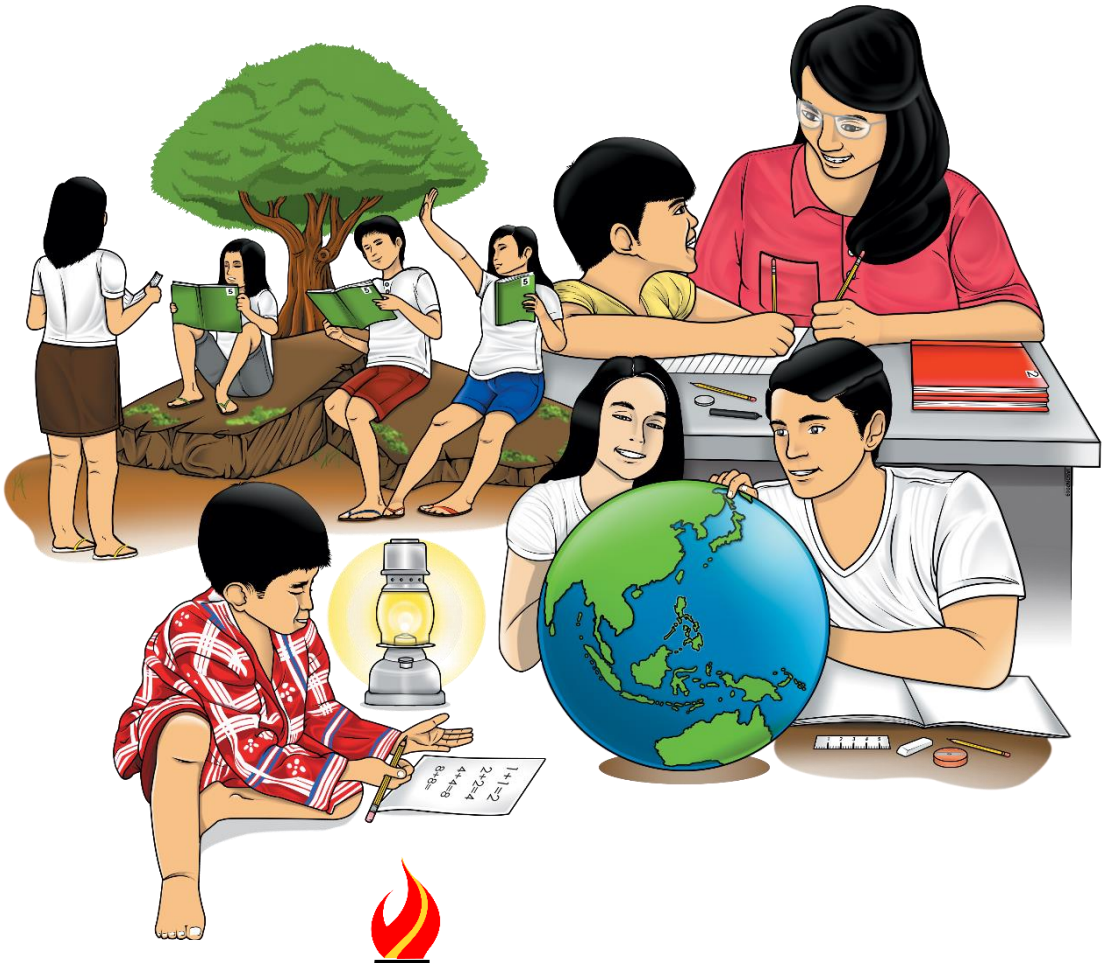
7/8

DepED
DEPARTMENT OF EDUCATION

TLE (SMAW)

Module 4:
MAINTAIN TOOLS AND EQUIPMENT (MT)



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TLE SMAW – Grade 7/8
Alternative Delivery Mode
Module 4: Maintain Tools and Equipment (MT)
First Edition, 2020

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by- step as you discover and understand the lesson prepared for you.

Pre-test are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module, or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teachers are also provided to the facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. Read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

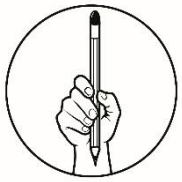
What I Need to Know

In this module, you will learn to demonstrate an understanding of concepts and underlying principles in the maintenance of SMAW tools and equipment. These will enable you to perform proper maintenance of SMAW tools and equipment based on industry standards.

