container.
6. Careful review all experiments for possible safety problems before the experiments are assigned to students.
7. Maintain a life of publications on laboratory safety, readily available to students and others, and encourage its use.
8. Deliver an instruction to the students regarding hazards of the chemicals being used in a particular course and the manner in which these chemicals are to be handled and disposed of safely.



Responsibility of the Students

Each student should:

1. Adhere to all safety rules and participate conscientiously in any training exercises.
2. Be aware of the location of the fire exits, alarms and prompt reporting to the instructors in case any danger occurs.
3. Be aware of the location of fire extinguishers and trained in the proper manner to operate them.
4. Know the location of the nearest safety shower and eye wash and how to operate them
5. Be responsible in taking care of the glassware and other materials he/she is using.

WASTE MATERIALS

1. Clean up as you work, keeping your bench free of chemicals, scraps of paper, and dirty glassware. Discard unwanted solids in a covered solids waste container; use the waste paper container for paper only. Never discard uncontaminated paper with chemical waste, nor discard chemicals or broken glass with waste paper.
A separated container should be available for broken glassware. All containers should be plainly marked.
2. Nonflammable liquids soluble in water may be flushed down the drain unless a special container is for them. Liquids heavier than water should be placed in a special container since they may clog the drain. Only on nonflammable, nontoxic, insoluble liquids should be flushed down the drain. Appreciable quantities (over a liter) of flammable or insoluble liquids should be placed in a special covered labeled container.
3. Waste Mercury, broken mercury thermometers, and all mercury compounds should be placed in a container designed for them and must not be discarded in the sink or in to a vacuum pumps or vacuum system.



4. Waste sodium, other alkali metals, hydrides of alkali metals and phosphorus should be disposed of only as directed. Under no circumstances should such substances be discarded in the sink or in the waste containers other than covered containers labeled and specifically indicated for these materials.
5. Each disposal should be considered separately and a handling, storage and disposal procedure , determined by physical and chemical properties of particular peroxide established.
6. Rinse material clinging to glassware in the laboratory sink, cleaning off any remainder with detergent, hot water, and a brush. Keep bare hands out of wash water. Use cleaning solvents in small amounts, and carefully rinse out any residual vapors
8. Bedding for livestock. **Material Safety Data Sheets (MSDS)** A **Material Safety Data Sheet** (MSDS) (also known as PSDS (Product safety data sheet) or a COSHH data sheet in the United Kingdom) is a form with data regarding the properties of a particular substance.

In some jurisdictions the MSDS is required to state the chemical's risks, safety, and effect on the environment.



Self-Check -1

Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain the Responsibility of Supervisor in Laboratory. (4 points)
2. Explain the Responsibility of students in Laboratory. (4 points)
3. Explain un broken rules in laboratory and during work with chemicals. (4 points)

Note: Satisfactory rating - 5 and 8 points

Unsatisfactory - below 5 and 8 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet 2	Recognizing and following Safety Procedure in chemical handling
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2.1. Recognize Risks associated with chemicals

2.1.1. Instructions for use, maintenance and storage of personal protective equipment and application equipment

a. Personal protective equipment and clothing

Personal protective equipment and clothing may act as a barrier to minimize the risk of exposure to aerosols, splashes and accidental inoculation. The clothing and equipment selected is dependent on the nature of the work performed. Protective clothing should be worn when working in the laboratory. Before leaving the laboratory, protective clothing should be removed, and hands should be washed. **Table 1** summarizes some personal protective equipment used in laboratories and the protection afforded.

b. Laboratory coats, gowns, coveralls, aprons

Laboratory coats should preferably be fully buttoned. However, long-sleeved, back opening gowns or coveralls give better protection than laboratory coats and are preferred in microbiology laboratories and when working at the biological safety cabinet. Aprons may be worn over laboratory coats or gowns where necessary to give further protection against spillage of chemicals or biological materials such as blood or culture fluids. Laundering services should be provided at/near the facility. Laboratory coats, gowns, coveralls, or aprons should not be worn outside the laboratory areas.

c. Goggles, safety spectacles, face shields

The choice of equipment to protect the eyes and face from splashes and impacting objects will depend on the activity performed.

PERSONAL PROTECTIVE EQUIPMENT

EQUIPMENT	HAZARD CORRECTED	SAFETY FEATURES
Laboratory coats gowns, coveralls	Contamination of clothing	<ul style="list-style-type: none"> • Back opening • Cover street clothing



Plastic aprons	Contamination of clothing	<ul style="list-style-type: none"> • Waterproof
Footwear	Impact and splash	<ul style="list-style-type: none"> • Closed-toe
Goggles	Impact and splash	<ul style="list-style-type: none"> • Impact-resistant lenses (must be optically correct) • Side shields
Face shields	Impact and splash	<ul style="list-style-type: none"> • Shield entire face • Easily removable in case of accident
Respirators	Inhalation of aerosols	<ul style="list-style-type: none"> • Designs available include single-use disposable; full-face or half-face air purifying; full-face or hooded powered air purifying (PAPR); and supplied air respirators
Gloves	Direct contact with microorganisms Cuts	<ul style="list-style-type: none"> • Disposable microbiologically approved latex, vinyl or nitrile Hand protection • Mesh

EQUIPMENT HAZARD CORRECTED SAFETY FEATURE

a. Eye protection

Prescription or plain eye glasses can be manufactured with special frames that allow lenses to be placed in frame from the front, using shatterproof material either curved or fitted with side shields (safety glasses). Safety spectacles do not provide for adequate splash protection even when side shields are worn with them. Goggles for splash and impact protection should be worn over normal prescription eye glasses and contact lenses (which do not provide protection against biological or chemical hazards). Face shields (visors) are made of shatterproof plastic, fit over the face and are held in place by head straps or caps. Goggles, safety spectacles, or face shields should not be worn outside the laboratory areas.



b. Respirators

Respiratory protection may be used when carrying out high-hazard procedures (e.g. cleaning up a spill of infectious material). The choice of respirator will depend on the type of hazard(s). Respirators are available with interchangeable filters for protection against gases, vapours, particulates and microorganisms. It is imperative that the filter is fitted in the correct type of respirator. To achieve optimal protection, respirators should be individually fitted to the operator's face and tested. Fully self-contained respirators with an integral air supply provide full protection. Advice should be sought from a suitably qualified person, e.g. an occupational hygienist, for selection of the correct respirator. Surgical type masks are designed solely for patient protection and do not provide respiratory protection to workers. Some single-use disposable respirators (ISO 13.340.30) have been designed for protection against exposures to biological agents. Respirators should not be worn outside the laboratory areas.

c. Gloves

Contamination of hands may occur when laboratory procedures are performed. Hands are also vulnerable to "sharps" injuries. Disposable microbiologically approved latex, vinyl or nitrile surgical-type gloves are used widely for general laboratory work, and for handling infectious agents and blood and body fluids. Reusable gloves may also be used but attention must be given to their correct washing, removal, cleaning and disinfection. Gloves should be removed and hands thoroughly washed after handling infectious materials, working in a biological safety cabinet and before leaving the laboratory. Used disposable gloves should be discarded with infected laboratory wastes.

