Horticultural Crops Production

Level I

Learning Guide –27

Unit of Competence: Apply Basic Chemical Safety Rules

Module Title: Applying Basic Chemical Safety Rules

LG Code: AGR HCP1 M07LO1-LG27

TTLM Code: AGR HCP1 TTLM 07 1219V1

LO1:- Follow workplace requirements and instructions concerning chemicals

Instruction sheet 1	Learning Guide 27

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Identifying Roles and responsibilities of people.
- Recognizing and following Safety procedures**.**
- Identifying and reporting Occupational health and safety hazards.
- Following Organizational procedures**.**

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 people.
- Recognize and following Safety procedures**.**
- Identify and reporting Occupational health and safety hazards.
- Follow Organizational procedures**.**

Learning Instructions

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 7.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” in page 6, 10, 16, and 18 -.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Identifying Roles and responsibilities of people

1.1. Impacts of Chemicals on humans

Chemicals are a part of everyone's life. There are five to seven million different chemicals known in the world.

The frightening reality is that, for the vast majority of the chemicals used and being developed, little or nothing is known about their possible immediate or long-term effects on the health of the workers who produce them or use them at work. Yet workers continue to be required to work with potentially toxic (*poisonous or harmful to the worker*) substances. In some countries, workers are required to work — with little or no protection — with chemicals that are known to be hazardous to human health. Workers in some developing countries are often required to work with toxic chemicals that have been banned in developed countries because of their hazardous effects. Similarly, agriculture workers in developing countries (and in non-union agriculture jobs in some developed countries) often spray herbicides and pesticides without any form of protection. In most developed countries, workers using those same chemicals dress up almost like spacemen in protective clothing to avoid contamination from the chemicals, and are provided with washing facilities and regular medical check-ups.

In many countries chemicals are literally dumped into the environment, often with serious human and environmental consequences. Depending on the chemicals dumped, the results can be serious health problems for the workers (who usually do not know about the dangers from the chemicals) and the community, and permanent damage to the environment. In other countries the laws about chemical disposal are strict in order to protect people and the environment.

Nearly all workers today are exposed to some sort of chemical hazard because chemicals are used in every type of industry, from mining, welding, mechanics and

factory work, to office work, etc. In fact, *chemical hazards are the most serious health hazard for workers today*. Your first line of defense against chemicals is to learn as much as possible about the substances you work with and to prevent exposure to them, no matter how “safe” you may think they are, or how “safe” you have been told they are!

1.2. Role and responsibility of stuff

In order to effectively manage your staff, it is important to provide them with a clear definition and understanding of their role, function, and responsibilities in the workplace. This will provide them with a good understanding of the job and tasks they are to perform as an individual and within any teams they are a part of. It also provides information on where they fit within the organization and who they report to, helping to avoid disputes and misunderstandings over authority.

When defining roles and responsibilities in the workplace, you may need to create a list of all of your staff and a list of all of the tasks and roles within your business. You can then assign the roles to each staff member or group of staff. It is important to remain flexible and be prepared to modify your plan in consultation with your employees.

Once you have defined each person's roles and responsibilities, you can record this in *a "job description"*. This can be as formal or informal as you prefer, however it is important to record the key information. Job descriptions provide the opportunity to clearly communicate each individual's roles and responsibilities and also serve as a way to measure performance by setting KPI's (Key Performance Indicators) against the tasks or requirements.

With the role of each individual in the organization defined, you can also create an organization chart. This chart is a tool that helps to define the inter-relationships between all departments, divisions, teams and people. It defines reporting structures and lines of authority and responsibility, providing a picture of how the organization functions.

Failing to define workplace roles and responsibilities can *create tension, miscommunication and inefficiency* within your business. People may be unsure as to what jobs are their own and who they are required to report to. Mistakes and omissions can also occur where people are unsure of what is required of them, therefore creating inefficiencies which cost time and money.

Employers and employees have responsibilities to each other; they should also expect their rights to be upheld. These rights and responsibilities relate to areas such as *Health and Safety*, the provision of Terms and Conditions of Employment, Equal Opportunities and the right to be paid a Minimum Wage. The Health and Safety at Work Acts set out responsibilities and rights for both employees and employers. Employees are expected to carry out their work in a way that has regard to the safety of others. Employers are expected to abide by a range of requirements governing such aspects as providing safe machinery and equipment, carrying out regular health and safety checks, ensuring the training of employees in health and safety issues, and carrying out a risk assessment to assess the dangers of particular work activities.

There are also specific regulations about the way in which potentially harmful substances should be used and stored. Employees are expected to receive the terms and conditions of their work setting out when their work commences, what their main duties are, who they are accountable to, rates of pay, and other entitlements. Employers and employees are expected to meet minimum legal requirements for such areas as Health and Safety at Work, and minimum standards and conditions related to hours, and the treatment of people in the workplace. Along with rights for employees there are corresponding responsibilities such as the expectation to work in a safe way and to have regard for the safety of work colleagues.

Self-Check 1	Written Test

Name: _____ Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. Describe some of the roles and responsibilities of employees and employers in the occupational area? (5 pts)
2. Write the negative impacts of chemicals (5 pts)
3. To whom, where and when chemicals are toxic to human beings? (5 points)

Note: **Satisfactory rating - 15 points and above** **Unsatisfactory - below 15 points**

Name: _____ Date: _____

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

Information Sheet-2	Recognizing and following Safety procedures

2.1. Standard Operating Procedures

It is impossible to design a set of rules that will cover all possible chemical or laboratory hazards and consequences. The general prudent practice guidelines described below have been shown through experience to be useful for avoiding accidents or reducing injuries associated with the laboratory use of hazardous chemicals.

1.) Planning Chemical Use: Before beginning an operation or performing an experiment, and be prepared to prevent such an occurrence or to take proper emergency actions. Answers to this question will require an understanding of the hazards associated with the chemicals and equipment involved.

- ***Research Hazards***: All chemicals and the manner in which they are intended to be used must be scrutinized by the user to identify potential hazards before acquiring the material or conducting a procedure - if the material is already in.
- ***Post Laboratory***: An ***appropriate sign must be posted*** on the outside of the main door to the laboratory

2) ***Assure Adequate Hazard Controls and Emergency Equipment*****:** Once the hazards have been identified, commensurate hazard controls and emergency equipment must be planned and acquired or developed to adequately control the hazards to a negligible risk level and to respond to any emergencies which may arise for general guidance.

- An ***approved safety shower and eyewash*** must be provided within the work area for immediate use

- A ***fire alarm and telephone for emergency*** use must also be nearby (within 50 feet)
- ***Chemical storage space*** adequate to the lab's needs and responsive to the requirements outlined in Chemical Management Best Practices must be provided for activities involving chemicals.
- A ***hazard assessment survey*** must be conducted and documented to assess the need for personal protective

3) Chemical Acquisition: Hazardous chemical must be acquired according the guidelines described in Chemical Management Best Practices.

4) ***Labeling/Identification***: All hazardous chemicals must be properly labeled at all times, from the time they are brought into, to the time they are removed for disposal per Chemical Management Best Practices.