Objectives:

At the end of this module, you should be able to:

1. Check condition of tools and equipment, *TLE_IAAW7 /8MT-0h-1*
2. Perform basic preventive maintenance, and *TLE_IAAW7/ 8MT-0i-2*
3. Store tools and equipment. *TLE_IAAW7/ 8MT-0i-*



What I Know

Pre-Test

Let us determine how much you already know about defective and non-defective SMAW tools.

Direction: Select the letter of the correct answer. Write your answers in your activity notebook.

1. **Defective** hand tools are kept and _____.
   A. marked as defective.
   B. mixed together with non-defective tools.
   C. put anywhere in the shop.
   D. sold in the junk shop.
2. One way of checking whether hand tools are **defective or non-defective** is the_____.
   1. length of service
   11. trademark of the manufacturer
   111. physical appearance

   A. 1 only
   B. 11 only
   C. 111 only
   D. 1, 11, and 111

3. Which is determined after the operation of a hand tool is tested?
   A. Service span
   B. Performance
   C. Physical appearance
   D. Repair Maintenance
4. **All hand tools** with major defects are subjected to _____.

   1. Repair
   11. Condemnation
   111. Display/sample
   A. 1 only
   B. 11 only
   C. 111 only
   D. 1, 11, and 111
5. **Service span** of a tool pertains to _____.
   A. maintenance schedule
   B. determining when the tool is acquired
   C. functionality of a tool
   D. defectiveness of a tool

6. When there is **something wrong** with either the tools or equipment, they need immediate repair and maintenance, this refers to _____.
   A. Performance
   B. Power supply
   C. Functionality
   D. Visual inspection
7. **Vibration or extra noise** from the operation means problems on parts and accessories started to develop, this refers to _____.
   A. Visual inspection
   B. Functionality
   C. Power supply
   D. Performance
8. **Failure to meet the required power supply**, malfunction will occur in the part of hand tools or equipment, but this will apply only to _____.
   A. Wooden tools
   B. Battery (DC) operated tools and equipment
   C. Electrical (AC) operated tools and equipment.
   D. Both B and C
9. An expert of the field when doing a visual inspection is more concerned on the _____ of the tools and equipment.
   A. Performance
   B. Functionality
   C. Power Supply
   D. Appearance

10. Tools that are **no longer functional** may cause _____when in used.
    A. Joy
    B. Efficiency
    C. Excellence
    D. Harm

B. TRUE OR FALSE: Read and analyze each statement below. Write **TRUE** if the statement is correct and **FALSE** if the statement is incorrect on the space provided.

_____ 1. Non-**functional tools and equipment** are those that are in good condition and can perform its regular functions.

_____ 2. **Functional tools and equipment** are those that are not able to perform its regular function because of impaired and damage part.

_____ 3. Visual inspection refers to the visual observation of an expert on the appearance of the tools and equipment.

_____ 4. Vibration or extra noise from the operation means problems on parts and accessories started to develop.

_____ 5. Failure to meet the required power supply, malfunction will occur in the part of hand tools or equipment.

Lesson 4 Maintain Tools and Equipment (MT)

Tools are very useful to us in our homes, especially to our job. It can help us make our work easy as it aids us to be more effective, and work faster. But tools that are no longer functional may cause harm.

What's In

There are many ways of identifying hand tools. One of these is to identify them according to their function. However, awareness of defective and non-defective hand tools is the earliest concern of workers/welders to be effective in their jobs.

Classifications of tools and equipment according to their use:

1. Measuring tools
2. Holding tools
3. Cutting tools
4. Driving tools
5. Boring tools
6. Electrical equipment
7. Miscellaneous tools/instrument/equipment

What's New

Functional tools and equipment - refer to the tools and equipment that are in good condition and can effectively complete its regular functions. This can be noticed first by its appearance as it is the most obvious thing to be seen. A functional tool and equipment can help you work faster and make your task much easier than usual.