Allergic reactions such as dermatitis and immediate hypersensitivity have been reported in laboratory and other workers wearing latex gloves, particularly those with powder. Alternatives to powdered latex gloves should be available.

➤ Standard Operating Procedures

What are SOPs?

SOP stands for "standard operating procedure". SOPs are powerful tools for seizing control of work procedures. In fact, they can really make the difference between



success and failure in today's dairy economy. Why? Because SOPs are effective communication tools that contribute to both worker understanding and job satisfaction.

Objectives of SOPs

The objectives of SOPs are to:

- Provide direction
- Improve communication
- Reduce training time
- Reduce variation



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain some of the Personal protective equipment's used during chemical handling . (4 points)
2. What is the objectives of SOPs (4 points)

Note: Satisfactory rating - 5 and 8 points

Unsatisfactory - below 5 and 8 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet 3

OHS requirements & identifying OHS hazards

3. OHS requirements & identifying OHS hazards

3.1. Workplace OHS policies:-

Workplace OHS policies are usually a statement about a safety issue in the workplace, and what the organization intends to do about the issue.

Examples of common OHS policies include:

- non-smoking policy
- policy on the use of drugs and alcohol
- Health and safety policy.
- OHS policies should be available to everyone at a workplace. You are likely to find

Policies displayed on a notice board at the workplace, in a training manual, or as part of an organization's Website.

3.2. Workplace OHS procedures:-

Workplace OHS Procedures are step-by-step, or sets of instructions on how to deal with an activity in the workplace.

Three common OHS procedures are:

- emergency procedures
- first aid procedures
- Accident/near miss and hazard reporting procedures.

3.3. Emergency procedures

Every workplace should have procedures to deal with emergencies.

Emergencies may include:

- Fire
- chemical spill



- explosion or gas leak
- bomb threat
- flooding
- Armed hold-up.

3.4. OHS Requirements

In laboratory and during chemical handling it is required to take all practicable steps to ensure that no work activity carried out by her/him, or procedure used, will cause or be a source of harm to the visiting employer's employees, contractor's employees, or self-employed contractor (person), including subcontractors, while they are accessing, leaving, or in the area they are required to work. In taking all practicable steps to ensure that hazards arising from work, or work activities will not cause harm, the farmer or landowner may need to provide information, instructions or warning signs to alert people to known hazards, e.g. weight limits for access bridges, presence of unruly animals, use of pesticides, etc.

Work Environment

- ❖ Ensure that workplace safety inspections are routinely conducted by a person who can identify hazards and conditions that are dangerous to workers

E.g. obstructions in the aisle, blind corners and intersections, and forklifts that comes too close to workers on foot

- ❖ Install the workstations, control panel, and equipment away from the aisle when possible
- ❖ Do not store bins, racks, or other materials at corners, intersections, or other locations that obstruct the view of operators or workers at workstations
- ❖ Enforce safe driving practices such as obeying speed limits, stopping at stop signs, and slowing down and blowing the horn at intersections
- ❖ Repair and maintain cracks, crumbling edges, and other defects on loading docks, aisles, and other operating surfaces



The general duties of employers under the Health and Safety in Employment are to take all practicable steps to:

- Provide and maintain a safe working environment;
- Include employees in the development of health and safety procedures;
- Hazard identification and control);
- Provide and maintain facilities for the safety and health of employees;
- Ensure that any machinery or plant that employees use is safe;
- Ensure that any processes that employees are involved in will not adversely affect their health or safety;
- Provide employees with information on workplace hazards, and ensure that employees are trained and supervised;
- Record and investigate workplace accidents and illness, and report any that constitute serious harm; and
- Develop procedures to deal with emergencies which may arise at work



Self-Check -3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain Some common OHS Polices (4 points)

Note: Satisfactory rating - 4 points Unsatisfactory - below 4 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information Sheet-4

Following Organizational Procedures regarding Chemicals

4.1. Following The organizational Procedure

1. Keep your hands and face clean. Wash thoroughly with soap and warm water whenever a chemical contacts your skin.
2. Most chemicals are harmful to some degree. Avoid direct contact with any chemical. Some substances considered to be safe today may in future be found to cause unsuspected long-term disorder.
3. Never taste or smell a chemical unless specifically directed to do so.
4. Carefully read label before removing a reagent from its container. Read it again as you promptly recap the container and return it to its proper location. Names of distinctly different substances are sometimes nearly alike and using the wrong substances can lead to accidents.
5. A large number of common substances are acute respiratory hazards and should not be used in a confined area in large amounts. They should be dispensed and handled only where there is adequate ventilation, preferably in a hood.
6. Some solvents may serve as vehicles for the rapid transport of toxic substances dissolved in them through the skin in to the body.
7. Anyone who swallows a chemical should be encourage to drink large amounts of water and immediately seek medical assistance.
8. All containers of chemical must be labeled clearly. Do not use any substance in an unlabeled container.
9. Wear an apron and gloves whenever pouring bromine, hydrofluoric acid, or related materials in the fume hood. Contact with these types of materials will lead to painful burns.
10. Always add a reagent slowly. Observe what takes place when the first small amount is added and wait a few moments before adding more; some reaction take time to start. If an expected reaction does not initiate, ask you instructor for advice before adding more reagent.



11. To avoid violent reaction while diluting solutions, always pour concentrated solution slowly in to water or in to less concentrated solution while stirring. The more concentrated solution is usually heavier and any heat evolved is better distributed. This procedure is particularly applicable in preparing dilute solutions.
12. Never look down the opening of a vessel unless it is empty.
13. Most ether, including cyclic ethers, form dangerously explosive peroxides on exposure to air and light.

