Mineral Resources Infrastructure Work Level I

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Module Title: - Planning and organising own work

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LG #24	LO #1- Plan and prepare for work

Instruction sheet

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

- Understanding organizational procedure
- Accessing, interpreting and applying compliance document
- Identifying and clarifying employment conditions, responsibilities and obligations
- Obtaining, confirming and applying work instructions
- Planning work activities
- Inspecting and preparing work areas in coordination with others
- Showing initiative in adapting to changing work conditions
- Selecting serviceable tools, plant and equipment
- Rectifying and reporting faults
- Identifying appropriate materials
- Handling materials safely
- Identifying and applying regulatory specification for Environmental protection
- Applying project environmental management plan

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Understand organizational procedure
- Access, interpret and apply compliance document
- Identify and clarify employment conditions, responsibilities and obligations
- Obtain, confirm and apply work instructions
- Plan work activities
- Inspect and prepare work areas in coordination with others
- Show initiative in adapt to change work conditions
- Select serviceable tools, plant and equipment
- Rectify and report faults

- Identify appropriate materials
- Handle materials safely
- Identify and apply regulatory specification for Environmental protection
- Apply project environmental management plan

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” and sheet 5.
4. Accomplish the “Self-check 1, and Self-check 2” in page 9, and 10 respectively.

1.1 Planning

Planning is concerned with 'what', 'how, and 'when' of performance. It is deciding in the present about the future objectives and the courses of action for their achievement. It thus involves:

- Determination of long and short-range objectives;
- Development of strategies and courses of actions to be followed for the achievement of these objectives.
- Formulation of policies, procedures, and rules, etc., for the implementation of strategies, and plans.

1.2 Organizing

Organizing : Organizing involves identification of activities required for the achievement of enterprise objectives and implementation of plans; grouping of activities into jobs; assignment of these jobs and activities to departments and individuals; delegation of responsibility and authority for performance, and provision for vertical and horizontal coordination of activities.

1.3 Organizational procedure

Planning and organizing work is the key to ensuring a safe, efficient and effective work output. If you are disorganized, chances are you will feel overwhelmed by your work. Time management is fundamental to organization.

It involves:

- Looking at the task to be completed
- Working out the time it will take
- Deciding on the type of equipment and materials to use
- Delegating parts of tasks / services to others
- Allowing for any possible problems or risks that might occur

Self-Check – 2	Written test

Directions: Answer all the questions listed below

Test I:Choose the correct answer for the following question

1.A process concerned with 'what', 'how, and 'when' of performance is? (2)

A. Controlling B. Planning C. Directing D. None

2. Planning and organizing work involves(2)

A.grouping of activities B. delegation of responsibility C. Assigning of task D. All

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 4 points**

Answer Sheet

Name: _____ Date: _____

Short Answer Questions

TEST I.

1. _____

2. _____

Information Sheet 2- Accessing, interpreting and applying compliance document

2.1. Compliance documentation

Compliance documentation is the documents that must be completed in a job. These documents are required to show that the workplace is following the established laws, set practices and standards that must be in place.

It is not about you might complete; it is not about you'll finish them later; it is not about you'll work on if you have time! Compliance documents are documents that must be read and followed and in some cases completed by you.

It is not about you might complete; it is not about you'll finish them later; it is not about you'll work on if you have time! Compliance documents are documents that must be read and followed and in some cases completed by you.

Failing to follow and work correctly with compliance documents may lead you to lose your job. In workplaces where there are inherent dangers around you, if you do not follow the rules you can expect to be looking for another line of work!

2.2. Legislation

Legislation are the formal rules and laws set by governments.

The following regulations, procedures, standards and safety considerations may apply to planning and organize your work activities:

- Mining Act and Regulations mining regulation **678/210, as Amendeded 816/2013**
- Environmental Protection Act(1997)
- Equal Employment Opportunity and Disability Discrimination legislation
- Employment and workplace relations legislation
- Duty of care
- Code of Practice
- Occupational Health and Safety legislation
- Ethiopian Standards

- Manufacturer's specifications and recommendations
- Site specific regulations and procedures

Dfference between an Act and a Regulation?

An **Act** is passed by Parliament and provides the ***framework*** which deals with administration, management, inspection, areas of responsibility, duties and penalties, i.e. for Ministers, Inspectors, Mine Managers. Acts are LAW.

Regulations are an Act passed by Parliament and details the specific elements, such as regulations concerning the use and operation of mobile lighting plant, the levels of a specific chemical that can be found in the air within a mine, etc. They are the ***minimum standard*** to be complied with. Regulations are also law.

Every person owes an obligation. To discharge their obligation, each person must act in a manner, which shows consideration to other people and property, i.e. to act in a manner, which a reasonable person (with such training/and or experience) would consider fair, just and safe.

If you act negligently in an inadvertent manner, i.e. you do not think about how you act or the consequences, you will be liable. If you act negligently in a reckless or wilful manner, i.e. you deliberately decide to act in a manner, which is likely or calculated to cause damage/loss, you will be liable, and may be charged with a crime in certain circumstances (insurance does not cover you for such acts).

Self-Check – 2	Written test

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

Test I: Choose the correct answer for the following question

1. Documents which show workplace laws, set practices and standards are?

   A. Compliance documents B. Planning documents C. Task documents D. All

2. formal rules and laws set by governments

   A. Job B. Legislation C. Ethics D.none

3. An Act is passed by Parliament and provides the framework which deals:

   A. administration B. management C. Responsibility D.All

4. Common law is the set of laws that are formed, not from government (i.e. statute law), but from past judgments in courts and judicial decisions.

A. True B. False

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 2 points**

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

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Test I

1. _____
2. _____
3. _____
4. _____

Information Sheet 3- Identifying and clarifying employment conditions, responsibilities and obligations

3.1. Employment conditions

Your employment conditions are set by the award that is used in your industry. The award outlines your hours of work, pay rates, leave entitlements, allowances, etc. Your position description will also outline what your employer's expectations are of you. These are valuable sources of information during the planning phase of a work task ensure that you are working within your parameters of your obligations.

Figure 3.1 Employment condition

3.2 Duties of workers

Through the awards, regulations and other forms of law broad expectations or duties of workers have been set. Any worker however regardless of the industry they work in or where they are working, has a common set of duties:

3.3. Accountability

Accountability is defined as ***"being responsible to somebody or for something".***

In a work sense, accountability is about being true to your word and meeting all of your responsibilities. It is also about being true to yourself and your personal expectations of doing a good job.

Accountability is an individual value. Real accountability cannot be forced; it must be voluntary. Your accountability is really up to you, but you will be judged by other workers and the bosses on how you demonstrate your accountability.

There are three elements to personal accountability:

1. Honesty

Be honest with yourself about your reasons and motivations for your actions. Be clear about the consequences and accept them graciously.