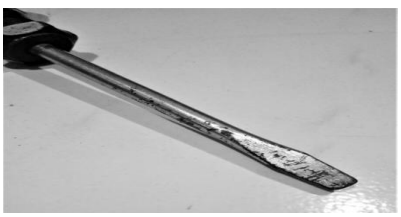
Given below are some examples of functional and non-defective tools and equipment:

Ball-peen hammer

Screwdriver

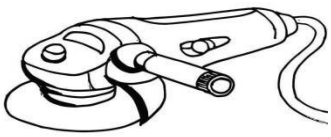
Combination pliers

Flat screwdriver head



Welding Machine

Grinder



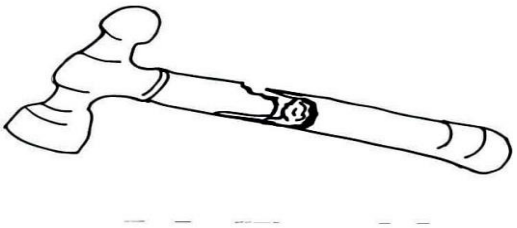
Bench Vise

Vise Grip

Non-functional tools and equipment - **refer to the tools and equipment** that are no longer capable of performing its regular function because of some damaged parts. A non-functional tool can also cause harm if it is still used in its current defective state. That is why it is important for us to label correctly a tool that is no longer functional and defective to avoid harm.

Given below are some examples of non-functional and defective tools and equipment.

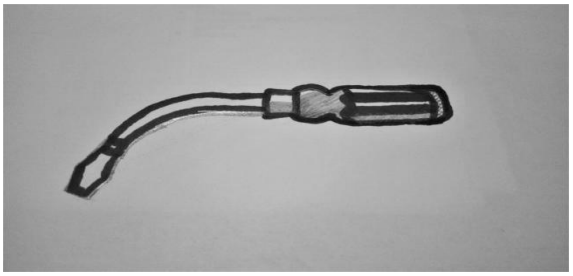
Broken Ball-peen hammer handle



Causes:

- Mishandling
- The material used (wood) for the handle is substandard
- Worn-out handle (due to the amount of time of it being used)

Bent Screwdriver



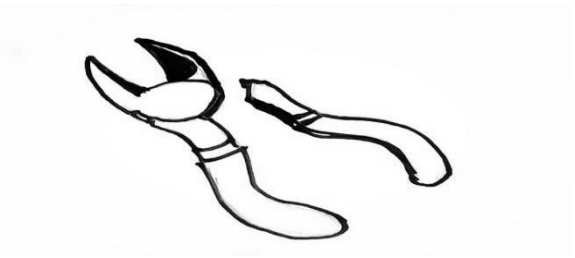
Causes:

- Mishandling

Substandard material was used in making the tool

Chipped Flat screwdriver head

Broken side cutting pliers handle



Causes:

- Mishandling
- Brittle metal material
- Accumulation of rust on the screwdriver head.
- Worn-out

Causes:
- Mishandling
- Substandard material was used in making the tool.
- Worn-out

Damaged welding cable

Causes:
- Mishandling
- Brittle cable
- Accidentally cut by a sharp object
- Worn out

Broken grinder blade

Causes:
- Mishandling
- Chipping on the brittle surface
- Worn out

MAINTAIN TOOLS AND EQUIPMENT

The primary purpose of inspection is to detect potential hazards so they can be corrected before an accident occurs. Inspection should be conducted in an organization to locate and report existing and potential unsafe conditions or activities. It is important that every potential hazard found in workplaces must be corrected to ensure that no one will be injured, or will be exposed to any diseases and that working environment will not be contaminated by hazardous chemicals emitted in the process.

2. Inspection Priorities

Who will conduct the inspection?

a. Safety professionals. They spearhead the inspection activity

b. Company or facility management. They demonstrate commitment to maintain a safe working environment.

c. First – line Supervisors or Foreman. Continually monitoring the workplace.

d. Employees. They inspect the workplace and any tools, equipment, and machinery that will be used. Any defects that the employee is not authorized to correct should be reported immediately to the supervisor.

e. Maintenance personnel. He is responsible for locating and correcting hazards.

f. Joint Safety and Health Committee. It conducts regular inspection as part of its functions.