5) Chemical Inventory: Laboratories must at all times maintain an adequate inventory of the hazardous chemicals in the laboratory according to Chemical Management Best Practices -

6) Storage: The storage of hazardous chemicals must be accomplished in a manner that minimizes safety and health hazards to personnel, equipment, buildings, and the environment per Chemical Management Best Practices.

7) Distribution: The method of transportation of hazardous chemicals must reflect the potential danger posed by the specific chemical and shall be done in accordance with Chemical Management Best Practices

8) General Hazardous Chemical Use: Each Lab Worker with the training and information provided by his/her supervisor, must develop and implement work habits to minimize chemical exposures to his/her selves, others and the environment. Based on the realization that all chemicals inherently present hazards in certain conditions, exposures to all hazardous chemicals must be minimized.

9) Flammable chemicals must be handled only in areas free of ignition sources (e.g. *open flames, static electricity, burning tobacco, hot surfaces*). Flammable chemicals must never be heated by using an open flame. Preferred heat sources include steam baths, water baths, oil baths, heating mantles, and hot air baths.

10) ***Hazardous Chemical Disposal***: Laboratory Supervisors are responsible for ensuring that all used and/or unneeded hazardous or articles irreversibly contaminated with these hazardous chemicals, are disposed of according to requirements described in Chemical Management Best Practices

11***) Hazardous Waste Minimization/Pollution Prevention***: The cost of disposing of excess and waste chemicals has become extremely expensive, and frequently exceeds the original cost of purchasing the chemical. Every reasonable effort must be made to reduce the generation of hazardous waste.

Self-Check 2	Written Test

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

Question 1: List and describe ways of reducing injuries associated with the laboratory use of hazardous chemicals. (5 pts)

Question 2: Mention *Hazard Controls and Emergency Equipment*. (5 pts)

Question 3. Define *Flammable chemicals*. (5 pts)

Question 4: Putdown and explain some of the Safety procedures of hazardous chemicals controls. (5 pts)

Note: **Satisfactory rating - 20 points and above** **Unsatisfactory - below 20 points**

Name: _____ Date: _____

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

Information Sheet-3	Identifying and reporting Occupational health and safety hazards

3.1. Types of hazards

What kinds of hazards exist in the workplace?

Some common hazards that may be in your workplace include:

- ***Chemical hazards***, arising from liquids, solids, dusts, fumes, vapors, gases;
- ***Physical hazards***, such as noise, vibration, unguarded machinery, unsatisfactory lighting, radiation, extreme temperatures (hot or cold);
- ***Biological hazards***, from bacteria, viruses, infestations, infectious waste;
- ***Psychological hazards***, resulting from stress and strain;

Points to remember

1. Occupational exposure to hazards can break down your body's defense systems.

2. Occupational hazards need to be controlled for a workplace to be safe and healthful.

3. Some common workplace hazards are: Chemical hazards, physical hazards, biological hazards, psychological hazards and non-application of ergonomic principles

4. It is important to learn about occupational hazards, including how exposure to such dangers can affect your health and how to protect yourself from exposure to such dangers in the workplace.

Types of chemical hazards found in the workplace

The physical form of a chemical can affect how it enters your body and to some extent, the damage it causes. The main physical forms of chemicals are solids, dusts, liquids, vapours and gases.

A. Solids

- Solids are the least likely of the chemical forms to cause chemical poisoning. However, certain chemical solids can cause poisoning if they get onto your skin or food and you then ingest them. Personal hygiene is important to prevent the ingestion of chemical solids.
- The greatest danger with solids is that some work processes can change them into a more dangerous form. For example, wood that is being cut can turn into wood dust which can then be inhaled. Welding rods can decompose into fumes and gases.

B. Dusts

- Dusts are tiny particles of solids.
- You can be exposed to dust in the workplace from materials that normally exist in dust form (for example, bags of cement), or from work processes that create dust (for example, handling glass fiber can produce toxic dust).
- The main danger from harmful dusts is that you can breathe (inhale) them into your lungs. When breathed in, the larger dust particles are usually trapped by hairs and mucus and then removed by the body. Smaller particles, however, are more dangerous because they can get deep inside the lungs where they can have damaging effects, or they can be absorbed into the bloodstream and travel to other parts of the body where they can cause damage. They can also cause eye damage.
- Dusts can be hard to see — you often cannot even see a cloud of tiny dust particles except with special lighting.

C. Liquids

- Many hazardous substances, such as acids and solvents, are liquids when they are at normal temperature.
- Many liquid chemicals give off vapors' which you can inhale and which may be highly toxic, depending on the chemical.

- Liquid chemicals can be absorbed by your skin. Some liquid chemicals may cause immediate skin damage (they may or may not be absorbed into the bloodstream as well). Other liquids pass directly through the skin into the bloodstream, where they can travel to different parts of the body and cause damaging effects.

D. Vapors

- A vapor is the gas phase of a material which is normally liquid under standard conditions.
- Many liquid chemicals evaporate at room temperature, which actually means that they form a vapor and stay in the air.
- The vapors from some chemicals can irritate your eyes and skin.

E. Gases

- Some chemical substances are in the form of a gas when they are at a normal temperature. However, some chemicals in liquid or solid form become gases when they are heated.
- Gases can be inhaled.
- Some gases produce irritant effects immediately. The health effects of other gases may be noticeable only after your health has already been seriously damaged.
- Gases may be flammable or explosive. Extreme caution should be used when working around flammable or explosive gases

F. Effects of chemicals on the environment

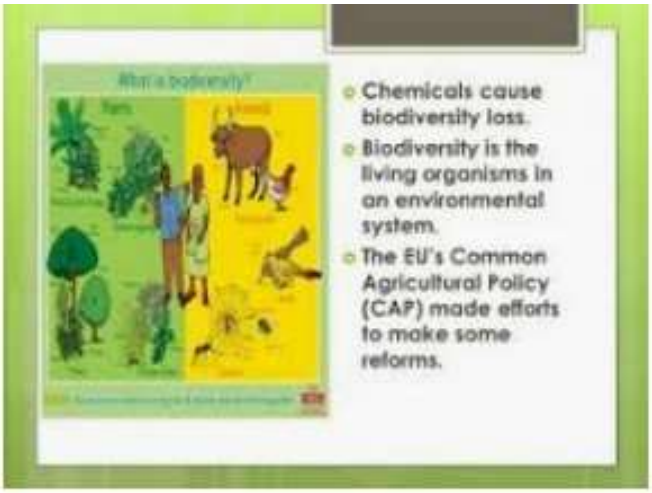

Fig 3.1 environmental impacts of pesticides

Many employers do not dispose of chemical wastes safely.

Do you know what happens to chemical waste from your workplace?

Many employers are not aware of the hazards associated with toxic chemicals and often do not know how to dispose of chemical wastes safely. (Employers also need to be educated about chemical hazards.) As a result, these employers often simply “dump” waste chemicals into the environment. Convenient dumping grounds are the ocean, rivers, lakes, fields, roadsides, etc. Sometimes these dumping grounds are right in the community where you and your family live and work.

Toxic chemicals which are improperly disposed of may eventually end up in your *drinking water,* in the places where your children play, in the soil where your food is grown, etc.

Your home “environment” can be exposed to the chemicals in your workplace, too.

Your family can be exposed to your workplace hazards if you bring chemicals or other workplace contaminants home with you on your clothes, hair or skin.