4.2. Employers to ensure safety of employees

Every employer shall take all practicable steps to ensure the safety of employees while at work; and in particular shall take all practicable steps to

Ensure that while at work employees are not exposed to hazards arising out of the arrangement, disposal, manipulation, organization, processing, storage, transport, working, or use of things—

- (i) In their place of work; or
- (ii) Near their place of work and under the employer's control; and

Electrical safety

The electrical wiring and fittings of machinery connected to the mains supply (or similar) must comply with the Electricity Regulations. All portable or hand-held machinery that derives power from an electrical current should be used with an isolating transformer or residual current device properly connected. Specific guidance on the suitable types and use of these devices should be sought from the appropriate electrical supply authority or from an electrical inspector

Hazard identification and control

Managing health and safety effectively begins with identification of the actual and potential hazards that can harm people in the place of work. Once identified, the significant hazards should be appropriately controlled. The Health and Safety in



Employment Act 1992 requires employers, with the involvement of their employees, to identify and control hazards.

Once the hazards are identified, the following steps should be taken:

- The first attempt should be to eliminate or remove the hazard.(An example of elimination is the substitution of a hazardous chemical with a non-hazardous chemical.)
- If it is not practical to eliminate the hazard, then employees should be isolated from the hazard. An example of isolation is machinery guarding which isolates people from the hazardous parts of the machine (the hazard has not been eliminated by the provision of a guard because it is still there behind the guard).
- If it is not practical to do either of these things then the effects of the hazard on the employees in the place of work should be minimized. This in effect means doing everything else practicable to make the work safe, and may include:
 - Providing and ensuring the use of protective equipment and clothing;
 - Monitoring employees' exposure to the hazard;
 - With the employees' informed consent, monitoring their health;
 - Providing the employees with the results of the monitoring of their health; and
 - Providing employees with results relating to the monitoring of the place of work.

Prevention of falls from heights

Employers should take all practical steps to ensure that where a fall from 3 metres is possible that fencing or other means are provided to help prevent a fall. This will be practical in relation to most man-made structures. It is recognized that it is not usually practical to fence natural hazards and that employers and employees should take due care in situations where falls can occur.



Self-Check -1

Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Hazard elimination is possible in work place. (true/False)(4 points)

Note: Satisfactory rating - 5 and 8 points

Unsatisfactory - below 5 and 8 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Learning Guide #25

Unit of Competence: Follow Basic

Chemical Safety Rules

Module Title

Following Basic

Chemical Safety Rules

LG Code: [AGR ATI1 M08 0919 LO1-LG-25](#)

TTLM Code: AGR ATI1 TTLM 0919 v1

LO 01: Recognize risks associated with chemicals

Instruction Sheet	Learning Guide #25
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –



- ✓ Recognizing Functions of Chemicals in work places
- ✓ Recognizing and identifying Chemical symbols and labels
- ✓ Identifying Chemical storage location
- ✓ Recognizing and Observing Chemical transport, handling and storage
- ✓ Identifying and observing use, Maintenance and storage of PPE
- ✓ Identifying and observing application equipment's

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- ✓ Recognize Functions of Chemicals in work places
- ✓ Recognize and identifying Chemical symbols and labels
- ✓ Identify Chemical storage location
- ✓ Recognize and Observing Chemical transport, handling and storage
- ✓ Identify and observing use, Maintenance and storage of PPE
- ✓ Identify and observing application equipment's

Learning Instructions:

7. Read the specific objectives of this Learning Guide.
8. Follow the instructions described below 3 to 6.
9. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
10. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” **in page -6, 9, 12 and 14** respectively.
11. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 ” **in page -15**.
12. Do the “LAP test” **in page – 16** (if you are ready).

Information Sheet-1	Recognizing Functions of Chemicals in work places
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1. Recognizing Agrichemicals

Agrichemicals are used every day in forestry work. Most at risk are those involved in applying them. Every individual may react differently to contact with any particular agrichemical. This guide sets out examples of hazards to users of agrichemicals in forestry workplaces and some steps to control any risk. It is intended not only for workers but also for employers, supervisors and forest owners — who should ensure that anyone coming into contact with agrichemicals is well aware of the potential for injury or ill health and knows how to avoid the hazards. Although this guide focuses on the application of agrichemicals using hand sprayers, its principles also apply to the application of agrichemicals from the air and in forest nurseries.

Responsibilities

If you are an employee....

As an employee you are responsible for ensuring that your actions or inaction do not endanger yourself, your co-workers, or members of the public. This includes being aware of your responsibilities for preventing accidents, injuries and illness. You are required to report all situations — including unsafe acts and conditions — that are a hazard to you, your co-workers, or others. You also have a responsibility to report all hazards you encounter or are aware of. This includes any health conditions which could be affected by spraying, such as asthma or a skin allergy. Where appropriate, your employer is responsible for correcting these hazards or ensuring safe procedures are used to deal with them.

Safety programme

Every employer should have a Health and Safety Management Plan. The written plan will outline what is required for ensuring workplace safety. It must include information on:

- Required worker training and supervision;
- Information to employees;
- Safety inspections;
- Accident investigation and injury reporting;



- Safety meetings
- Hazard identification and control; and
- Emergency procedures.

If you are an employee, you should ask to see a copy of your employer's safety programme and become familiar with its contents

To be competent at using agrichemicals in forestry work, employers and employees must:

- Understand the techniques of doing the job.
- Identify the hazards and be able to minimize or eliminate them.
- Know the responsibilities, rules, standards and regulations which must be met in the job.

Chemical hazards

You must know what sort of chemical you are applying and its potential harmful effects. Many different agrichemicals are used in forestry. Each is "scheduled" or rated according to the hazard it poses to the person handling it. The most dangerous class of chemicals are rated Class 1: "Deadly Poison". These are followed by Class 2: "Dangerous Poison" then Class 3: "Poison". The fourth rating of chemicals are rated Class 4: "Caution". Chemicals with an even lower hazard are rated Class 5: "Unclassified". With the exception of paraquat (dangerous poison), Reglone, 2,4-D, Grazon and Tordon Brushkiller (poison), most agrichemicals used in forestry either have a "caution" rating or are "unclassified". All agrichemicals should be treated as being potentially poisonous. Even agrichemicals rated as very low in toxicity can be a health hazard. They may cause irritation if breathed in, irritation to eyes, and some may cause skin irritation. The label on the agrichemical should warn you about the hazard it poses and the precautions you need to take — read it. Do not take more agrichemical to the workplace than is required to do the day's work. Store the agrichemical in accordance with the label recommendations in a suitable store.