2. Responsibility

Once you have gotten a handle on being accountable to yourself, begin accepting responsibility when and where it is deserved. At the same time, do not be afraid to assign responsibility if it truly belongs to someone else. It can be hard to take the high road and be accountable for your actions, particularly if others around you don't choose the same path. It is not your place to preach or judge others, but you should act assertively and ask that they take responsibility for their actions.

3. Assertiveness

Assertiveness is a word we tend to use without really understanding what it means. We sometimes picture assertive people as being inconsiderate and very demanding. Rather, assertive people express their feelings, needs, and opinions in a forthright manner. However, they are not abrasive; that is the hallmark of the aggressive person.

- **Addressing your obligation**

Every person owes an obligation to others under common law. To carry out their obligation, each person must act in a manner, which shows

consideration to other people and property. This means that they are judged on their behavior against that which a reasonable person (with such training/and or experience) would consider fair, just and safe.

If you act negligently in a manner without due thought or regard, i.e. you do not think about how you act or the consequences, you could be liable. Being liable means that you are responsible for the damage or hurt that occurs.

If you act negligently in a reckless or wilful manner, i.e. you deliberately decide to act in a manner that leads to injury or damage to others, which is likely or calculated to cause damage/loss, you will be liable, and may be charged with a crime in certain circumstances. Also insurance does not cover you for such acts.

Self-Check -3	**Written Test**

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

Test I Define the following

1. Honesty _____ (2)
2. Assertiveness _____ (1)
3. Responsibility _____ (1)
4. Being accountable _____ (1)

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 4 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

Test I

1. _____
2. _____
3. _____
4. _____

Information Sheet-4- Obtaining, confirming and applying work instructions

4.1. Work instructions

When planning any work you must take into account your duty of care obligations and the policy and procedures of your workplace. You must make sure your conduct is safe and does not place others at risk. The task requirements will be outlined in your work instructions for that job. Generally these instructions will be provided by your immediate supervisor, the team leader, site manager or other person in direct authority.

Work instructions should provide employees with the following basic information:

- The purpose of the job
- The work activity to be done and sequence of tasks

- Hazard assessment
- Emergency requirements
- PPE requirements
- Time frames
- Priorities

- **Forms of instruction**

Work instructions can be received by you or your work team in several different ways. The most common ways of receiving work instructions in a mining or construction workplace are:

- **Written documentation**

A written document means a document with text that provides information on an official work related matter. It may include reports, memos, letters, manuals, service standards and directives.

- **Verbal instructions**

Verbal instructions are the instructions, directions and orders that are given to you through voice, i.e. the boss tells you what to do!

- **Team meetings**

A team meeting is when the members of your work team are gathered together to receive instructions about the work tasks, report back on the team's progress on various jobs and to learn about what is happening in the immediate future on the work site.

- **Plans / specifications**

All the drawings and documents detailing a job including the construction, mechanical and electrical drawings as well as a list of all the materials required. It would also include written instructions to the builder for materials, workers or team leader.

Self-Check -4	**Written Test**

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

1. **List and define** the most common ways of receiving work instructions(3)

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

Test I

Information Sheet-5	**Planning work activities**

5.1 Planning work activities

Management function that involves setting goals, establishing strategies for achieving those goals, and developing plans to integrate and coordinate work activities.

When you understand the task, you can create a plan. A job plan must cover all parts of the work and should:

• Break down the job into individual tasks

• Identify the equipment needed to perform each task

• Define the safety requirements for each task

• Set a timeframe for job completion

By planning your job ahead you will make sure that all resources you need to complete the job safely and on time are available.

5.3 Work schedule

5.2 Standard work procedures

A standard work procedure is the result of organizing tasks in the best sequence of steps to make the best use of people, equipment, tooling and materials. It's not that we want to turn every worker into a robot, but we do want everyone to follow recognized best practices

A **work schedule** refers to the specific days and hours designated to an **employee** for paid **work**. It includes the details of your specific **shift**, including which days of the week and hours of the day you're expected to **work** for a company.

Table 5.1 work schedule example

S/N	Planned Activities	Unit	Qty.	Months							
				1	2	3	4	5	6	7	8
1	Data Compilation										
2	Satellite Image Interpretation										
3	Geological Mapping 1:50,000	Km^2	3.6826								

4	Section Logging	m	500									
5	Rock Sampling & Channel Sampling	Pcs	100									
6	Sample Analysis Petrography, for ash content, sulfur content, calorific value, etc.		20									
7	ESIA Baseline Study											
8	Reporting Writing											

Self-Check -5	**Written Test**

I. Short Answer

5. What is Planning ?
6. What is Standard work Procedures?

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-6	Inspecting and preparing work areas in coordination with others

6.1 Inspection of work area

- **Inspection**

An inspection is, most generally, an organized examination or formal evaluation exercise. In engineering activities inspection involves the measurements, tests, and gauges applied to certain characteristics in regard to an object or activity.

There are various methods of preparing a work plan that will ensure compliance with site procedures and safe work outcomes.

An informal risk assessment is one of these and may be described as a simplified way of identifying hazards associated with a particular type of work, and putting in place control measures. This informal risk assessment process may only require a simple tool, such as recording the hazard in a pocket note book, and a set of processes.

There are a number of risk assessment processes used however in the mining and construction industries, a common process is the SLAM.

SLAM = STOP, LOOK, ASSESS AND MANAGE

S.L.A.M.

The S.L.A.M method of risk management is a proven, effective and simple system employed by mining companies and businesses around the world.

This simple risk management strategy works because it follows a simple, logical sequence. It doesn't involve reams of paper yet it provides documented and verifiable evidence that health and safety risks have been identified and controlled within a work site.

- **STOP**

Begin the Job plan with risk assessment. Ask yourself five important questions:

How can I be injured?

How can others be injured?

How can equipment be damaged?

What is the safest, most productive, highest-quality way to accomplish the task?

What information do I need?

Consider the following: surroundings/ environment, equipment/tools/parts, skills required, assistance needed, changes from previous experience, and procedures/job safety analyses (JSAs)/regulations.

- **LOOK**

After stopping, the employee must ***look*** for energies or specific hazards created through the interaction of the human, the machine and the environment. This review includes ergonomic and health hazards in the workplace that have the potential to cause accidents and injuries.

- **ASSESS**

The employee must then ***assess*** the risks and rate them according to the risk matrix.

Based on the hazards identified in the **LOOK** phase, the employee assesses the consequences and the likelihood of their occurrence and determines the level of risk to which he or she will be exposed in performing the task.

- **MANAGE**

The employee must then ***manage*** all risks to *As Low A Level As Reasonably Possible* (ALARP) with current and/or additional controls. Reduce the consequence through:

  - Reducing energy - electrical; mechanical (motion, spring, etc.); chemical; thermal; gravity; noise; etc.
  - Isolation and guarding - mechanical, PPE.

Reduce the likelihood through:

- knowledge and skills,
- job planning with risk assessment,
- procedures with JSAs,
- effective tools and processes.