Self-Check 3	Written Test

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

Question 1: List and describe *types of hazards exist in the workplace*. (5 pts)

Question 2: Mention the *Physical hazards*. (5 pts)

Question 3. List down some of *chemicals found in the workplace*. (5pts)

Note: **Satisfactory rating - 15 points and above Unsatisfactory - below 15 points**

Name: _____ Date: _____

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

Information Sheet 4	Following Organizational procedures.

4.1 Safe disposal procedures

Suggestions for the safe disposal of chemicals include:

- Always follow the manufacturers' instructions for proper disposal
- *Return empty containers* to the manufacturer or check with your local council on proper disposal methods.
- Audit your chemical store on a regular basis and dispose of any excess or outdated chemicals in the appropriate manner.

4.2. Seek medical help

- If you think you are suffering any ill effects from chemical exposure, see your doctor immediately, contact Poisons information or go to a hospital with an emergency department. Be sure to inform them what chemicals you may have been exposed to (take your MSDS).
- Try to avoid using the chemical in the future, select the safest possible chemical to use and follow MSDS.

Things to remember

- Exposure to chemicals can lead to a variety of immediate or long-term health effects including *headache, poisoning, respiratory illness, burns and birth defects*.
- Manufacturers and importers are required to supply a Material Safety Data Sheet (MSDS) that explains how to handle the chemical safely.
- Always follow the manufacturers' instructions on storage, use and disposal of chemicals.

Organizations such as Work Safe Victoria can offer valuable advice on improving health and safety on your farm.

Self-Check- 4	Written Test

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1: List and describe the long-term health Exposure effect of chemicals (5 pts)

2: Mention the symptoms/signs of chemical exposure. (5 pts)

3. List the specified information's on Safe disposal procedures of chemicals. (5pts)

Note: **Satisfactory rating - 15 points and above** **Unsatisfactory - below 15 points**

Name: _____ Date: _____

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

Operation Sheet 1	Identifying and reporting Occupational health and safety hazards

Objectives

- To Identify and report Occupational health and safety hazards

Materials

- ✓ PPE

Methods of identifying and reporting Occupational health and safety hazards

Procedures

1. Identify chemical which needs protective equipment and which does not needs
2. Identify different types of protective equipment
3. Carry out how to wear protective equipments and clothing, never wear leather products which absorbs chemicals
4. Mix one of the chemical and apply
5. In case of a pesticides spill or splash at work site, wash your body immediately after contact.
6. Clean protective equipment and clothing after application
7. Wash your hands or take shower at the end of the application.

LAP Test	Practical Demonstration

Name _____ Date: _____

Time started: _____ Time finished: _____

Instructions:

1. You are required to perform any of the following:

Task 1. Identify Roles and responsibilities of people to prevent themselves from hazardous chemicals

Task 2. Identify Occupational health and safety hazards

Horticultural Crops Production

Level I

Learning Guide –28

Unit of Competence: Apply Basic Chemical Safety Rules

Module Title: Applying Basic Chemical Safety Rules

LG Code: AGR HCP1 M07 LO2LG28

TTLM Code: AGR HCP1 TTLM 07 1219V1

LO: 2 Recognize Risks Associated with Chemicals

Instruction sheet 1	Learning Guide 1

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- . Recognizing Functions of chemicals.
- . Recognizing and identifying Chemical labels
- . Identifying Chemical storage locations.
- . Recognizing and observing instructions for chemicals.
- . Identifying and observing instructions for use, maintenance and storage of PPE

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.
- . Recognize and identify Chemical labels
- . Identify Chemical storage locations.
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Learning Instructions

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6. If you earned a satisfactory evaluation proceed to “Information Sheet 1 and 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
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Information Sheet-1	Recognizing functions of chemicals

1.1. Chemical Exposure

- **A workplace should be safe for all workers**

Any union strategy to protect workers against chemical hazards should try to create a working environment where it is safe for all workers — the average worker (male or female) and even vulnerable workers — to work without the job affecting their health. Regular medical examinations must never be used by the employer to eliminate "vulnerable" workers, such as women of childbearing age.

- **Exposure to toxic chemicals can lead to accidents**

Exposure to toxic chemicals can also lead to *higher rates of accidents* at work. Unfortunately, when accidents occur in the workplace, management often blames the worker, claiming he or she was careless. This tendency to "blame the victim" is yet another reason to learn about the substances you work with, to make sure the proper control measures are in place, and to know your rights!

Ways of Chemical Exposure

- **Inhalation** - Gases, vapors of volatile liquids, mist and sprays from liquids, particles from solid chemicals, fibers and dusts are all materials that may enter the *body via inhalation*. The inhaled material can act locally to *damage the mucous membranes of the mouth, throat and lungs.* The inhaled material may be directly absorbed through the mucous membranes and into the body or can pass into the capillaries of the lungs and be carried into the circulatory system.
- **Ingestion** - Many chemicals can be harmful, even fatal, if they enter the mouth and are swallowed. After ingestion, a chemical may act locally to cause irritation and

burns to the mouth throat and stomach or the chemical may be absorbed into the blood and cause systemic injury.

- **Contact with the Skin** - Chemical contact with the skin can be a frequent mode of injury in the laboratory. Contact with the skin by certain chemicals can produce irritation and allergic reactions. Corrosive chemicals can cause minor to very serious burns to the skin, while other chemicals may be directly absorbed through the skin in sufficient quantities to produce systemic toxicity.
- **Contact with the Eyes** - The eyes are so sensitive that very few substances don't cause irritation when they come into contact with the eyes. The eyes contain a large number of blood vessels which can be a route for direct chemical absorption into the body.
- **Cuts/Punctures/Injections** - Always take care when using sharp instruments (needles, scalpels, etc...). Cutting yourself or puncturing your skin with a needle may result in you being exposed to a chemical; this is one of the most dangerous routes of exposure since a chemical may be directly injected into the bloodstream thus bypassing the process of absorption.

The following figures help to explain how chemicals can enter the body and the effects they can have once they are in the body.