Do not store chemicals which have been mixed.



The most important rule is:

Always read the label on the container. Make sure you know what you are using and its effects.

If you can't understand the label, don't use the agrichemical.

Remember, your employer or supervisor has a responsibility under the Health and Safety in Employment Act to make sure that this information is clear to you and any other employee affected.

It's your right to know.

The label will tell you what the minimum protective clothing is for the job as well as storage container disposal and emergency procedures.

Follow the label directions. The agrichemical user should have at least the minimum of skin protection, including waterproof boots, gloves, long-sleeve overalls and head covering. Even if protective clothing is not specified on the label, protection will be needed to reduce the risk of exposure.

Material safety data sheets

Another common way of providing information about a chemical product is the Material Safety

Data Sheet (MSDS).

A Material Safety Data Sheet (MSDS) on the agrichemical being used should be made readily available to you on request. The principal should have this.

Mixing chemicals

When diluting sprays from a concentrate or mixing agrichemicals, you should wear eye protection and a full waterproof apron as well. It is important that the person mixing the spray is accurate in measuring out and diluting agrichemicals. Take care when pouring liquids — use eye protection.

When opening bags of powders, use a knife — don't tear at the bag.

Mix agrichemicals as directed, using calibrated equipment. Keep the mixing area away from eating and washing-up areas.

Clothing and equipment



Spray equipment must be well maintained and not leak. This is most important when knapsack spraying. Agrichemicals may leak on to your back and be taken in through the skin during the course of the working day. Carry a spare nozzle and a nozzle cleaning brush to fix blockages safely.

Protective clothing must be properly selected and cared for.

Change out of wet or contaminated clothing at work before travelling home. Do not wash these

Clothes with other washing — wash them separately and store protective clothing separately from agrichemicals. Keep bare skin covered with freshly washed clothing. This should preferably be made from a breathable fabric, such as cotton. Chemicals are more readily absorbed through the skin when a

Person is hot and sweating. Gloves should be checked daily to make sure that they are in good condition. Spare gloves should be available on site. Start each day with clean protective clothing. Boots should be checked to ensure that they are not letting chemical through cuts.

Respirators need special cleaning care. Read the manufacturer's instructions for replacement of filters.

Washing facilities

Washing facilities must be provided wherever agrichemicals are being handled, mixed or applied; the employer in charge of the operation must provide sufficient water for the crew to wash up at least twice a day.

Know where the clean water is to wash any chemical off if you need to.

Water used for drinking must be clearly identified and kept separate from water used for washing in or mixing.

Washing facilities may include a shower if the manufacturer's instructions require one.

Wash yourself and your equipment at the end of each day's spraying.

Always wash your hands before eating or smoking

Spills and emergencies

Each employee must know the emergency procedures for different situations that may arise. If chemical splashes into your eye, flush with clean water for at least 15 minutes.



Then go to a doctor. Don't add anything to the water you use for flushing a contaminated eye. If chemical is accidentally swallowed, different chemicals are treated differently — read the label. You should know what to do if there is a serious chemical spill. This could happen following a vehicle accident on the way to the site.

Know the emergency procedures.

Signs of chemical poisoning vary and may include any of:

- Headache;
- Blurred vision;
- Chest pains;
- Vomiting;
- Giddiness;
- Nausea.

Always be alert for any of these signs. Even small quantities of agrichemicals taken into the body over the course of a day can become harmful when you are doing spraying over several weeks.

Remember: Everyone reacts differently to different chemicals.

Avoid spraying onto yourself, other workers and non-target areas.

Safety Rules

General Precautions

Follow all instructions. Never perform activities without the approval and supervision of your teacher. Do not engage in horseplay. Never eat or drink in the laboratory. Keep work areas clean and uncluttered.

Dress Code

Wear safety goggles whenever you work with chemicals, glassware, heat sources such as burners, or any substance that might get into your eyes. If you wear contact lenses, notify your teacher. Wear a lab apron or coat whenever you work with corrosive chemicals or substances that can stain. Wear disposable plastic gloves when working with organisms and harmful chemicals. Tie back long hair. Remove or tie back any



article of clothing or jewelry that can hang down and touch chemicals, flames, or equipment. Roll up long sleeves. Never wear open shoes or sandals.

First Aid

Report all accidents, injuries, or fires to your teacher, no matter how minor. Be aware of the location of the first-aid kit, emergency equipment such as the fire extinguisher and fire blanket, and the nearest telephone. Know whom to contact in an emergency.

Heating and Fire Safety

Keep all combustible materials away from flames. When heating a substance in a test tube, make sure that the mouth of the tube is not pointed at you or anyone else. Never heat a liquid in a closed container. Use an oven mitt to pick up a container that has been heated.

Using Chemicals Safely

Never put your face near the mouth of a container that holds chemicals. Never touch, taste, or smell a chemical unless your teacher tells you to. Use only those chemicals needed in the activity. Keep all containers closed when chemicals are not being used. Pour all chemicals over the sink or a container, not over your work surface. Dispose of excess chemicals as instructed by your teacher. Be extra careful when working with acids or bases. When mixing an acid and water, always pour the water into the container first and then add the acid to the water. Never pour water into an acid. Wash chemical spills and splashes immediately with plenty of water.

Using Glassware Safely

If glassware is broken or chipped, notify your teacher immediately. Never handle broken or chipped glass with your bare hands. Never force glass tubing or thermometers into a rubber stopper or rubber tubing. Have your teacher insert the glass tubing or thermometer if required for an activity.

Using Sharp Instruments

Handle sharp instruments with extreme care. Never cut material toward you; cut away from you.

End-of-Experiment Rules



Unplug all electrical equipment. Clean up your work area. Dispose of waste materials as instructed by your teacher. Wash your hands after every experiment.

Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain the Personal protective equipment's . (4 points)
2. What is the objectives of SOPs (4 points)

Note: Satisfactory rating - 5 and 8 points

Unsatisfactory - below 5 and 8 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet -2

Recognizing and identifying Chemical symbols and labels



2. Chemical labels and symbols

A label will tell

- The name of the chemical—common name, chemical name, or both. If the substance contains more than one chemical, they'll all be listed unless they are a "trade secret".
- The name, address, and emergency telephone number of the company that manufactured or imported the chemical.
- The chemical's physical hazards—what could happen if the chemical is not handled properly. Is it flammable or combustible? explosive? Is it reactive? radioactive?
- The chemical's health hazards, or possible health problems that could result from overexposure. Some of the terms that describe health hazards are carcinogen (causes cancer), highly toxic (poisonous) agent, toxic agent, reproductive hazard, irritant (temporarily inflames tissue), corrosive (destroys tissue), sensitizer (causes an allergic reaction after repeated exposure), hepatotoxin (produces liver problems), nephrotoxin (damages kidneys), and neurotoxin (causes nervous system problems).
- Some labels also include important information such as storage and handling instructions. This could include such information as "use only in well-ventilated areas" or "store in tightly closed containers".
- Basic protective clothing, equipment, and procedures that should be used to work safely with the chemical might also be listed. **These might include "avoid contact with skin," "use eye protection," etc.**

Words, Pictures, Symbols

Special signal words are used on many labels to quickly tell how dangerous the chemical could be. Common signal words and their meanings are: **Danger:** can cause immediate serious injury or death. It may refer to a substance that is extremely flammable, corrosive, or toxic.



Warning: can cause potentially serious injury or death.

Caution: can cause potentially moderate injury.

Special Symbols

Special symbols are also used on many labels to depict the kinds of hazards the chemical could present. These symbols appear on labels of containers that have been shipped by truck, rail, or air: the skull-and-crossbones symbol for poison, used to identify toxic substances; flames to indicate flammability; an object blowing apart to warn of explosion danger; and a drip that eats away at a hand or an object to warn of corrosion.

Information sheet -3	Identifying Chemical storage location
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Chemical storage locations Chemicals and their containers must be stored only in facilities approved by the Area Safety and Health Manager and where consideration has been given to the hazardous nature of the pesticides, potential environmental damages, and adequate personal safety and security systems in and around the storage site. Storage sites shall be selected according to the following criteria: Where flooding is unlikely; Where easily accessible by firefighting equipment; Located away from any public building or activity so that if an emergency spillage, fire, or explosion occurs, it would not cause harm to the general population; Located a safe distance away from any potable water supply, streams, lakes, or drainage canals that discharge to water supplies; and Not stored in any facility used primarily as food/feed/fertilizer/seed storage or processing centers.

Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain the Personal protective equipment's . (4 points)



2. What is the objectives of SOPs (4 points)

Note: Satisfactory rating - 5 and 8 points

Unsatisfactory - below 5 and 8 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

Information sheet -4	Recognizing and Observing Chemical transport, handling and storage
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Safe driving: load and unloading

Loading and unloading can be dangerous. Machinery can seriously hurt people.

Heavy loads, moving or over turning vehicles and working at height can a lead to

`injuries death

This guidance should be followed to help avoid problems

Guidance

Loading and unloading areas should be :-



- Clear of other traffic, pedestrians and people not involved in loading and unloading
- Clear of over head electric cables so there no chance touching them, or electricity jumping to earth through machinery, loads or people
- To maintain stability trailers should be packed on firm level ground
- Loads should be spread as evenly as possible, during both loading and unloading. Un even loads can make the vehicle or trailer unstable
- Load should be secured or arranged so that they do not slide around racking may help stability
- Safety equipment must be considered. Mechanical equipment and heavy moving loads are dangerous
- Gauds or skirting place may be necessary if there is a risk of anything being caught in machinery (e.g dock levelers or traffic tail lifts). There may other mechanical dangers and safety procedure to be considered.
- Ensure the vehicles or trailer its brakes applied and all stabilizers are used. The vehicle should be as stable as possible
- In some workplaces it may be possible to install a harness system to protect people working at height provide a safe place where drivers can wait of they are not involved Drivers should not remain in their cabs if this can be avoided No-one should be in the loading/unloading area if they are not needed.
- Vehicles must never be overloaded Over loaded vehicles can become unstable, difficult to steer or be less able to brake.
- Always check the floor or deck to the loading area before loading to make sure it is safe look out for debris, broken boarding, etc.
- Loading should allow for safe unloading.
- Loads must be suitably packaged. When pallets are used. The driver needs to check that.
 - ✚ They are in good condition
 - ✚ Loads are properly secured to them.



- ✚ Loads are safe on the vehicle. They may need to be securely attached to make sure they cannot fall off.

Transporting, handling and storage of chemicals

- Have bulk chemicals delivered to the farm wherever possible.
- Do not transport chemicals in the passenger area or a boot of a vehicle.
- If transporting chemicals in the back of a ute, use secure containers and tie them down.
- When not in use, store all chemicals in locked, purpose-built chemical store. Chemical storage should provide spill containment and be well ventilated.
- If the yards are away from the main chemical store, use a lockable cupboard or steel locker with spill containment. Do not leave chemicals in the open.
- Children should not be able to access chemicals at any time.
- Keep veterinary chemicals requiring refrigeration in a separate refrigerator from that used for food and drinks (for example, a small, lockable bar-type fridge). Do not use a large lockable fridge as there have been a number of incidents involving children being locked in fridges.
- Return chemicals, including drenches, to the locked store after use.



Forklift Safety

Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain the Personal protective equipment's . (4 points)
2. What is the objectives of SOPs (4 points)



Note: Satisfactory rating - 5 and 8 points

Unsatisfactory - below 5 and 8 points

You can ask your teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

Information Sheet 5	Identifying and observing use, Maintenance and storage of PPE
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PPE and application equipment

Ventilation requirements: Ventilate via mechanical methods (general or local exhaust) to maintain exposure below TLV(s), if applicable. Good industrial hygiene practice dictates that indoor work areas should be isolated and provided with adequate local exhaust ventilation.