Controls include the elimination of the hazard; substitution or redesign; training, planning and management; and guarding or PPE.

- **Daily S.L.A.M.**

Workers on site should undertake this kind of assessment at least on a daily basis, or when starting a new job. If you were setting up monitoring processes for quality and the environment you may consider the following:

- Are there existing monitoring systems/procedures?
- What needs to be monitored?
- How is this best achieved?
- What is the frequency of monitoring?
- Who is best placed to monitor?
- Does the monitoring process allow for changing circumstances?
- How are findings/feedback managed/responded to?

- **SAM**

Remember that in any workplace, it is far better to take precautions to prevent accidents and illness from occurring than it is to take action after an accident.

There are many simple ways to remember about your responsibility with hazards and risks. Any of the simple approaches are worthwhile, e.g. SAM.

A similar approach to SLAM is the three steps that are a sound guide to preventing

- Spot the Hazard
- Assess the risk
- Make the changes

SAM is formed from the first letter of each stage... \

S - Spot the Hazard

This is also known as Recognise the Risk. It is important that hazards in the workplace are identified. This is generally the role of the employer, WHS representatives and workers.

In a work situation, hazards might include:

- Environment hazards such as poor lighting, temperature too hot or cold, inadequate equipment such as non-ergonomically designed chairs or poorly maintained lifting gear and lack of appropriate work area.
- Chemical hazards such as toners from photocopiers, acetone from painting and cleaning materials.
- Biological hazards such bacteria from poor hygiene practices in the workplace.
- Risks of Occupational Overuse Syndrome
- Psychological hazards such as poor work organisation, too great a workload and stress.
- Electrical hazards from work equipment.

A - Assess the risk

Once a hazard has been identified, it is important to assess the seriousness of the situation. All risks should be reported and other staff made aware of the risk. Serious risks should be reported to management immediately.

Once a hazard has been identified, it is important to assess the seriousness of the situation. All risks should be reported and other staff made aware of the risk. Serious risks should be reported to management immediately.

In serious instances OHS representatives may issue in writing Provisional Improvement Notices to employers for serious OHS concerns. The employer must then take appropriate action to fix the situation. In very serious cases, OHS authorities may issue Improvement or Prohibition Notices to employers where there has been a clear breach of the law. Employers are given a set time limit to fix the problem.

M - Make the changes

Make the Changes is also known as Control the Risk.

Once a hazard has been identified and reported in the workplace, it is important to take the necessary steps to control the risk. This might include:

- Removing the hazard from the work environment
- Replacing the hazard with a safer alternative
- Improving the organisation of work routines
- Improving workplace layout
- Making changes to the workplace
- Training of employees in risk minimization

Self-Check -6	Written Test

II. Define the following

SLAM = STOP, LOOK, ASSESS AND MANAGE

1. Stop_____
2. Look_____
3. Assess_____
4. Manage_____

Information Sheet 7	Showing initiative in adapting to changing work conditions

Work plans are based upon information known at the time and possible conditions in the future, however an unforeseen event or operational constraint may mean the work plan cannot be maintained.

You must be flexible enough to manage problems that occur and get the job done as efficiently and safely as possible.

Some examples of events that cause a deviation from the work plan:

- Equipment breakdowns or malfunctions
- Interruptions to supply and quality of feed etc
- Changes in weather
- Occupational health and safety issues
- Problems during start up and shutdown
- Employee absence

Example

A severe storm affected one of my work tasks. The heavy rainfall resulted in slippery road surfaces which quickly become unsafe. It also brings about boggy conditions and slowed down completion of my team's work.

The changing needs and conditions meant that operational conditions had to be changed. These included lowering the expected results of the work, adjusting the time to start and complete the job and of course the finished job wasn't up to our normal standard of workmanship.

The only good thing was that I had prepared a Plan B!

7.2 Changing needs and conditions

When changing needs or conditions are identified it is essential that the implications of these are discussed with the operations team. A decision will have to be made as to whether to proceed with the present conditions.

An operator must be able to seek assistance from the appropriate personnel when difficulties arise.

Difficulties may arise from a particular task or breakdown of equipment, where the required output cannot be maintained or quality may be affected. Generally, the operator can obtain assistance from personnel such as the Control room operator, Shift supervisor, Maintenance personnel or the site's Safety Officer.

- ***Keep people informed***

An operator must inform the control room operator or shift supervisor of any difficulties that may arise and any immediate actions, so that they are kept informed of events. Inexperienced operators should always notify the relevant person first and discuss the situation with them.

After receiving instructions from appropriate personnel such as control room operator or shift supervisor as a result of changing needs or conditions, an operator must review the tasks and priorities in line with the changes in instructions. This is important because if the tasks and priorities are not reviewed serious consequences may result. It may also be necessary to change the order of certain tasks so they are in line with operational or maintenance requirements.

The proposed changes to work plans must be recorded in the appropriate reports such as process area logs, maintenance reports, etc. The shift handover meeting should be used to communicate any changes to work plans to the oncoming shift.

Self-Check -7	**Written Test**

Test I

1.Define Changes to work conditions_____

Information Sheet-8	Selecting serviceable tools, plant and equipment

8.1. Selecting tools, equipment and plant

Introduction

To produce products or services business systems utilize various facilities like plant and machineries, ware houses etc. Facilities can be broadly defined as buildings where people, material, and machines come together for a stated purpose – typically to make a tangible product or provide a service.

The facility must be properly managed to achieve its stated purpose while satisfying several objectives. Such objectives include producing a product or producing a service

- at lower cost,
- at higher quality,
- using the least amount of resources.

Facilities Planning

Importance of Facilities Planning & Design Manufacturing and Service companies spend a significant amount of time and money to design or redesign their facilities. This is an extremely important issue and must be addressed before products are produced or services are rendered.

A poor facility design can be costly and may result in:

• poor quality products,

• low employee morale,

• customer dissatisfaction.

• real estate brokers, and

• urban planners are involved in FP.

Plant selection

The principles of selection

The need for selection of construction equipment can arise from a number of situations, which vary according to the nature and size of the organization. During any construction work, there will be requirements for items of plant and equipment in order to carry out the work in a more cost-effective manner. This involves site staff initially in making a technical selection using the following criteria:

(1) Comparing mechanization with other more labour-intensive methods of working.

(2) Comparing alternative plant methods for a particular operation. Bulk earthmoving may be carried out either with tractors and scrapers or with lorries and loading shovels/excavators depending on the outputs required.

Tools and equipment Selection procedures

This selection process can be broken down into six separate stages:
(1) task identification;
(2) preliminary selection;
(3)machine output estimation;
(4) machine matching;
(5) outputcosting;
(6) final selection.