Routes of entry of chemicals into the human body

Organs and tissues that may be affected by particular toxic industrial chemicals

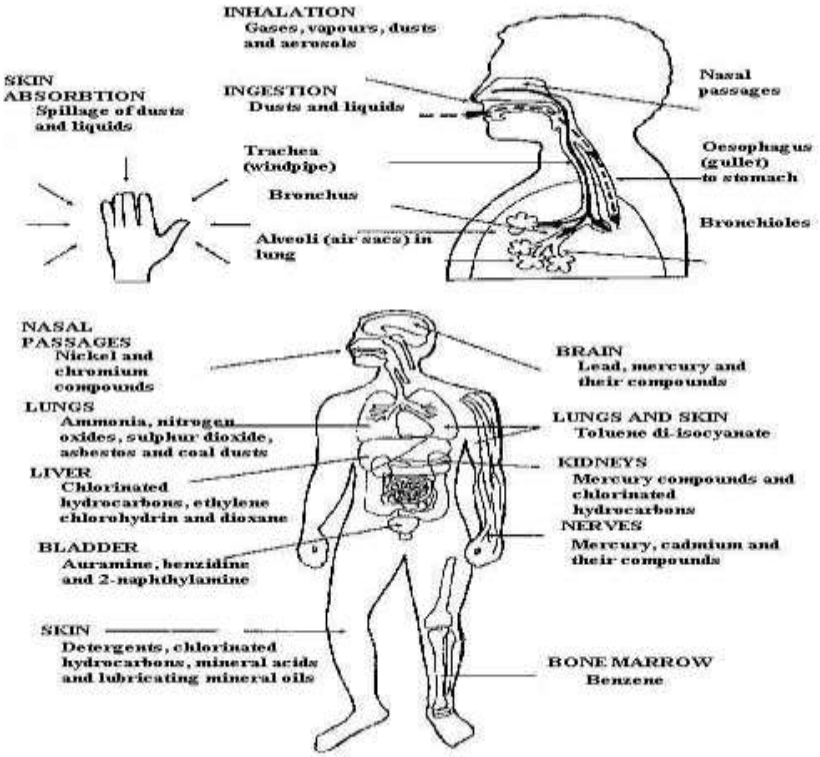

Fig 1.1 *Organs or tissues that may be affected by chemicals*

It is important to understand that workers may show different physiological responses to industrial chemicals, just as people may show varied responses to different medicines, foods, etc. Some employers may try to select workers who are more "*resistant to hazards*" (so-called "super workers") and remove workers who show any signs of poor health. It is also common for employers to refuse to employ women of childbearing age on work processes that are known to affect the development of the fetus in the womb (such as work involving lead).

Toxic Effects of Chemicals

There are a number of factors that determine the type of toxic effect a chemical can have on you. These factors include:

- The *chemical composition* of the hazardous substance (certain substances are more harmful than others because of their chemical structure);
- The physical form of the chemical (*dust, vapor, liquid*, etc.);
- The route of entry by which the chemical gets into the body
- The particular tissues and organs in which the chemical collects or localizes;
- The *frequency, concentration, and length of exposure*; and
- The worker's individual response to the chemical, which can vary a great deal from person to person.

The toxic effects of a chemical may occur in one of three ways:

1. **Acute** - Single Exposure
2. **Intermittent** - Repeated Exposure
3. **Chronic** - Long-Term Repeated Exposure

Some signs of potential chemical exposure (acute, intermittent or chronic) include:

- Do you smell something? An odor in the air.
- Coughing
- Headache
- Fatigue
- Blotches on skin
- Burning sensations in the eyes, nose, mouth and/or throat.
- Nausea

- Dizziness

Toxicity

As defined, toxicity is the ability of a substance to cause damage *to living tissue, impairment of the central nervous system, severe illness or in extreme cases, death when ingested, inhaled or absorbed through the skin.*

Chemical Exposure to the Skin and Eyes

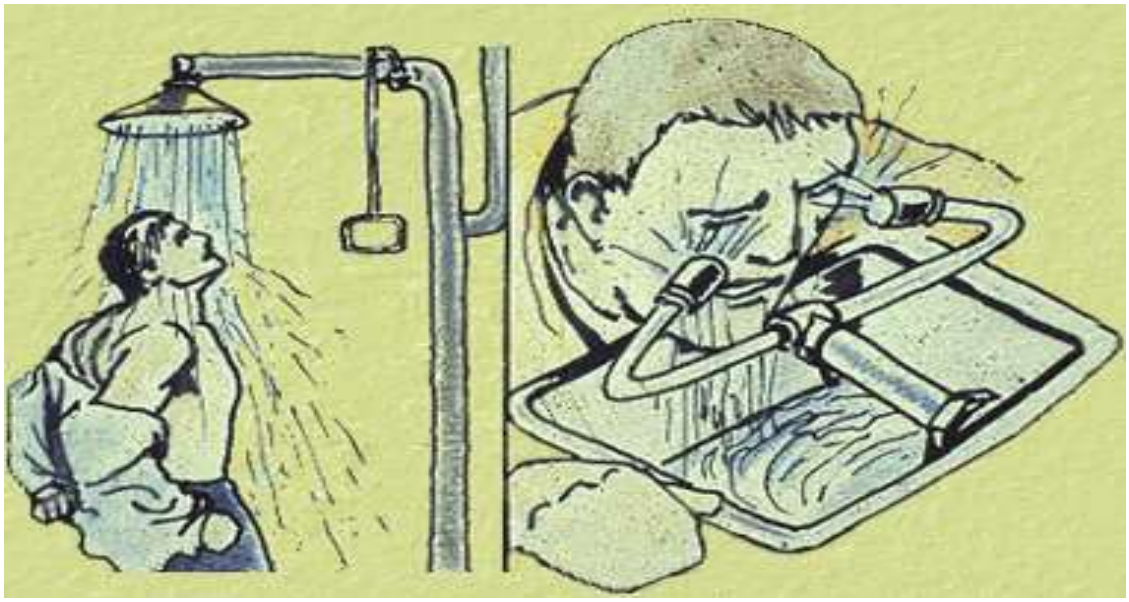

Fig 1.2 *eye-wash, shower or sink*

EYES

If you get a chemical in your eye(s) get to an *eye-wash, shower or sink*. Flush your eyeball and inner surface of eyelid with water continuously for 15 minutes. When you get something in your eye it will most certainly be painful and irritating, you will not want to open your eye to flush it out.

SKIN

If you spill a chemical on your person get to a shower or a sink. Don't be modest, remove any contaminated clothing immediately and flush the affected area with plenty of water for at least 5 minutes. Make sure chemical has not accumulated in shoes. If necessary seek medical attention.

	***Points to remember about routes of entry/health effects***

1. *Chemicals can enter the body by inhalation, ingestion, or skin absorption.*
2. *Toxic chemicals can cause a variety of harmful effects on different parts of the body, including acute, local, chronic and systemic effects.*
3. *There are a number of factors that determine the type of toxic effect a chemical can have on you, including the form of the chemical, route of entry, and individual response to the chemical.*
4. *Exposure to toxic substances in the workplace can also lead to higher accident rates.*
5. *It is important to learn about the substances you work with, make sure the proper control measures are in place, and to know your rights.*

Self-Check 1	Written Test

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

Question 1: List and describe ways of chemical exposure in to the body. (5 pts)

Question 2: Mention the symptoms/signs of chemical exposure. (5 pts)

Question 3. List the toxic effects of chemicals (5pts)

Note: **Satisfactory rating - 15 points and above** **Unsatisfactory - below 15 points**

Name: _____ Date: _____

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

Information Sheet-2	Recognizing and identifying Chemical labels

2.1. Chemical labels

Labels are the primary, initial source of warning for faculty, staff and students when handling hazardous chemical substances.

Proper Chemical Labeling

Faculty members and/or Laboratory supervisors MUST ensure that all incoming containers of hazardous materials bear a label specifying the following:

- Appropriate hazard warnings.
- Identification of the chemical in the container and identification of the hazardous component(s).
- Name, address and telephone number of the chemical manufacturer, importer or responsible party (e.g. principal investigator/faculty member).
- Date of receipt or generation of the chemical.

Chemical Labeling -- Hazard Information

Hazard warnings found on the labels of hazardous chemical containers may be composed of pictures, symbols, and words or any combination thereof which convey the hazard(s) of the chemical.