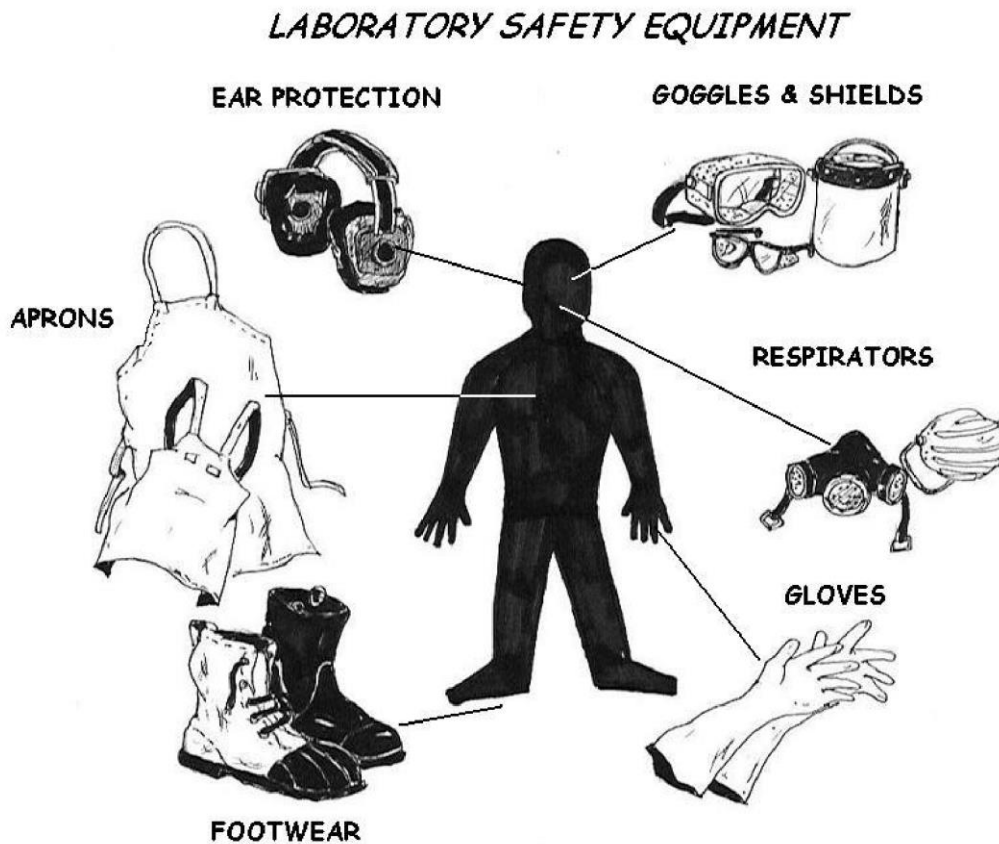
Respiratory: None normally required if good ventilation is maintained. If mist is generated during application process, use a disposable mist respirator.

Eye: Wear chemical splash goggles and/or face shield during mixing and when exposed to mist.

Gloves: Wear rubber gloves when handling, using, or applying this product. Special precautions should be taken to ensure that material cannot get inside gloves.

Other protective equipment: None normally required. Use as necessary to prevent exposure.

Safety showers and eyewash stations should be provided in all areas in which this product is stored and/or handled. Persons exposed routinely to this material should shower prior to leaving work each day. Work clothing should be changed daily.





Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain the Personal protective equipment's . (4 points)
2. What is the objectives of SOPs (4 points)

Note: Satisfactory rating - 5 and 8 points

Unsatisfactory - below 5 and 8 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions



Learning Guide #26

Unit of Competence: Follow Basic

Chemical Safety Rules

Module Title

Following Basic

Chemical Safety Rules

LG Code: [AGR ATI1 M08 0919 LO1-LG-26](#)

TTLM Code: **AGR ATI1 TTLM 0919 v1**

LO 03: Follow chemical handling and storage rules



Instruction Sheet	Learning Guide #-26
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- ✓ Following labels on chemical handling and storage
- ✓ Following safety rules when working and chemical storages
- ✓ Obtaining and using appropriate Personal Protective equipments
- ✓ Following Procedures in accident or spillage events

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- ✓ Follow labels on chemical handling and storage
- ✓ Follow safety rules when working and chemical storages
- ✓ Obtain and use appropriate Personal Protective equipments
- ✓ Follow Procedures in accident or spillage events

Learning Instructions:

13. Read the specific objectives of this Learning Guide.
14. Follow the instructions described below 3 to 6.
15. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
16. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” in **page -6, 9, 12 and 14** respectively.
17. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 ” in **page -15**.
18. Do the “LAP test” in **page – 16** (if you are ready).



Information Sheet-1

Following labels on chemical handling and storage

1. General Chemical Safety Rules Classification of hazardous chemicals

Chemicals may be corrosive, toxic or harmful by inhalation, skin absorption or ingestion. Below are some hazardous chemicals commonly used in the laboratory and the appropriate precautions outlined.

Safety Data Sheet (SDS) contain information necessary for the safe handling of hazardous or potentially hazardous chemicals. Some examples of the types of information provided by an SDS for a chemical include the:

- Product name
- Chemical name
- Formula
- Physical and chemical properties
- Hazard identification -types of hazard(s) posed by the chemical, adverse health effects and symptoms of overexposure.

Basic Chemical Safe Handling Tips

- Read the label.
- Dress the part. Wear the proper safety protection, clothing and equipment as required.
- Know emergency procedures.
- Be careful! Don't work alone; make sure there is someone there to help you if necessary. Don't try to hurry or take shortcuts, you just can't rush safety! Don't roughhouse or goof around. Chemical safety is a job for professionals.
- Report any suspected problems.
- Keep your work area neat, clean and organized. You'll know where everything is, and you'll be able to work more efficiently.
- Store everything properly.



Information sheet 2	Following safety rules when working and chemical storages
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GENERAL GUIDELINES

1. Conduct yourself in a responsible manner at all times in the laboratory.
2. Follow all written and verbal instructions carefully. If you do not understand a direction or part of a procedure, ASK YOUR TEACHER BEFORE PROCEEDING WITH THE ACTIVITY.
3. Never work alone in the laboratory. No student may work in the science classroom without the presence of the teacher.
4. When first entering a science room, do not touch any equipment, chemicals, or other materials in the laboratory area until you are instructed to do so.
5. Perform only those experiments authorized by your teacher. Carefully follow all instructions, both written and oral. Unauthorized experiments are not allowed.
6. Do not eat food, drink beverages, or chew gum in the laboratory. Do not use laboratory glassware as containers for food or beverages.
7. Be prepared for you're with chemicals. Read all procedures thoroughly before using chemicals. Horseplay, practical jokes, and pranks are dangerous and prohibited.
8. Always work in a well-ventilated area.
9. Observe good housekeeping practices. Work areas should be kept clean and tidy at all times.
10. Be alert and proceed with caution at all. Notify immediately of any unsafe conditions you observe.



11. Dispose of all chemical waste properly. Never mix chemicals in sink drains. Sinks are to be used only for water. Check with your teacher for disposal of chemicals and solutions.

12. Labels and equipment instructions must be read carefully before use. Set up and use the equipment as directed by your teacher.

13. Keep hands away from face, eyes, mouth, and body while using chemicals or lab equipment. Wash your hands with soap and water after performing all experiments.