Items to be inspected are as follows:

- Environmental factors
- Hazardous supplies and materials
- Production and related equipment's
- Power source equipment
- Electrical equipment
- Hand tools
- Personal Protective Equipment
- Personal service and first aid facilities
- Fire protection and emergency response equipment
- Walkways and roadways
- Elevators, electric stairways and man lifts
- Working surfaces
- Materials handling equipment
- Transport equipment
- Warning and signaling devices
- Containers
- Storage facilities and area both indoor and outdoor
- Structural openings
- Building and structures
- Miscellaneous

3. Schedule of Evaluation

Inspection can be classified as one of two types – continuous or interval inspection, which should be discussed using the key points such as the following:

a. Continuous Inspection
It involves noting an apparently or potentially hazardous condition or unsafe procedure that needs to be corrected immediately or reported at once to initiate corrective action. It is sometimes called informal inspection because it does not conform to a set of schedule, plan, or checklist.

b. Interval Inspection
Planned inspections at specific intervals are what most people regard as "real" safety and health inspections. They are deliberate and follow a systematic procedure that permits examination of specific items or conditions. Their interval inspections may be periodic, intermittent, or general.

4. Conducting Inspection

In conducting an inspection, some of the general considerations are the following; - Must not interrupt normal operations - Review all accidents and previous Inspection Report made. - Awareness of any potential hazards - Wearing of Personal Protective Equipment - Formulation of checklist.

5. Reporting and Recording

Checklists serve as reminders of what to look for and as records of what have been covered. They can be used to structure and guide inspection. They also allow on-the-spot recording of all findings and comments before they are forgotten. In case an inspection is interrupted, checklists provide a record of what has and what has not been inspected. Otherwise, an inspection may miss items or conditions that should be examined. Good checklists also help in follow-up work to make sure hazards have been corrected or eliminated.

The format of a checklist should include columns to indicate either compliance or date of taken action. Space should also be provided to cite the specific violation, a way to correct it, and a recommendation that the condition receives more or less frequent attention. Whatever the format of the checklist, space should be provided for the inspector's signature and the inspection date.

Inspection Report – Every inspection must be documented in a clearly written inspection report to furnished the inspector. Without a complete and accurate report, the inspection would be a little more than an interesting sightseeing tour. Inspection reports are usually of three types:

a. Emergency – made without delay when a critical or catastrophic hazard is probable.

b. Periodic – covers those unsatisfactory non-emergency conditions observed during the planned periodic inspection. This report should be made within 24 hours of the inspection.

c. Summary – lists of all items of previous periodic reports for a given time.

Generally, inspection reports are sent to the head of the department or area where the inspection was made. Copies are also given to executive management and the manager to whom the department head reports.

5. Implementation

Upon implementation of the inspection report, make sure that recommendations proposed by the inspector will be given priority depending on the hazards found in the area. In making recommendations, inspectors should be guided by four (4) rules:

a. Correct the cause whenever possible. If all the resources needed to correct the cause are already available, improve the working condition.

b. Immediately correct everything possible. All possible causes of accidents should be corrected at once to prevent their recurrence. This will definitely be done if all measures are in place.

c. Report conditions beyond one's authority and suggest solutions. Safety is everybody's job. Anyone should be involved in the prevention of accidents. If you identify hazards in your place or work, report them at once to your supervisor. Give some recommendation to correct the situation.

d. Take intermediate action as needed. Time is an essence as far as safety is concern. If an unsafe condition is identified and corrective measure is at hand, improve it at once.

6. Monitoring

Monitoring is a management prerogative. Management must realize that employees are keenly interested in the attention paid to correcting faulty conditions and hazardous procedures. Recommendations approved and supported by management should become part of the organization's philosophy and program. At regular intervals, supervisors should report progress in complying with the recommendations to the safety department, the company safety and health committee, or the person designated by management to receive such information. Inspectors should periodically check to see what progress toward corrective actions is being made. Unsafe conditions left uncorrected indicate a breakdown in management communications and program applications.

Sometimes management will have to decide among the several courses of action. Often these decisions will be based on cost effectiveness. For example, it may be cost-effective as well as practical to substitute a less toxic material that works as well to the highly toxic substance presently in use. On the other hand, replacing a costly but hazardous machine may have to wait until funds can be allocated. In this case, the immediate alternative taken or proposed must be communicated to all persons involved.