Picture Hazard Warnings

Picture hazard warnings help to identify the following properties and classes of hazardous compounds.

Here are a few EXAMPLES....

Fig 2.1 Picture of Hazard Warnings

2.2. Symbol Hazard Warnings

Symbol hazard warnings provide basic information in determining what precautionary measures to use when handling hazardous chemical substances and/or dealing with a fire.

The National Fire Protection Association (NFPA) uses a symbol system designed as a diamond-shaped label containing four differently colored squares. A number (0 - 4) is added to each square indicating the order of hazard severity.

BLUE DIAMOND, *HEALTH HAZARD*
4 - Deadly
3 - Extreme Danger
2 - Hazardous
1 - Slightly Hazardous
0 - Normal Material

RED DIAMOND, *FIRE (FLAMMABILITY)*
4 - Flash Point Below 73 ^{o}F
3 - Flash Point Below 100 ^{o}F
2 - Flash Point Above 100 ^{o}F, not exceeding 200 ^{o}F
1 - Above 200 ^{o}F
0 - Will Not Burn

YELLOW DIAMOND, *REACTIVITY*
4 - May detonate
3 - Shock and heat may detonate
2 - Violent chemical change
1 - Unstable if heated
0 - Stable

WHITE DIAMOND

SPECIAL HAZARD

Fig 2.2 Symbol of Hazard Warnings

2.3. Word Hazard Warnings

Word hazard warnings contain a word or words intended to capture the worker's immediate attention (e.g. flammable, poison, and fatal if swallowed). These word labels should be in English, but other languages may be used where needed.

Fig 2.3 Word of Hazard Warnings

Signal words - are warnings used to designate the degree of hazard.

Signal Word	Degree of Hazard
DANGER	*Highest degree of hazard (Red Text)*
WARNING	*Intermediate degree of hazard (Orange Text)*
CAUTION	*Lowest degree of hazard (Yellow Text)*

Self-Check 2	Written Test

Directions: **Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.**

1: List down the importance of chemical labels. (5 pts)

2: Mention Picture hazard warnings. (5 pts)

3. Mention some of the information listed on chemical labels (5pts)

4: explain some of the symbol used by National Fire Protection Association (NFPA) to show hazard warning (5 pts)

Note: **Satisfactory rating - 20 points and above Unsatisfactory - below 20 points**

Name: _____ **Date:** _____

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

Information Sheet-3	Identifying Chemical storage locations

3.1. Hazardous waste storage requirements

This section provides requirements and recommendations for storing hazardous materials. Refer to the section entitled to determine if a chemical, material, product or mixture is hazardous. Refer to for hazardous waste storage requirements.

Procurement

- Chemical storage, whether in a laboratory or central storeroom, should be under the supervision of a qualified person: the Hazardous Substance Controller.
- Before a substance is received, information on proper handling, storage, and disposal must be known to those who will be involved. Refer to the appropriate MSDS for further information.
- Payment for ordered chemicals must be made conditional upon the receipt af an MSDS (for each chemical) conforming with the standard prescribed in the Occupational Health and Safety
- No container may be accepted into a laboratory without an adequate identifying label.
- This label cannot be removed, defaced, or damaged in any way. All substances should be received in a central location.

A store for chemical substances should be:

- Separated by means of *fire resistant material* with a fire resistance of at least two hours from any building or room which may be affected by the materials being stored.
- Constructed of fire resistant material with a minimum fire resistance of two hours.

- Equipped with *suitable shelving*, if necessary, constructed of non-porous and non-combustible material.
- A properly *ventilated area*; this includes forced ventilation from floor to ceiling with exhaust above roof level, and ventilated to the open air in such a manner that vapor cannot accumulate inside the store.
- Clearly *marked with a sign* indicating that it is such a store and also indicating the maximum amount of liquid material that may be stored therein.
- Equipped with facilities readily available where *personal protective equipment* for the users can be kept, in such a way as to prevent contamination thereof.
- Equipped with *washing facilities* for personal hygiene, adequate and appropriate to user's expected exposures.
- Equipped with fire extinguishers of a quantity and type suitable for the expected fire risk, in an accessible location close to the store.

Hazardous Material Storage Requirements

General Requirements, Storage Cabinets and Shelves

Refrigerators Used for Hazardous Material Storage

Squeeze Bottles, and Wash Bottles

Fig 3.1 **Storage of Hazardous Material**

Self-Check- 3	Written Test

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1: List and describe Hazardous Material Storage. (5 pts)

2. Putdown and explain some of the rule for storage of chemical substances (5 pts)

Note: **Satisfactory rating - 10 points and above** **Unsatisfactory - below 10 points**

Name: _____ Date: _____

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

Information Sheet-4	Recognizing and observing instructions for chemicals

Carefully read the ingredient list of any product or chemical you use. The label can also tell you how to use the proper protective equipment, how to handle the chemicals, and how to respond to emergencies. The label will tell you if the substance is flammable, corrosive, or may cause cancer. It will also state whether you should use eye protection, gloves, or other equipment.

Exposure to agrochemicals puts many farm workers at risk of various occupational diseases. The exposure may be as a result of workers own negligence, inadequate knowledge and safety systems. There are reports of acute cases with symptoms typical of exposure to agrochemicals. To eliminate such hazards, we need to take safety precautions in agrochemicals handling and usage.

Precautions during purchase

1. First, choose trusted agrochemical dealers.
2. Acquire only the required quantity if you do not have a safe storage place. Example; Insecticides may come in 250ml or 1lt packages for a single application.
3. Reject leaking containers, loose or torn bags. Watch out for all signs of breakage. Chemical spills are very dangerous to contact.
4. Look out for clear and approved labels, otherwise, do not buy

Precautions during storage

1. Do not store agrochemicals close to the residence.
2. Always keep chemicals in original containers or make sure they are always well labelled.
3. Keep agrochemicals very much away from food or feed.
4. Keep away from the reach of children and livestock.

5. Do not expose agrochemicals to direct sunlight or rainwater.
6. Do not mix different agrochemicals in storage. eg. mixing weedicides with pesticides. You must arrange them well and show their place in the storage room/space.

Precautions during handling

1. Do not transport chemicals with food materials.
2. Do not carry them on your head, shoulder or on your back

Precautions when preparing solution to apply

1. Use clean water.
2. Use protective gear to protect the nose, eyes, mouth, ears, hands and other parts of your body. Wear hand gloves, respirators, caps during the preparation and application of the chemical solution. Feet must also be protected boots or polyethene.
3. Make sure protective gear is not contaminated with chemicals.
4. Read and understand application rates and rules on the container. Consult an expert if do not understand the label.
5. Always use chemicals at required rates.
6. Do not taste or smell solution smell to test its concentration. It is poisonous to the body.
7. Do not eat while preparing the solution.
8. Avoid skin contact with chemicals when opening the container. If there is contact, wash immediately with plenty of clean water.