14. Experiments must be personally monitored at all times. Do not wander around the room, distract other students, startle other students or interfere with the laboratory experiments of others.

15. Know the locations and operating procedures of all safety equipment including: first aid kit(s), and fire extinguisher. Know where the fire alarm and the exits are located.

16. Know what to do if there is a fire drill during a laboratory period; containers must be closed, and any electrical equipment turned off.

CLOTHING

17. Any time chemicals, heat, or glassware are used, students will wear safety goggles. NO EXCEPTIONS TO THIS RULE!

18. Contact lenses may be not be worn in the laboratory.

19. Dress properly during a laboratory activity. Long hair, dangling jewelry, and loose or baggy clothing are a hazard in the laboratory. Long hair must be tied back, and dangling jewelry and baggy clothing must be secured. Shoes must completely cover the foot. No sandals allowed on lab days.

20. A lab coat or smock should be worn during laboratory experiments.

ACCIDENTS AND INJURIES

21. Report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the teacher immediately, no matter how trivial it seems. Do not panic.



22. If you or your lab partner is hurt, immediately (and loudly) yell out the teacher's name to get the teacher's attention. Do not panic.

23. If a chemical should splash in your eye(s) or on your skin, immediately flush with running water for at least 20 minutes. Immediately (and loudly) yell out the teacher's name to get the teacher's attention.

24. All chemicals in the laboratory are to be considered dangerous. Avoid handling chemicals with fingers. Always use a tweezer. When making an observation, keep at least 1 foot away from the specimen. Do not taste, or smell any chemicals.

25. Check the label on all chemical bottles twice before removing any of the contents. Take only as much chemical as you need.

26. Never return unused chemicals to their original container.

27. Never remove chemicals or other materials from the laboratory area

28. Never handle broken glass with your bare hands. Use a brush and dustpan to clean up broken glass. Place broken **glass** in the designated glass disposal container.

29. Examine glassware before each use. Never use chipped, cracked, or dirty glassware.

30. If you do not understand how to use a piece of equipment, ASK THE TEACHER FOR HELP!

31. Do not immerse hot glassware in cold water. The glassware may shatter.

32. Do not operate a hot plate by yourself. Take care that hair, clothing, and hands are a safe distance from the hot plate at all times. Use of hot plate is only allowed in the presence of the teacher.



33. Heated glassware remains very hot for a long time. They should be set aside in a designated place to cool, and picked up with caution. Use tongs or heat protective gloves if necessary.

34. Never look into a container that is being heated.

35. Do not place hot apparatus directly on the laboratory desk. Always use an insulated pad. Allow plenty of time for hot apparatus to cool before touching it.

Information sheet 3	Obtaining and using appropriate Personal Protective equipments
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Information sheet 4	Following Procedures in accident or spillage events
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4.1 Chemical handling and storage labels

The following measures should be observed when handling hazardous chemicals:

Care should be taken in selecting protective equipment to ensure that it is fitting and appropriate for protection, against the hazardous chemical

Work area involving hazardous chemicals should be clearly designated and labeled. All work surfaces should be covered with stainless steel or plastic trays, dry absorbent plastic-backed paper or other impervious material in order to contain any spills.

Procedures that involve volatile chemicals or may result in the release of airborne contaminants should be performed in a chemical fume cupboard. This includes the weighing of hazardous chemicals.








Hands must be thoroughly washed after any contact with chemicals.

Labeling of Chemicals

The Globally Harmonised System of Classification and Labeling of Chemicals (GHS) is a United Nations (UN)-developed system for chemical classification

and hazard communication through harmonized provisions for standardized labels and safety data sheets (SDS). The GHS is essentially a hazard communication system for identifying and conveying chemical hazards, and for providing information related to chemical hazards and their control and prevention.

The GHS requires chemicals to be classified based on their inherent properties or hazards and in accordance with certain classification criteria. The classified chemicals are assigned to a fixed set of GHS pictogram(s), signal word, hazard and precautionary statements.

Explosive Self-Reactive Organic Peroxides		Flammables Self-Reactive Pyrophorics Self-Heating Emits Flammable Gas		Oxidizers Organic Peroxides	
Corrosives		Carcinogen Respiratory Sensitizer Reproductive Toxicity Target Organ Toxicity Mutagenicity Aspiration hazard		Environmental Toxicity	
Gases under Pressure		Acute Toxicity (severe)		Irritant Dermal/Skin Sensitizers Acute Toxicity(harmful) Transient target organ effects (narcotic or respiratory)	

4.2 Safety rules for chemicals storage



Good housekeeping, regular inspection as well as clear and exact labeling are essential for minimizing accidents resulting from the storage of chemicals. The following precautions should be closely observed when storing chemicals:

- Chemicals should be stored in a cool and well-ventilated place. Hazardous chemicals should be stored for easy access by lab staff. It is not advisable to store chemicals on high shelves.
- Chemical stores should be examined regularly and checked for its expiry date. Chemicals that show signs of deterioration or are redundant must be disposed of according to established procedures.
- Chemicals should be stored according to hazard classification (for example, oxidising, flammable, corrosive and explosive) rather than according to alphabetical order. Incompatible classes of chemicals must be physically separated from each other, for example, by placing them on different shelves or by using a secondary container.

Flammable chemicals

Flammable solids must be kept dry or in suitable "immersion" liquids. For example, sodium in paraffin and phosphorus in water. Sodium perchlorate is unstable and potentially explosive when it comes into contact with combustible materials. These flammable solids should be clearly labeled

Flammable chemicals should not be stored on open shelves but should instead be stored in a place where there is no likelihood of ignition from a naked flame. It is advisable to store flammable chemicals in a fire resistant metal cabinet provided. Flammable chemicals should never be left exposed.

Flammable liquids (for example, alcohol, diethyl ether and propanone) should be stored in a cool place away from heat sources and direct sunlight. Their containers should not be completely filled.

Highly flammable volatile liquids must be labeled "HIGHLY FLAMMABLE" and **should not be stored in refrigerators** because vapor from flammable liquids may potentially ignite due to electrical sparks from the refrigerator.