Self-Check -8	Written Test

Define the following

1. Facility planning_____

2. plant_____

3. Tools and equipments_____

Information Sheet-9	Rectifying and reporting faults

9.1. Reporting faults

Some jobs require paperwork to be done as part of the organisation's requirements. Paperwork is important for the following reasons.

- **It provides a record of work done**

  It gives the organization an overview of the cost and efficiency of the work and shows where most of the resources and effort have gone.

- **It helps to identify problem areas**

Problem areas or faults that are reported or repaired are identified from the reporting process. This helps to identify maintenance and quality issues, work procedures and equipment problems.

- **It helps monitor equipment performance**

Having a written history of the performance of equipment allows you to identify and avoid problems and take planned maintenance action to prevent downtime. Regular performance monitoring also allows you to make adjustments where and when it is necessary to maintain efficiency.

Types of documents

The types of documents used to collect this information might include:

• Shift reports
• Log books
• Timesheets
• Pre-start checklists
• Maintenance checklists

Self-Check -9	**Written Test**

I. Define the following

1. List and Explain the Paperwork in the reporting fault_____

Information Sheet-10	Identifying appropriate materials

10.1. Materials

A material is a substance or mixture of substances that constitutes an object. Materials can be pure or impure, living or non-living matter. Materials can be classified based on their physical and chemical properties, or on their geological origin or biological function.

- The material that can be used in planning may include:

- ✓ File folder
- ✓ Paper
- ✓ Different furniture, like chair, table…
- ✓ Lab materials
- ✓ Site materialsetc

Information Sheet-11	Handling materials safely

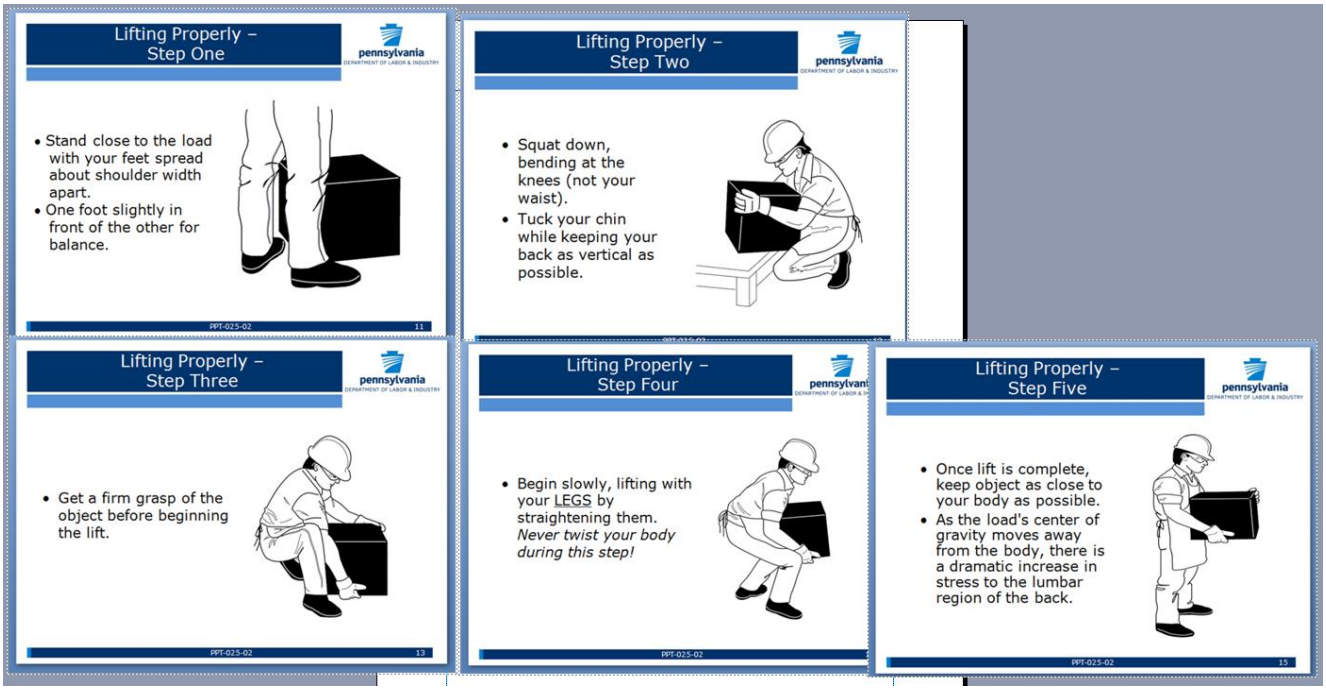
Layout of Work Area

- The layout of work areas can be arranged to prevent awkward postures such as bending, twisting, and overreaching
- Work surfaces should be at waist height, or height-adjustable, to prevent bending
- There should be sufficient space to turn around and prevent twisting
- Materials that will be manually lifted should not be stored directly on the floor

- Frequently used and heavy items should be stored between knee and waist height
- Elevated platforms or step stools should be provided to reach items above chest level

S.M.A.R.T. Lifting Technique

- ***Size up the load***
  - Assess the size, weight, and shape. Remove obstacles from the load (such as loose wrapping materials).
  - Assess whether the load actually needs to be moved
  - Where is the load going to be placed? Remove obstacles from your path.
  - Determine whether mechanical or assistance from a co-worker is required
- ***Move the load as close to your body as possible***
  - Stay close throughout the lift
  - The whole hand should be used to ensure a firm grip
- ***Always bend your knees***
  - Maintain balance
  - Keep feet apart and in a comfortable position
  - Minimize bending at the waist
  - Bend your knees to a semi squat
- ***Raise the load with your legs***
  - Lift smoothly, without jerking
  - Maintain the normal curve of your spine throughout the lift
  - Tighten the abdominal muscles and exhale while lifting
- ***Turn your feet in the direction that you want to move the load***
  - Avoid unnecessary bending, twisting, and reaching
  - Change direction by turning your feet and not your back
  - To set down a load, squat down and keep your head up. Let your legs do the work



Team Lifting

- Team lifts are appropriate if:
  - The load is too heavy for one person
  - The load is large, bulky, or oddly-shaped
  - You feel uncomfortable lifting the load by yourself (and do not have the proper equipment)
- Whenever possible, team member should be of around the same height and build. If this is not possible, taller members should be at the back.
- Designate a lift leader, who:
  - Plans and coordinates the lift
  - Provides simple and clear instructions
  - Ensures that you lift and lower the load together
- Assess the weight of the load
- Follow the S.M.A.R.T. lifting technique
- The lift leader should ensure that all team members are comfortable once the load has been lifted. If not, the load should be carefully lowered.

Overhead Loads

- Always use a stool or ladder to lift loads above chest level
- Test the weight of the load before removing it from the shelf
- Slide the object toward you, to the edge of the shelf
- Hold the load close to your body as you lower it

Awkward loads

- Sometimes different lifting techniques need to be adopted to move awkward loads

Over-sized or Odd-shaped

- In many cases, oversized loads may be light enough to carry, but block vision or may be difficult to hold. In such cases, use mechanical assistance or seek help from a co-worker.