Self-Check -4	Written Test

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1: List safety precautions in agrochemicals handling and usage. (5 pts)

2. Mention the importance of safety instructions (5 pts)

Note: **Satisfactory rating - 10 points and above Unsatisfactory - below 10 points**

Name: _____ Date: _____

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

Information Sheet-5	Identifying and observing instructions for use, maintenance and storage of PPE

A comprehensive personal protective equipment (PPE) program not only can be one of the easiest safety and health programs everybody can implement and maintain, but it also can be one of the most beneficial. Before we even consider PPE we must follow the hierarchy of controls (Engineering, Administrative and then PPE). First take the hazard out of the work areas by instituting engineering controls, e.g., ventilation hoods, gas cabinets, guarding, etc. Then, consider administrative controls, e.g., limit the amount of time an individual is allowed to work with or is exposed to a given hazard. Last is personal protective equipment. Since PPE can fail, and relies on the worker to use it properly, and leaves the hazard in the workplace, PPE is always our last line of defense against workplace contaminants and physical hazards. We use PPE when engineering controls are not adequate to control exposures, during emergency and clean-up procedures, to supplement engineering and administrative controls, and sometimes simply for comfort.

Why do we use PPE?

Experience tells us that we can prevent most workplace injuries with the help of properly selected, worn and maintained PPE. In some cases it's also the law! According to state law all employees are required to wear at least safety glasses in our laboratories. Most laboratories also require gloves and lab coats, plus other unique PPE. In the United States, thousands of people are blinded each year from work-related eye injuries that could have been prevented with eye protection.

Common types of PPE include the following: Eye and face protection, e.g., safety glasses, safety, goggles, safety side shields, face shields, laser and welding shields;

Maintenance of PPE

PPE includes items like safety helmets, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses, as well as respiratory protective equipments. Employees who use head protection should be trained to: Keep their helmets clean with warm water and soap, on a regular basis.

Proper storage of PPE

The storage should be adequate to protect the PPE from contamination, loss, damage or deterioration. Fixed accommodation is not always necessary, for example safety glasses may be kept by the user in a suitable carrying case and PPE used by mobile workers can be stored in suitable containers in their vehicles.

Contaminated PPE should be stored separately. And where quantities of PPE are stored, equipment which is ready for use should be clearly segregated from that which is awaiting repair or maintenance.

Self-Check 5	Written Test

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1: Why do we use PPE? (5 pts)

2: where do you store PPE? (5 pts)

3: Putdown and explain the Common type's instruction used for PPE (5 pts)

Note: **Satisfactory rating - 15 points and above Unsatisfactory - below 15 points**

Name: _____ Date: _____

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

Operation sheet 1	Recognizing and identifying Chemical labels

Objectives

- ✓ To select site for chemicals storage
- ✓ To handle chemicals
- ✓ To identify chemicals labels and symbols

Material required

- tables
- symbols
- chemicals
- PPE

Methods of Recognizing and identifying Chemical labels

Procedures

1. Wear appropriate protective clothes such as gown, gloves, boots and face marks
2. Close all the buttons of gown and do not allow direct contact of skin and chemicals
3. Hold the chemicals carefully and read the labels written by the manufacturer
4. Give attention for expire date, concentration, indication, and contraindication
5. Strictly follow the labels for making working solution and to prepare for safe working practice
6. Emphasis on signal words or pictures which are written on the bottles(containers)
7. Rinse the gloves, boots and other materials before taking them off and dispose in appropriate waste disposal places

Operation Sheet 2	Site selection, handling and storage of chemicals

Objectives

- ✓ To Identify Chemical storage locations

Material required

- Locker
- Shelf
- storage house
- PPE

Method of Site selection, handling and storage of chemicals

Procedures

1. Select the site that separated from other equipments and storage facilities and far from floodplain
2. Select materials for construction
3. Construct a simple storage house
4. Make ventilation, spill and drainage , and have sources of heat and water be fireproof
5. Make a secure locking systems
6. Mark the building with placards indicating the presence of pesticide inside the house
7. Store the pesticides
8. Separate each pesticides class for storage on its own shelf
9. Keep the product off the floor
10. Practice a good housekeeping or lock the house

LAP Test	Practical Demonstration

Name _____ Date: _____

Time started: _____ Time finished: _____

Instructions:

1. You are required to perform any of the following:

   Task 1. Draw Chemical labels

   Task 2. Show hazardous Chemical control methods

   Task 3. Store chemicals

Horticultural Crops Production

Level I

Learning Guide –29

Unit of Competence: Apply Basic Chemical Safety Rules

Module Title: Applying Basic Chemical Safety Rules

LG Code: AGR HCP1 M07 LO3-LG29

TTLM Code: AGR HCP1 TTLM 07 1219V1

LO: 3 Follow chemical handling and storage rules

Instruction sheet 2	Learning Guide 1

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Following Chemical handling and storage instructions.
- Following Safety rules on chemicals Storage areas.
- Using appropriate personal protection equipment on chemicals Storage areas.
- Following Procedures in the event of an accident or spillage.

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 Chemical handling and storage instructions.
- Follow Safety rules on chemicals Storage areas.
- Use appropriate personal protection equipment on chemicals Storage areas.
- Follow Procedures in the event of an accident or spillage.

Learning Instructions

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 7.
3. Read the information written in the “Information Sheets “1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” in page 53, 56, 60 and 66.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information sheet 1	Following Chemical handling and storage instructions.

1.1. Safe handling of agrichemicals

There are many chemicals on the farm and some of them can be dangerous. Common agricultural chemicals include fuels, pesticides, herbicides, fungicides and veterinary chemicals. Exposure to chemicals can lead to health effects including headache, poisoning, respiratory illness, burns, cancers and birth defects. Always follow the manufacturers' instructions for storage, transport, use and disposal of chemicals. Keep all chemicals locked away and out of reach of children and wear appropriate protective gear.

Hazardous materials are required by law to include a Material Safety Data Sheet (MSDS) and label. The MSDS gives valuable information on how to safely handle the chemical. Before using any farm chemical, you should read the label, understand the MSDS and follow usage instructions.

To further reduce the risks, it is worth remembering that hazardous chemicals can occasionally be replaced with less toxic options. Sometimes, a safer form of the product is available. For example, pellets may be used instead of powder.

1.2. Side effects of exposure

The effects of chemical exposure depend on the type of chemical and the degree of exposure. If chemicals are swallowed, absorbed through the skin or inhaled as a mist, vapor or dust, some of the immediate and long-term effects can include:

- Poisoning
- Headache
- Skin rashes and irritation
- Chemical burns
- Cancer

- Birth defects
- Diseases of the lungs, liver or kidneys
- Nervous system disorders.

MSDS information

Manufacturers and importers are required to supply a Material Safety Data Sheet (MSDS) that details information on the chemical, including:

- The registered use of the chemical
- Precautions for use
- Possible health effects
- Safety measures for handling
- Contact numbers for further information
- Withholding periods – It is the responsibility of the farmers to ensure correct usage and slaughter or production-withholding periods are observed.

It is important that you research chemicals prior to purchase to ensure that you buy the most suitable and least dangerous chemical available to do the job you require. MSDSs can be found online to assist in safe and effective chemical choices and should be thoroughly read before use and kept in an accessible place for reference.

1.3. Safe storage of chemicals

Suggestions for the safe storage of chemicals include:

- Always *follow the manufacturers' instructions* for proper storage.
- Keep chemicals in their original containers and don't pour into smaller bottles.
- *Don't remove labels* from containers.
- *Store chemicals in a locked, well-ventilated shed* with floors that will contain spills.
- Store chemicals and personal protective equipment (PPE) in different locations.
- Separate different classes of chemicals to prevent reactions.