Unstable chemicals

Unstable chemicals should be stored in a fire resistant metal cabinet, away from heat and moisture, and regularly inspected. It is always advisable to **keep only a minimum amount that is sufficient for current use**. Two examples of unstable chemicals are chlorates and peroxides

Moisture-absorbing chemicals

Chemicals which readily absorb moisture must be kept in tightly sealed containers or desiccators. Some examples are, aluminum chloride, calcium chloride, phosphorus chloride, phosphorus oxide, sodium peroxide and thionyl chloride

Acids and alkalis

Main stocks of concentrated sulphuric, nitric and hydrochloric acids, ammonia, and inflammable liquids should be stored in the corrosive cabinet or as near to floor level as possible.

Compatible hazard classes of chemicals

Incompatible chemicals refer to chemicals that can possibly react violently with each other to produce heat, flammable products or toxic products.

4.3 Procedures in the event of an accident or spillage

Chemical Spills

The range and quantity of hazardous substances used in laboratories require pre-planning to respond safely to chemical spills. **The clean-up of a chemical spill should only be done by knowledgeable and experienced personnel.**

Spill kits with instructions, absorbents, reactants, and protective equipment should be available to clean up minor spills. Solid sodium hydrogen carbonate may be used to contain acid spills **Chemical spill management**



The necessary steps to manage a chemical spill, reducing the potential for injury or damage to the environment, are as followed:

Emergency Spill Response	Non-Emergency Spill Response
<p>Evacuate – Stop work, do not touch any substance, evacuate personnel from the spill area and alert those nearby. Do NOT use elevators/ lifts.</p> <p>Confine – Isolate the spill area</p> <p>Report – Contact the members of the NSSE SC. If necessary, inform the Campus Security.</p> <p>Secure – Block off the areas leading to the spill until the arrival of the emergency response personnel.</p> <p>Caution – Do NOT go back into an area where a spill has occurred. Rescuers not wearing protective equipment have been overcome by toxic or asphyxiating fumes attempting to rescue others. Determine if any person is injured. Take care not to become a victim yourself. If required, summon a First Aid Officer. To assist the responding emergency service, identify the chemical involved check the SDS or label.</p>	<p>Containment - spills must be cleaned up promptly and thoroughly. Limit access to the spill area to those involved in the cleanup process.</p> <p>Identify the chemical/s and hazards involved – check Material Safety Data sheet. Approach with care. Never assume that the spilled chemicals are harmless. Use the information on the physical and chemical properties of the material to judge response and/or evacuation procedures</p> <p>Choose the appropriate personnel protective equipment. Always wear gloves and protective eyewear. Use additional protective equipment if needed. Confine or contain the spill. Cover/absorb liquid spills with absorbent (e.g., floor dry, sand, paper towels) and sweep/scoop clean up materials into a bag.</p> <p>Decontaminate equipment, clothing and personnel, including any victims, on site if necessary.</p> <p>Dispose of contaminated equipment and materials only after receiving specialist advice.</p> <p>Ensure emergency procedures are in place and practiced.</p>

Specific Chemical Spills and actions

Type of chemical spills	Action
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Acid	Neutralize spill with sodium bicarbonate. Use spill kits that contain soda ash (sodium bicarbonate). Avoid breathing soda ash dust.
Alkali	Neutralize with boric acid.
Mercury	Use the mercury spill kit. Clean up the mercury thoroughly, because mercury vapors from fine droplets that are highly toxic. Once the mercury is contained it should be clearly labeled and submitted for waste disposal.
Body or skin contact	Flood the exposed area with running water from the tap or safety shower for at least 5 minutes. Remove contaminated clothing and make sure that the chemical does not seep into the footwear. Seek medical attention.
Body contact with eyes	Flush the eyes with running water, for example, using the eye- washers in the laboratory for a minimum of 15 minutes. Eyelids have to be forcibly opened to ensure that the water/eye solution goes behind the eyelids. Washing should be done from the direction of the nose out to the ear so as to avoid washing chemicals back into the eye or into an unaffected eye. Remove contact lenses as soon as possible in order to rinse off any harmful chemical from the eyes. Cover both of the victim's eyes with clean or sterile gauze.
Solid or liquid poisoning by ingestion	Get the victim to spit the poison out if it is still in the mouth and wash the mouth with plenty of water. Induce vomiting by stimulating the back of the throat with the tip of a finger. Seek medical attention immediately.



Chemical burns	<p>Remove the victim's clothes and shoes if necessary. Use water only for treating chemical burns. Wash the injured area with running water for at least 10 minutes. This can prevent further damage to the burnt tissue.</p> <p>Minor burns are best treated by soaking the affected area in cold water. Do not apply burn ointments/spray to affected areas. Cover with sterile or dry and clean material.</p> <p>For large affected areas, seek medical attention immediately.</p> <p>Protective gloves and safety goggles should be worn when attempting to assist a casualty covered with chemicals (so that the person, assisting does not in turn become a victim).</p>
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Questions		Satisfactory Response	
<input type="checkbox"/> The trainee should answer the following question		YES	NO
<input type="checkbox"/> The trainee's underpinning knowledge was:			
Explain the rules that must you follow for minimizing accidents resulting from the storage of chemicals			
What is incompatible chemicals			
<input type="checkbox"/> Satisfactory		<input type="checkbox"/> Not satisfactory	
<input type="checkbox"/> Feedback to trainee:			
Trainee's Signature:		Date:	
Instructor's signature:		Date:	
	OPERATION SHEET 3	Unit of competency:	Follow basic chemical safety rules

Answer the following questions. Get the answer sheet from your trainer/ instructor.



		Module Title:	Following basic chemical safety rules
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LO 3: Follow chemical handling and storage rules

Operation Title	Follow chemical handling and storage rules
Purpose	To acquaint the trainees to follow chemical handling and storage rules
Equipment, tools and materials	Equipment hats, face shields, goggles, respirators, overalls, aprons, chemical resistant gloves and footwear.
Conditions or situation for the operation	<input type="checkbox"/> All the tools and equipment should be ready on time.
Procedure	<ul style="list-style-type: none"> ▪ Wear personal protective equipment while you are following chemical handling and storage rules ▪ Follow chemical handling and storage instructions on labels ▪ Follow safety rules when working in areas where chemicals are stored <ul style="list-style-type: none"> <input type="checkbox"/> Followed in the event of an accident or spillage
Precautions	<input type="checkbox"/> Care should be taken when following chemical handling and storage rules.
Quality criteria	<ul style="list-style-type: none"> ✓ Did personal protective equipment worn while following chemical handling and storage rules ✓ Did follow chemical handling and storage instructions on labels ✓ Did follow safety rules when working in areas where chemicals are stored ✓ Did follow procedure in the event of an accident or spillage