Long, light objects

- Support the load on your shoulder
- Keep the front end higher than the rear

Pushing and Pulling

- Keep your back straight, avoiding excessive bending or twisting
- Use your legs to push or pull
- Keep the load as close to your body as possible
- When using mechanical aids to push and pull, the handles should be positioned at a height between the shoulder and waist

- When pushing on a slope or ramp, ask for assistance whenever necessary. Keep in mind that the incline can significantly increase the forces
- Uneven loads also require increased push and pull forces; seek appropriate assistance when necessary

Self-Check -11	**Written Test**

I. **Define the following**

1. Material handling_____ (2)
2. Team lifting_____ (2)
3. Lifting techniques_____ (3)

Information Sheet-12	Identifying and applying regulatory specification for Environmental protection

12.1. Definition of Environmental Protection

Environmental protection can be defined as the prevention of unwanted changes to ecosystems and their constituent parts. This includes the protection of ecosystems and their constituent parts from changes associated with human activities; and the prevention of unwanted natural changes to ecosystems and their constituent parts.

12.2. Environmental protection requirements

12.2.1 Alleviation Measure for the Control of Mining Activities on Water Resource

12.2.2 Controlling of Water pollution

Mining activities will almost always have an impact on water environment through direct or indirect contact of either the surface or groundwater. Therefore, industries

must invest in ensuring that water is not contaminated or where contamination does occur, they invest in treatment or containment within appropriate reservoirs, pipelines, canals or other storage facilities. Mining industries must encourage adopting practices and technologies which are environment friendly. The practice that must be followed by the industries is as follows as highlighted by; Resource conservation and management by scientific way with minimum waste;
Finding substitutes of the mineral widely used at present;

- ✓ Proper recycling of used material.
- ✓ Adoption of environmental friendly technologies.
- ✓ Efficient and efficient use of energy.
- ✓ Forestation and preservation of biological diversity.
- ✓ Government should not permit mining operation in ecologically sensitive areas.
- ✓ Follow Acts, Rules and Regulation made by Ministry of Environment, Forest and climate change
- ✓ Waste food material, paper, decaying vegetables and plastics should not be thrown into the open or underground drains.
- ✓ Effluents with high organic content and slurries from distilleries and industries should be sent to biogas plants for generation of energy.
- ✓ Oil slicks should be skimmed off from the surface with oil separators or suction devices. Sawdust may be spread over oil slicks to absorb the oil components and then the material is incinerated.

12.2.3 Control of Air Pollution

The following should be done to manage and control air pollution

- ✓ Use of better designed equipment and smokeless fuels, hearths in industries and at home.
- ✓ Automobiles should be properly maintained and adhere to recent emission-control standards.
- ✓ More trees should be planted along road side and houses.
- ✓ Renewable energy sources, such as wind, solar energy, ocean currents, should fulfil energy needs.
- ✓ Tall chimneys should be installed for vertical dispersion of pollutants.
- ✓ Encourage organic farming

12.2.4 Control of land Pollution

- ✓ Proper garbage disposal
- ✓ Recycle garbage
- ✓ Reduce use of herbicides and pesticides
- ✓ Over packed items
- ✓ Efficient utilization of resources and reducing wage

Self-Check -12	Written Test

I. Define the following

1. Pollution_____ (1)
2. Control of air pollution_____ (2)

3. Control of land pollution_____ *(2)*

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Question

Name: _____

LG #25	LO #2- Sequence work safely

Instruction sheet

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

- Understanding enterprise requirements
- Determining work plan to perform task
- Completing work documentation and/or reports

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 –**

- Understanding enterprise requirements
- Determine work plan to perform tasks in a logical, safe and efficient sequence
- Complete work documentation and/or reports to meet enterprise requirements

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, Accomplish the “Self-checks.
4. If you earned a satisfactory evaluation from the “Self-check” ask to your trainer for final assessment

Information Sheet-1	**Understanding enterprise requirements(identifying work plan sequence)**

1.1. Work plan

A work plan represents the formal road map for a project. It should clearly articulate the required steps to achieve a stated goal by setting demonstrable objectives and measurable deliverables that can be transformed into concrete actions.

- In work plan we have to know and understand the sequences
- ✓ Identify the Project Name, Purpose and General Timeline. ...
- ✓ Put Your Work Plan into Context. ...
- ✓ Establish Your Goals and Objectives. ...
- ✓ Define and Coordinate Your Resources. ...

- ✓ Understand Your Constraints. ...
- ✓ Discuss Risks and Accountability.

Self-Check -1	**Written Test**

I Define the following

What iswork plan _____ (2)

Information Sheet-2	Determining work plan to ensure tasks are performed

A work plan identifies the specific tasks that need to be completed. Additionally it defines the what, who, when and how of each of these actions. Finally, a good work plan lays out the monitoring tasks necessary for the project.

The process of completing a work plan will also help a team identify gaps in the availability of critical resources and capacity necessary to achieve objectives.

- work plan helps the project team to:
  - Ensure all the essential tasks in the project are planned and reduces the chance of overlooking an essential step in completing the project
  - Allocate tasks efficiently to individuals without duplication of effort
  - Establish short-term priorities and individual performance expectations
  - Establish a project schedule that can be tracked and monitored
  - Set expectations for project progress and establish accountability
  - Analyze problem areas more effectively
- The following five steps are typically carried out during the process of developing a useful workplan:

1. Identify specific action steps that need to be done
2. Define “who” will be responsible for each action step
3. Determine when each action step will take place
4. Estimate resources required for each action step
5. Revisit and revise the work plan on a regular basis

1. Identify specific action steps that need to be done

Developing a work plan starts by reviewing the various activities that you identified while developing strategies and measures and determining which of these need to be implemented over the current planning period. These can be compiled in a table- the list of your objectives, strategic actions, and monitoring needs. You then need to take each activity and think about breaking it down into specific action steps or monitoring tasks that will need to be completed to accomplish the activity.

- Each action step should be defined such that:
  - It has clearly identified beginning and end points,
  - The time and cost needs can easily be estimated,
  - Its progress and completion can be easily assessed,
  - It is distinct from other action steps.

2. **Define "who" will be responsible for each action step**

As you develop your action steps, it is also important to define who will be responsible for it across your project team members, consultants, and partners. The following factors should be considered when defining responsibilities for a task:

- Skills and knowledge required for the action step
- Availability of individual - does the person have the time to do the work?
- Individual's interest in the action step
- Organizational structure foreseen for the whole project
- Level of authority or positional power required for the action step
- Natural groupings of action steps

3. Determine when each action step will take place

The accuracy of a step's time estimate usually depends on whether you have done similar work in the past. Where this experience is lacking, sometimes you just need to accept this uncertainty and get on with the step. It is important to make the project schedule realistic and take into account everything from dependencies between action steps to holidays to other activities that project staff have to do.