1.4. Safe transport of chemicals

Suggestions for the safe transporting of chemicals include:

- Transport chemicals *separately from food, water, animal feeds, seeds and fertilizers*. This applies to transport of household and home garden quantities of the chemical, as well as bulk transport.
- Secure your load.
- Carry a written record of the chemicals you are transporting.
- Take all appropriate protective gear along with you.

1.5. Safe use of chemicals

Suggestions for the safe use of chemicals include:

- Ensure anyone using agricultural chemicals is *suitably trained to use* both the chemical and any equipment required for application.
- *Only mix the quantity of chemical required* for the task at hand.
- Make sure the decanting and *mixing area is well ventilated*. If this is not possible, ensure that appropriate personal protective equipment (PPE) is worn for enclosed environments.
- Follow the manufacturers' instructions on the label.
- Always *wear protective clothing* such as chemical-resistant gloves, face shields or masks, overalls and goggles.
- Avoid exposing non-target animals or plants.

Self-Check 1	Written Test

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. List and describe side effect of chemical exposure in to the body. (5 pts)
2. Mention the about Data Sheet information on the chemical. (5 pts)
3. explain the handling methods of agrichemicals (5 pts)

Note: **Satisfactory rating - 15 points and above Unsatisfactory - below 15 points**

Name: _____ Date: _____

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

Information sheet 2	Following Safety rules on chemicals Storage areas

2.1 How to store chemicals:

- Store all chemicals by their hazard class and not in alphabetical order. Storing chemicals by alphabetical order will often result in the placement of incompatible chemicals being next to one another.
- Storing chemicals by compatibility means for example that oxidizers should be separated from organics, air/water reactive must be kept dry and inorganic cyanides should be stored away from acids.
- Volatile toxic substances should be *stored in ventilated storage* cabinets.
- Chemicals which are highly toxic or other chemicals whose containers have been opened must be in unbreakable secondary containers. For example, place containers of concentrated acids or bases into plastic tubs to help contain any leakage.
- Do not store chemicals near heat sources such as ovens or steam pipes. Also, *do not store chemicals in direct sunlight.*
- Containers must be kept closed at all times.
- Do not store any chemicals in glass containers on the floor.
- Date chemicals when received and first opened. This will assist you in using the oldest chemicals first, which will also decrease the amount of chemicals for disposal.
- Inspect your chemicals routinely for any signs of deterioration and for the integrity of the label. All chemicals must be clearly labeled.
- Chemicals that require refrigeration must be *sealed* with tight-fitting caps and kept in lab safe refrigerators. Lab safe refrigerators/freezers must be used for cold storage of flammables.

- *Do not store chemicals above eye level*. If the container breaks, the contents can fall onto your face and upper body.

- Do not store excessive amounts of chemicals in the lab. Buying chemicals in large quantities creates a serious fire hazard and limits work space. The disposal costs far exceed any cost savings from large quantity purchasing.

For success in chemical storage, use these *criteria:*

- Small amounts, not stockpiled
- Secure
  - Do not overcrowd shelves.
  - Do not store too high; provide a proper kick stool or ladder where necessary.
  - Store solvents in a proper flammable liquids cabinet, and keep door closed.
  - Use appropriate containers for solvents and waste.
  - Store highly toxic or controlled materials in a secure or locked cupboard.
- Signed properly (labeled)
  - Label contents clearly.
  - Do not overwrite labels.
  - Label and regularly check peroxidizable materials.
- Sealed
  - Keep solvent containers closed.

Ensure chemical containers are intact. (If not, replace.)

Self-Check 2	Written Test

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1: describe How can store chemicals. (5 pts)

2: Mention where chemical is not stored. (5 pts)

3: Putdown and explain the *criteria* of chemical storage (5 pts)

Note: **Satisfactory rating - 15 points and above** **Unsatisfactory - below 15 points**

Name: _____ Date: _____

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

Information sheet 3	**Using appropriate personal protection equipment on chemicals Storage areas**

3.1. **Personal Protective Equipment**

Head protection

Head protection, in the form of *a hard hat,* will ensure safety against falling objects such as packages, drums, etc. and, to some extent, against accidental pesticide splashes. The hard hat should be *made of integral plastic, glass-reinforced plastic or aluminum alloy, and have a shell* with adequate impact strength and suitable ventilation holes. The headband cradle should be adjustable. Hats should be cleaned at the end of each work shift.

Respiratory protective equipment

Respiratory protective equipment may be of one of two main categories:

(a) ***Filtering devices*** such as mechanical filter respirators or chemical cartridge or canister respirators; and

(b) ***Self-contained breathing apparatus*** and supplied air-apparatus such as airline respirators.

Footwear

Footwear of a suitable type is essential. *Boots or shoes* should be made of rubber or other suitable material and have *stout non-skid soles*; a reinforced steel toecap is advisable since falling objects are a widely encountered hazard.

Working clothes

Working clothes should combine adequate protection with comfort and freedom of movement. They should be simple in design and preferably *free of external cuffs or open pockets* in which hazardous subjects can accumulate. They should have long sleeves and cover as much of the body as possible. Clothing for use in hot, humid

environments should be light in weight and allow air movement, whilst not permitting vapors or mists to affect the body.

Fig 3.1 Personal Protective Equipment

you can do many things to protect yourself when working with hazardous chemicals.

Proper Laboratory Clothing

- Wear long sleeved shirts.
- Wear closed toe shoes.
- Wear a laboratory coat or apron.
- Cotton is the preferred fabric for a lab worker since many synthetic fibers are flammable and may increase the severity of a burn.

Proper Eye Protection

- Safety glasses with side shields offer the minimum protection acceptable for regular use.
- When working with highly caustic liquids, large volumes of liquids *(spill/splash danger)* or flying particles splash goggles or face shields must be worn.

Proper Glove Selection

Gloves are a simple and effective way to protect yourself whenever handling hazardous chemicals, sharp objects, hot/cold materials, toxic chemicals and chemicals of unknown toxicity. Selection of the proper gloves is very important since *no glove material is impermeable to all chemicals.*

- Understand the hazards of the chemicals that you work with and choose a glove material that is known to be resistant to permeation by the substance(s) being used.
- If appropriate, wash gloves before removing them (some gloves are water permeable).
- Replace gloves periodically.

Self-Check 3	Written Test

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1: which types of PPE is used in chemical storage area. (5 pts)

2: Mention the types of PPE (5 pts)

Note: **Satisfactory rating - 10 points and above Unsatisfactory - below 10 points**

Name: _____ Date: _____

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

Information sheet 4	Following Procedures in the event of an accident or spillage

4.1. Emergency procedures

What is a workplace emergency?