7. Routine Maintenance

Maintenance of hand tools and machines are both primordial concerns of a repair technician in the welding shops and/or in the welding production. The activities should be on schedule and with proper coordination with the production people. The term "repair" and "maintenance" works mean differently. Repair, unusually focuses on the program of works done in the operation of power plants in machines that are in trouble of stopping its function. While the term "maintenance" means a scheduled or a planned visit of tools or equipment for inspection and from there, reports and recommendation developed and the next tasks to be decided such as cleaning, application of lubricants, dismantling and etc.

Some of the simple maintenance activities for hand tools, and the maintenance schedule should be posted in a visible corner of the shop where everybody can read it.

a. Lubricating. A task performed in the shop/production. Through the application of lubricant substance to the identified items in parts like barrels, rollers, springs, bearing, bolts and nuts, and other automotive parts.

b. Tightening/Loosening. In an assembly of structures, we have tools for fittings that need to be tightened and loosened and in as much as they pose high risk to safety. Tightening bolts and nuts and other fittings requires procedures that should carry out in compliance.

c. Tool for hand Sharpening. Some tools need to be sharpened such as blades of knife, cold chisel, punches and many others. To do hand sharpening for hand tools requires techniques and application. In some multi knives and cutter, manufacturers produce knife sharpening system to hold or clamp the blade to ensure a strong blade to stone contact during sharpening and also provided with a course to fine honing stones. For cold chisel and punches, the right file-size and grades are used for repairing the defective anvil curve.

d. Simple Repair. Repair practices of hand tools are still available anytime. But, to some extent, tools are checked yearly and many of the hand tools are eligible for condemnation and the whole items are to be replaced by a new unit. However, there are instances that minor repairs can be performed, like replacement of a wooden handle of a hammer and a mushroomed head of a cold chisel.

e. Cleaning. Simple process applied to hand tools. The cleaning approach may differ from one another. For example, cleaning the rack corners of hand tools by using an air vacuum or by a piece of clothes. Similar process may be applied to identical cleaning situations

8. Proper Storage of Hand Tools and Equipment

5S Implementation

a. **Sort** - Eliminate whatever is not needed by separating needed tools, parts, and instructions from unneeded materials.
b. **Set in order** - Organize whatever remains by neatly arranging and identifying parts and tools for ease of use.
c. **Shine** - Clean the work area by conducting a cleanup campaign.
d. **Standardize** - Schedule regular cleaning and maintenance by conducting sorting, set in order, and shine daily.
e. **Sustain** - Make 5S a way of life by forming the habit of always following the first four S's.

What is It

Methods of identifying non-functional tools and equipment

1. Visual inspection. It refers to the visual observation of an expert on the appearance of the tools and equipment.

2. Functionality. Vibration or extra noise from the operation means problems on parts and accessories started to develop.

3. Performance. When there is something wrong with the performance of either hand tools or equipment, they need immediate repair or maintenance.

4. Power supply (for electrically operated only). Failure to meet the required power supply, some malfunction will occur in the part of hand tools or equipment.

5. Persons involved. It refers to the technical person who has the knowledge and skills about technology.

Tools that are no longer functional may cause harm. So make sure to:

A. Make an inventory of functional and non-functional tools in your shop.
B. Classify your tools according to is function

Guide Questions:

Answer the following questions and write your answer in your activity notebook.

1. How can you recognize a functional tool and equipment?

   _____
   _____
   _____
   _____

2. How can you recognize a non-functional tool and equipment?

   _____

3. What is the best way to avoid damaging tools and equipment

   _____
   _____
   _____
   _____

What's More

Activity 1.

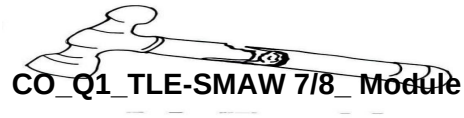
A. Identify the following tools whether it is **functional** or **non-functional.** Explain why?

1. 

2. 

3. 

4. 

5. 

B. Answer the following question concisely.

1. What will happen if you continue to use non-functional and defective tools and equipment?

_____
_____
_____

What I Have Learned

Activity 2

You are about to complete this module; I am sure you can answer the following questions:

1. How are you going to classify functional and non-functional tools and equipment?

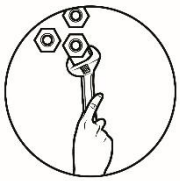
_____
_____
_____

2. What will you do if the tools are no longer functional?

_____
_____
_____

3. What method of identifying non-functional tools and equipment do you find the easiest?

_____
_____
_____



What I Can Do

Activity 3

Now that you have learned how to check functional and nonfunctional tools and equipment. You are now tasked to do the following:

1. Find any tools at home and determine whether it is functional or not. Explain why?

_____
_____
_____
_____

2. Explain the step by step procedure of keeping/storing the welding machine after it is being used.

_____
_____
_____
_____
_____

3. What is the importance of observing proper maintenance of SMAW tools and equipment?

_____
_____
_____
_____
_____

Assessment

Post-Test

Let us determine how much you already know about determining functional and non-functional tools and equipment.