4. Estimate resources required for each action step

As you develop each action step, you should also estimate the monetary cost of completing the step as well as describe any other resources that will be required. There are essentially four major types of costs associated with any activity:

- Labor
- Materials
- Other direct costs (travel, telephone etc.)
- Indirect costs (i.e. overheads - office rental, utilities, administrative costs)

5. Revisit and revise the work plan on a regular basis

As stated above, if a workplan is truly being used to guide a project's activities, then the project staff should be consulting regularly. It is also good practice, however, to make time to formally review and revise your workplan at least annually and perhaps quarterly. Workplans must be followed, updated and maintained to reflect an accurate picture of current status. In a multi-year project, you should produce a new workplan as part of your annual planning cycle.

Self-Check -2	**Written Test**

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

1. Explain th determining work plan (3)

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Information Sheet-3	Completing work documentation and/or reports

3.1 Documenting & Recording

Documents include all the written policies, processes, and procedures of the laboratory. In

3.1.1 Documents

order to develop laboratory documents, it is important to understand each of these elements and how they relate.

- **Differences between Documents and records**

Documents provide written information about policies, processes, and procedures.

The following are the characteristics of documents:

- communicate information to all persons who need it, including laboratory staff, users, and laboratory management personnel;
- need to be updated or maintained;
- must be changed when a policy, process, or procedure changes;
- Establish formats for recording and reporting information by the use of standardized forms. Once the forms are used to record information, they become records. Some examples of documents include a quality manual, standard operating procedures (SOP), and job aids.

Records are the collected information produced by the laboratory in the process of performing and reporting a laboratory test.

Characteristics of records are that they:

- Need to be easily retrieved or accessed;
- Contain information that is permanent, and does not require updating. Some examples of records include: completed forms, charts, sample logs, patient records, quality control information, and patient reports. Information is the major product of the laboratory, so manage it carefully with a good system for the laboratory's documents and records.

Self-Check -2	**Written Test**

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

2. Write the differences between documents and records?
3. Mention at least two characteristics of documents?

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

LG #26	LO #3- Resolve problems

Instruction sheet

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

- Identifying problems with work processes and suggesting improvement
- Modifying work processes

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 and suggest Problems with work processes for improvement
- modify Work processes to suit changes circumstances, after consultation with supervisor or other relevant personnel

Learning Instructions:

5. Read the specific objectives of this Learning Guide.
6. Follow the instructions described below 3 to 6.
7. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4” sheet 5,6,7,8,9,10,11,12
8. Accomplish the “Self-check 1-12.
9. If you earned a satisfactory evaluation from the “Self-check” ask to your trainer for final
10. assessment

Information Sheet-1	Identifying problems with work processes and suggesting improvement

1.1Resolving Problems

Problems with work processes

There will be days when things don’t go according to plan. You must be flexible enough to manage problems that occur and get the job done as efficiently and safely as possible. Things that you may need to consider have me worried...

- What happens if the weather changes?
- Is there a risk the power will go out?
- Is the equipment reliable or will it break down?
- What safety hazards will there be?
- Which team members might be absent?
- Between workers problem

Example

You are given a job to plan and carry out for next Friday. You need to think about any likely changes in weather conditions. Is it likely to rain, be hot, be cold, etc.

Some work cannot be done on wet or very hot days.
Rainfall can result in slippery road surfaces which can become unsafe. Heavy rainfall might also bring about boggy conditions and slow down completion of work.
Very hot days might mean that your work team cannot be out in the sun for extended periods.
By having a plan that allows for potential problems, you will stay a step ahead in getting the job done.

Fixing problems is much easier and more effective when you already have a plan in place for that purpose. For example, if you plan for a change in weather conditions and this occurs, then you will easily be able to change your work and get the job done efficiently.
Potential problems that you identify during the planning process are not the only ones to consider. You must also deal with any problems resulting from work procedures.

The purpose of having work procedures is to guarantee that employees work efficiently and safely. If you find problems with work instructions or procedures you must identify and report them so that poor and inefficient processes can be changed and improved. Modifications to work practices are not uncommon and should be encouraged in a safe and efficient work environment.

Information Sheet-2	Modifying work processes

2.1. Work change

Change involves the crystallisation of new possibilities (new policies, new patterns, new methodologies, new products or new market ideas) based on the reconceptualised patterns in the institution. The architecture of change involves the design and construction of new patterns, or the reconceptualisation of old ones, to make new, and hopefully more productive actions possible.

Organizations choosing not to engage totally in incremental change sometimes implement the following types of change:

- fundamental – the implementation of a standards-based approach which necessitates dramatic changes in the organization;
- transitional – this involves the slow evolution of the organization through the introduction of mergers, new processes or technologies; and
- Transformational – the organization rethinks its mission, culture, activities and critical elements of success.

Why change?

1. New technologies that have transformed communications, electronics, consumer markets and speeded up industries;
2. Globalisation, which has resulted in a world that is evermore connected and interdependent as information, money and goods move around the planet;
3. Globalisation and new technologies, which together have sharpened competition and precipitated the rise and fall of market leaders;
4. New change processes and practices, which are now happening faster than ever before in our known history;
5. Speed – an incredible increase in technological speed is matched in business (product life cycles are measured in months not years) and in people's lives (most of us feel we are running as fast as we can merely to stay in place); and
6. Complexity and paradox which are increasing as a result of all these changes and are making more and more difficult demands on managers used to seeking certainties and 'either/or' type solutions in order to bring about the ideals of stability and order.

Self-Check -2	Written Test

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

4. What is change_____
5. Write why to change_____

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

LG #26	LO #4- Clean up

Instruction sheet

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

- Clearing work area and disposing waste materials
- Cleaning, checking and maintaining machinery, tools and equipment

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 –**

- Clear and dispose recyclable materials correctly
- clean, check and maintain Machinery, tools and equipment

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, Sheet 4” sheet 5,6,7,8,9,10,11,12
4) Accomplish the “Self-check 1-12.
5) If you earned a satisfactory evaluation from the “Self-check” ask to your trainer for fina assessment

Information Sheet-1	Clear work area and disposing or recycling materials

1.1 clearing work area

If a mine site is located in a remote, undeveloped area, the project proponent may need to begin by clearing land for the construction of staging areas that would house project personnel and equipment. Even before any land is mined, activities associated with site preparation and clearing can have significant environmental impacts, especially if they are within or adjacent to ecologically sensitive areas.

1.2 Disposal of Materials by using (3R)

To reduce waste problems in future, reduction in waste generation and re-use of old products and possible reduction at the consumption level include better buying habits and cutting down on the use of disposable products and packaging. The following 3R are mostly used in waste prevention methods

1. **Reduce**: Buy only what you need because a better way to reduce waste is by not creating it.
2. **Reuse**: If you have to acquire goods, try getting used ones or obtaining substitutes.
3. **Recycle**: When discarding your waste, find ways to recycle it instead of letting it go to landfill.
    - Residual wastes which cannot be used by any means should be **disposed** properly.