A workplace emergency is an unforeseen situation that threatens your employees, customers, or the public; disrupts or shuts down your operations; or causes physical or environmental damage. Emergencies may be natural or manmade and include the following:

- Floods, Hurricanes, Tornadoes,
- Fires,
- Toxic gas releases,
- Chemical spills,
- Radiological accidents,
- Explosions,
- Civil disturbances, and

Emergency Equipment Checklist

The following emergency equipment must be located within or near the lab. Know the location and operation of the following:

1. Dry chemical fire extinguisher;

2. Eyewash;

3. Emergency shower;

4. Stocked first aid kit;

5. Evacuation route map (posted); and

6. Emergency response instructions (Center Emergency Guide).

*W**arn others.***

- Call if there is a medical emergency or danger to life, health or the environment.
- Alert people nearby.

Isolate the area.

- ⌘ Restrict access to those involved in the spill cleanup.
- ⌘ Determine the extent of the spill.
- ⌘ Keep doors closed.

Monitor yourself carefully and completely.

- ✪ Check yourself for any chemical contamination or signs/symptoms of exposure (e.g., wet clothing, skin or respiratory irritation).
- ✪ For medical emergencies, follow directions under

Stay in or near the area until help arrives.

- ❍ Minimize your movements. Avoid spreading contamination to other areas.
- ❍ Have a person who is knowledgeable about the incident be available to talk to or assist Emergency Personnel.
- ❍ Notify your Work Lead.

Chemical Spill Cleanup Requirements:

You can clean up a chemical spill if ALL ***of the following requirements are met:***

- ⇨ There is no potential for release to the environment. NOTE: Care must be taken to avoid spreading or tracking chemical contamination to other areas.

- ⇨ The cleanup procedures are known and you have the proper spill cleanup materials.
- ⇨ You have the ***proper PPE to protect*** yourself during the cleanup.
- ⇨ Two people can clean the spill up thoroughly within an hour.
- ⇨ If ALL of the above requirements are not met, or if you have any DOUBTS about your ability to safely and effectively clean up the spill, then:

    - ✓ Leave the immediate area,
    - ✓ Close the door,
    - ✓ Review these guidelines periodically—you must be familiar with them and know what to do before a spill occurs.
    - ✓ Understand the hazards of the chemicals you use. Consult the Material Safety Data Sheet

Personal Injury from or Exposure to Chemicals

Personnel are required to know the hazards and controls of chemicals in their work area. This *includes emergency First Aid procedures for inhalation, skin/eye contact, ingestion, and injection.* Material Safety Data Sheets should be consulted for this information. The Specific Controls and Procedures Section has additional measures for agents such as acids, bases and reactive metals.

In general, adhere to the following procedures for accidental exposures:

- ***Inhalation***: If the material or its reaction/combustion products are inhaled, remove the person from the area and transport to Health
- ***Skin or eye contact:*** Flush the affected area for at least 15 minutes. Then immediately report to Health Services
- ***Ingestion***: If spontaneous vomiting appears imminent or occurs, help the person keep a clear airway. If victims are unconscious or cannot sit up, turn them on their side to help avoid possible aspiration of vomits. Never give liquid to a person showing signs of sleepiness or who may become unconscious.

- ***Injection:*** This can occur from lacerations and punctures when handling sharps that are contaminated with chemicals. First stop the bleeding. Minor cuts and scrapes usually stop bleeding on their own. If they don't, apply gentle pressure with a clean cloth or bandage. Rinse out the wound with clear water. Soap can irritate the wound

Emergency Eyewashes and Safety Showers

Plumbed emergency eyewashes and safety showers must be provided in areas where splash hazards to corrosives, eye irritants, or chemicals that are toxic via skin and/or eye contact exist. They must be installed in the immediate work area at a location that can be reached by a blinded employee in an uncomplicated and unimpeded path within 10 seconds (approximately 50 feet).

The location of each emergency eyewash safety shower will be *posted with a highly visible sign.* Eyewashes and showers shall be vertically aligned to allow the eyes and body to be flushed simultaneously. Access to these facilities must remain open and free from obstructions at all times.

Fire Extinguishers

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Fig 4.1 Fire Extinguishers

Fire extinguishers are to be used only by trained personnel who are confident that they can fight the fire safely. If the fire is too large or too dangerous, leave the building and pull the fire alarm on your way out.

Your safety should always be your primary concern. Before deciding to fight a fire, be certain that you:

Alert people in the area and activate the nearest fire alarm.

- Are trained on how to use a fire extinguisher (training must be current).
- Are confident that you can fight the fire safely.
- Know what is burning so that you can select the correct extinguisher.
- Know the fire won't block your exit if you can't control it. A good way to ensure this is to keep the exit at your back.

Self-Check 4	Written Test

Name: _____ Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What and why is personal protective equipment (explain with examples? (5pts)
2. Write the S.W.I.M.S procedures of chemical spill or accidents? (5pts).
3. What are the cleanup requirements of chemical spills? 5 pts)
4. Differentiate hazard, toxicity and emergency (5 points)
5. What will you do, if fire hazard happen in your occupational area due to flammable chemicals? (5 pts)

Note: **Satisfactory rating - 20 points and above Unsatisfactory - below 20 points**

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

Operation sheet 1	Following Procedures in the event of an accident or spillage

Objectives

- ✓ To reduce the side effect of chemical
- ✓ To handle chemicals properly
- ✓ To protect peoples from chemicals spillage

Material required

- MSDS
- Clean waters
- chemicals
- PPE
- first aid kit
- Fire Extinguishers

Methods Following Procedures in the event of an accident or spillage

Procedures

1. Protect yourself by wearing appropriate protective clothes and equipment
2. Keep people (victim) away from any further spillage
3. Have current labels and material safety data sheets (MSDS) available
4. Assemble a first aid kit with necessary supplies
5. Always have a source of clean water
6. If oral or dermal exposure occurred, the first objective is usually to dilute the pesticide and prevent absorption
7. If inhalation exposure occurs, first protect yourself and then get the victim to fresh air immediately
8. Never give anything orally to an unconscious person
9. If the spillage involves a significant volume notify to local emergency services

LAP Test	Practical Demonstration

Name _____ Date: _____

Time started: _____ Time finished: _____

Instructions:

1. You are required to perform any of the following:

   Task 1. Handle chemicals

   Task 2. Use PPE

   Task 3. Show the procedure of event of an accident or spillage

Reference

1. file:///C:/Users/Get/Desktop/acs-secondary-safety-guidelines.pdf
2. https://mospace.umsystem.edu/xmlui/bitstream/handle/10355/11339/EHSNotesSpring11.pdf?sequence=1&isAllowed=y
3. https://sunypoly.edu/sites/default/files/Research/Contractor%20Forms%20and%20Training/EHS00005%20R12%20Chemical%20Handling%20and%20Storage_0.pdf
4. https://www.google.com/search?q=recognizing+and+observing+instructions+for+chemicals+pdf&sxsrf=ACYBGNQjLgoKfV7cv9kDP5hCW2YbhOoOeQ:1577427413445&source=lnms&tbm=isch&sa=X&ved=2ahUKEwiVooyFl9XmAhULGuwKHdCWAtsQ_AUoAXoECAsQAw&biw=1093&bih=501#imgrc=ZNgH7yDwACJC5M:
5. https://www.efsa.europa.eu/en/topics/topic/pesticides
6. https://www.daf.qld.gov.au/__data/assets/pdf_file/0009/54738/agricultural-chemical-users-manual.pdf

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Profile of trainers participate on special Horticultural Crop Production TTLM development for level I at Adama 2019