Direction: Select the letter of the correct answer. Write your answers in your activity notebook.

1. **Defective** hand tools are kept and _____.
   A. marked as defective.
   B. mixed together with non-defective tools.
   C. put anywhere in the shop.
   D. sold in the junk shop.

4. One way of checking whether hand tools are **defective or non-defective** is the_____.
   1. length of service
   11. trademark of the manufacturer
   111. physical appearance

   A. 1 only
   B. 11 only
   C. 111 only
   D. 1, 11, and 111

5. Which is determined after the operation of a hand tool is tested?
   A. Service span
   B. Performance
   C. Physical appearance
   D. Repair Maintenance

6. **All defective hand tools** with major defects are subjected to _____.
   1. Repair
   11. Condemnation
   111. Display/sample
   A. 1 only
   B. 11 only
   C. 111 only
   D. 1, 11, and 111

7. **Service span** of a tool pertains to _____.
   A. maintenance schedule
   B. determining when the tool is acquired
   C. functionality of a tool
   D. defectiveness of a tool

8. When there is **something wrong** with either the tools or equipment, they need immediate repair and maintenance, this refers to _____.
   A. Performance
   B. Power supply
   C. Functionality
   D. Visual inspection

9. **Vibration or extra noise** from the operation means problems on parts and accessories started to develop, this refers to _____.
   A. Visual inspection
   B. Functionality
   C. Power supply
   D. Performance

10. **Failure to meet the required power supply**, will cause malfunction in the part of hand tools or equipment, but this will apply only to _____.
    A. Wooden tools
    B. Battery (DC) operated tools and equipment
    C. Electrical (AC) operated tools and equipment.
    D. Both B and C

11. An expert of the field when doing a visual inspection is more concerned on the _____ of the tools and equipment.
    A. Performance
    B. Functionality
    C. Power Supply
    D. Appearance

12. Tools that are **no longer functional** may cause _____
    A. Joy
    B. Efficiency
    C. Excellence
    D. Harm

B. TRUE OR FALSE: Read and analyze each statement below. Write **TRUE** if the statement is correct and **FALSE** if the statement is incorrect. Write your answer on the space provided.

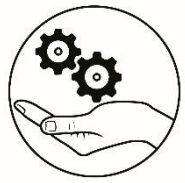
_____ 1. Non-**functional tools and equipment** are those that are in good condition and can perform its regular functions.

_____ 2. **Functional tools and equipment** are those that are not able to perform its regular function because of impaired and damage part.

_____ 3. Visual inspection refers to the visual observation of an expert on the appearance of the tools and equipment.

_____ 4. Vibration or extra noise from the operation means problems on parts and accessories started to develop.

_____ 5. Failure to meet the required power supply, will cause malfunction in the part of hand tools or equipment.



Additional Activities

Activity No. 4: Proper Storage and Maintenance of Tools and Equipment

Instruction:

1. Gather all tools available (SMAW or any tools) in your home.
2. Clean the tools and equipment properly.
3. Place the tools and equipment in a storage place, and arrange them properly.

Reflection: _____

Answer Key

Post test

A.

1. A	6. A
2. C	7. B
3. C	8. C
4. B	9. D
5. B	10. D

B.

1. FALSE
2. FALSE
3. TRUE
4. TRUE
5. TRUE

Activity 1

A.

1. non-functional
2. functional
3. non-functional
4. functional
5. non-functional

Pretest

A.

1. A	6. A
2. C	7. B
3. C	8. C
4. B	9. D
5. B	10. D

B.

1. FALSE
2. FALSE
3. TRUE
4. TRUE
5. TRUE

ACTIVITY 4

BROKEN	PERFORMANCE
DEFECTIVE	INSPECTION
FUNCTION	

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