1.1. Solid Waste from Mines

Waste rock and tailing, no matter which kind of development program was utilized in a mine, are the upper most solid waste in the duration of exploitation of mineral resource. The discharging of waste rock and tailings has large portion of mine land use and higher safety requirements. Simultaneously, it also brings great destruction to the mine area environment.

- **Waste rock**: – Waste rock is one of the maximum solid wastes occurred in the mining industry. In order to extract ore, large amount of rock is stripped or excavated and transported to the waste-rock dump.
- **Tailings**-: Tailings are the major solid wastes produced in the process of mineral beneficiation. In order to extract usable minerals, ore was crushed and milled to appropriate size, then, the usable minerals were separate from unusable minerals via different beneficiating methods

1.3. Reclamation of Solid Wastes

Utilization of waste rock for construction Waste rock results from stripping in an open-pit or excavation of an underground mine. Usually, according to the difference utilities of waste rock, it could be used directly or dressed to various sizes for using.

The following embodies utilization methods of waste rock:

A. A very good material for construction of roads. The coarser size waste rock can be used for Sub grade building and the fine size for road surface paving;
B. A very good material for construction of dams;
C. A very good material for beneficiating coarse and fine aggregate of concrete;
D. It could be used for making construction bricks when beneficiated to suitable size; and
E. To backfill the mined out area, subsidence area and other area needed to be filled.

- **Utilization of tailings for construction**

The usages of tailings as construction material are described as following:

A. Used for making wall bricks and floor tiles for construction;
B. Used for filling depressions, the mined out area or subsidence area;
C. Used for improving of the soil; and
D. Separating out coarser size for fine aggregate of concrete and building sand usage.

- **Recycling usable minerals**

With the development of mineral processing technology, it becomes possible that the usable minerals in tailings could be recycled.

- **Backfill mined out area**

Waste rock and tailings could also be used in the backfill mined area of a mine in transition from open-pit to underground mining. Backfill the mined area is not only

significant to the environmental restoring and improving the mining condition, but also a good idea of disposal method on solid waste from mines.

- **Regeneration of ground vegetation**

The investigation result shows that vegetation planted on the surface of iron tailings was not only propitious to tranquilizing and reducing soil erosion but also enhancing growth of vegetation.

- **Producing glass or fertilizer**

According to the varieties of mineral composition in tailings of different mine, tailings could be used to produce glass or fertilizer

Self-Check -2	Written Test

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

Say true if the statements is correct and say false if the statement is incorrect

1. Tailings are the major solid wastes produced in the process of mineral beneficiation. 2 point
2. With the development of mineral processing technology, it becomes possible that the usable minerals in tailings could be recycled. 2 point
3. When discarding your waste, find ways to recycle it instead of letting it go to landfill. 2 point
4. According to the varieties of mineral composition in tailings of different mine, tailings could be used to produce glass or fertilizer. 2 point
5. Residual wastes which cannot be used by any means should be disposed improperly. 2 point

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

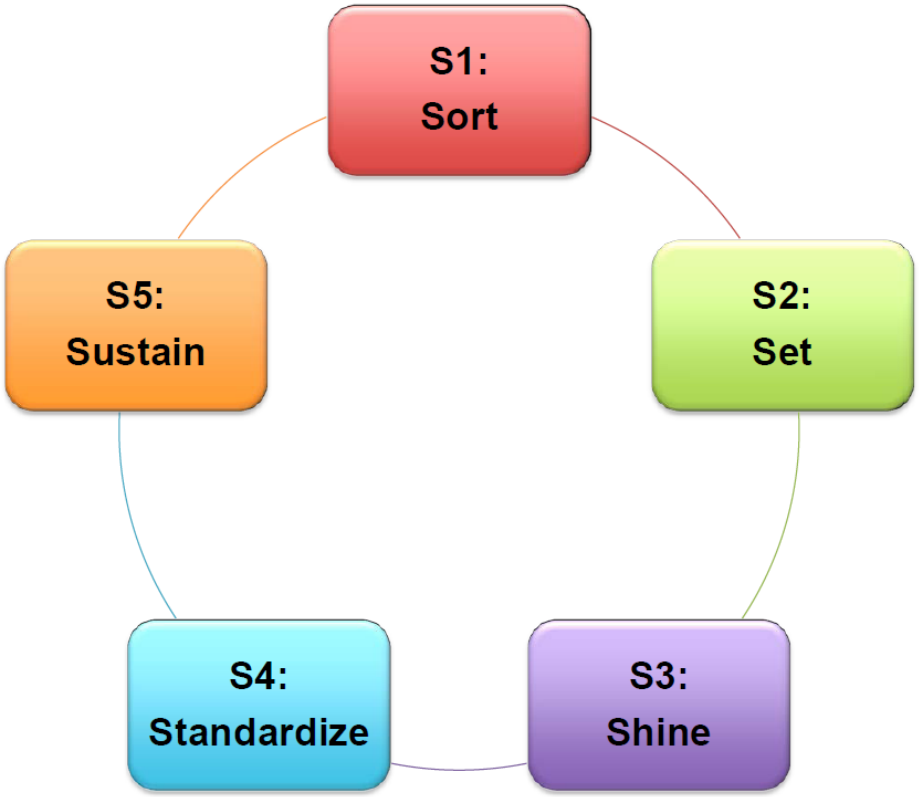
Information Sheet-2	Cleaning, checking and maintaining machinery, tools and equipment

2.1 Introduction

If you are mining worker, you'll be responsible for the condition of all the tools and equipment in the work site. This is a very important job. Inspect all tools as they are returned to determine if they need repairs or adjustment.

Wipe clean all returned tools and give their metal surfaces a light coat of oil. Check all precision tools upon issue and return to determine if they are accurate. Keep all spaces clean and free of dust to prevent foreign matter from getting into the working part of tools. Plan to spend a portion of each day reconditioning damaged tools. This keeps the tools available for issue and prevents an accumulation of damaged tools.

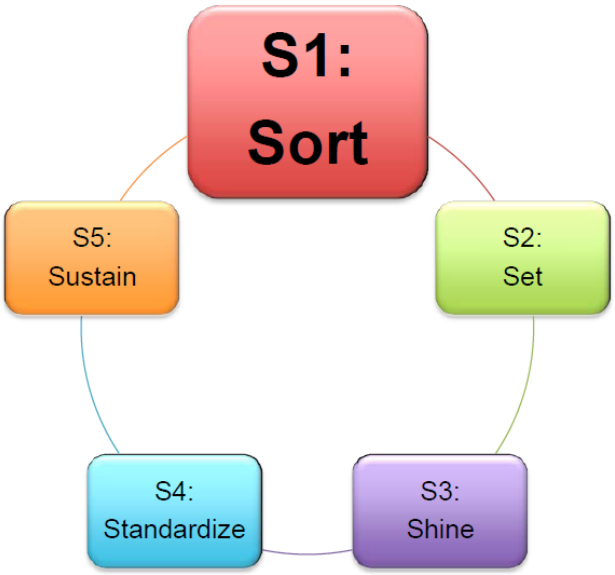
5S: Sort-Set-Shine-Standardize-Sustain




The 7 wastes
1
Overproduction
2
Inventory
3
Waiting
4
Motion
5
Transportation
6
Rework
7
Over processing

S1: Sort

- Focuses on eliminating unnecessary items from the workplace
- Categorize equipment, furniture, tool in your working place into the following 3 categories
  1. Necessary
  2. Unnecessary
  3. May not necessary
- This step will also help with the “just in case” attitude



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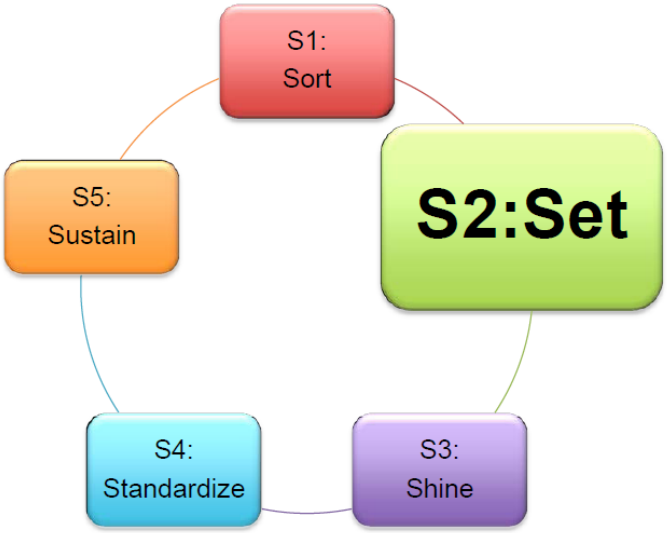
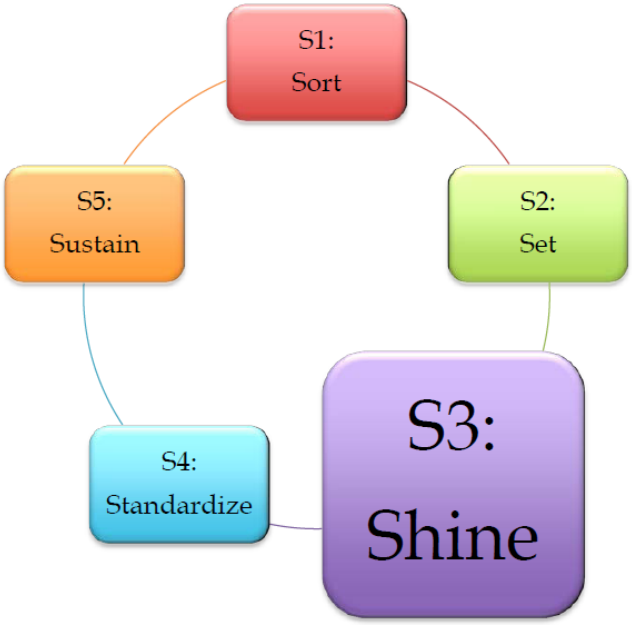
S2: Set

- "Set" is based on finding efficient and effective storage of necessary items
- Apply "Can see, Can take out, and Can return" philosophy
- This will save time and energy to look for something



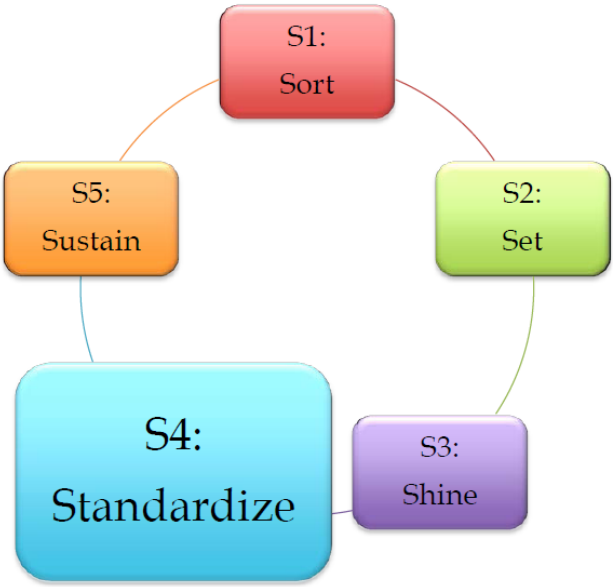
S3: Shine

- Cleaning up one's workplace daily so that there is no dust on floors, machines or equipment.
- It will create ownership and build pride in the workers



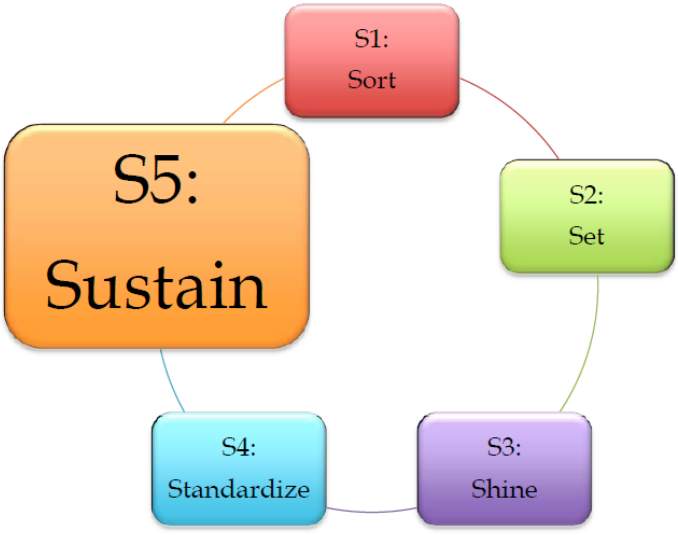
S4: Standardize

- Maintain an environment where S1 to S3 are implemented in the same manner throughout the organization
- Give opportunities to employees to take active part in the development of these standards.



S5 : Sustain

- Maintain S1-S4 through discipline, commitment and empowerment
- It focuses on defining a new mindset and a standard in workplace



Self-Check -2	Written Test

I. Define the following

1. *Sustain* _____
2. *Shine* _____
3. *Sort* _____

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

References:

1. Occupational Safety & Health Organization (OSHA). *Ergonomics eTool: Solutions for Electrical Contractors.* http://www.osha.gov. Web. 12 January 2012
2. Centers For Disease Control and Prevention (CDC). Ergonomic Guidelines for Manual Material Handling. http://www.cdc.gov. Web. 12 January 2012.

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