7/8

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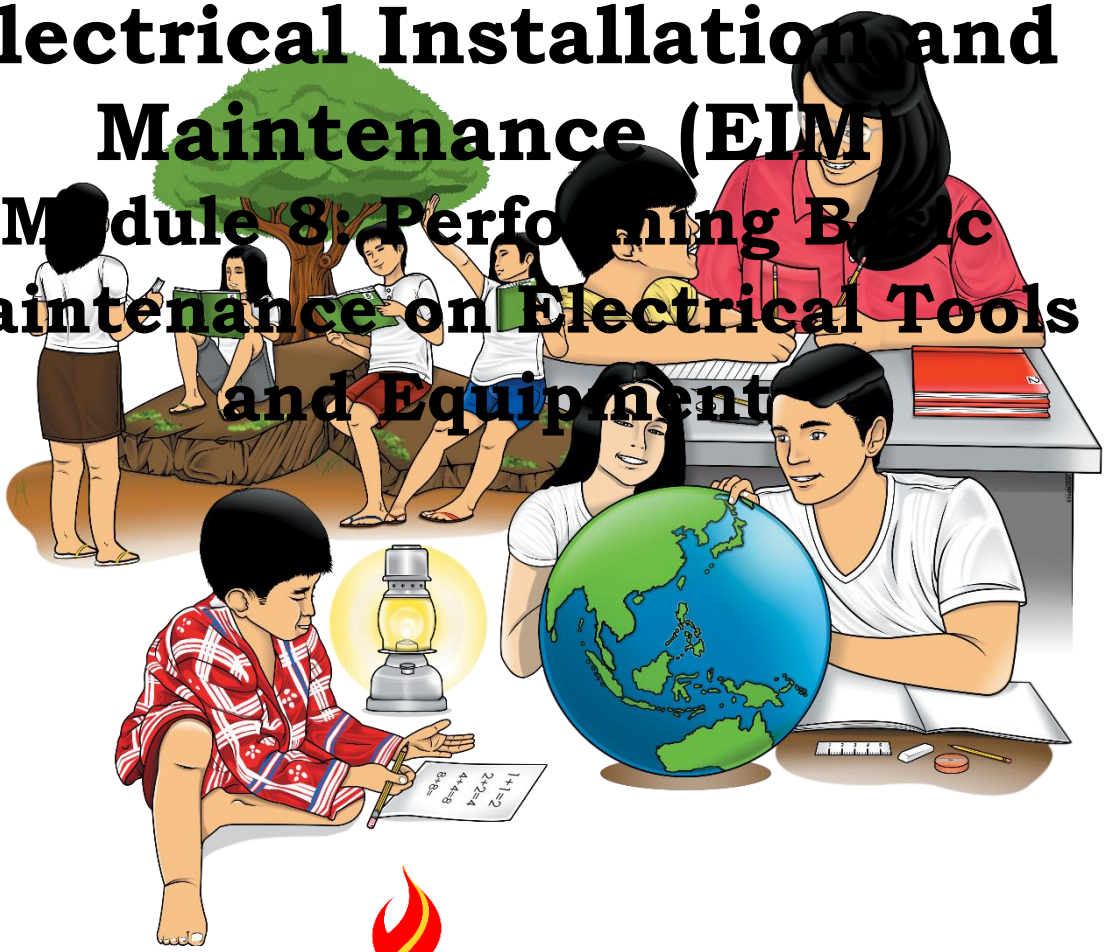
DEPARTMENT OF EDUCATION

Technology and Livelihood Education

Exploratory Course

Electrical Installation and Maintenance (EIM)

Module 8: Performing Basic Maintenance on Electrical Tools and Equipment



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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-tests 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 Teacher are also provided to our 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. And 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

Hep, hep, Hooray! Welcome to another exciting lesson that you are about to learn. This time you will be filled with new concepts, ideas, and understandings.

This module contains lessons about lubricating tools and equipment, its importance, and the result of what's going to happen to it whenever you don't use lubrication to these tools and equipment. This lesson is intended to answer your curiosity.

At the end of this lesson, you are expected to conduct preventive maintenance activities on tools and equipment needed in an electrical job.

After going through this module, you are expected to:

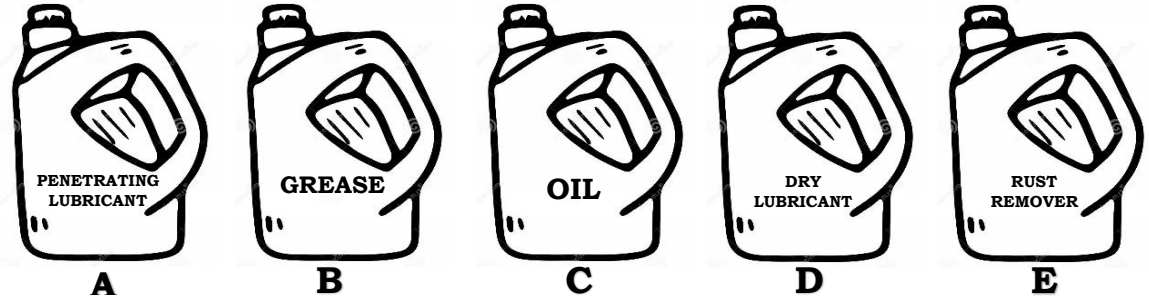
1. clean and lubricate tools and equipment; and
2. observe periodic preventive and maintenance of electrical tools and equipment such as: sharpening, oiling, and insulating.
   (TLE_IAEI 7/8MT-0f-2)

What I Know

You are in! Before you uncover this topic, first, test yourself with your prior knowledge about the lesson you are about to learn. Take time to enjoy the following activities, write you answer in your activity sheet.

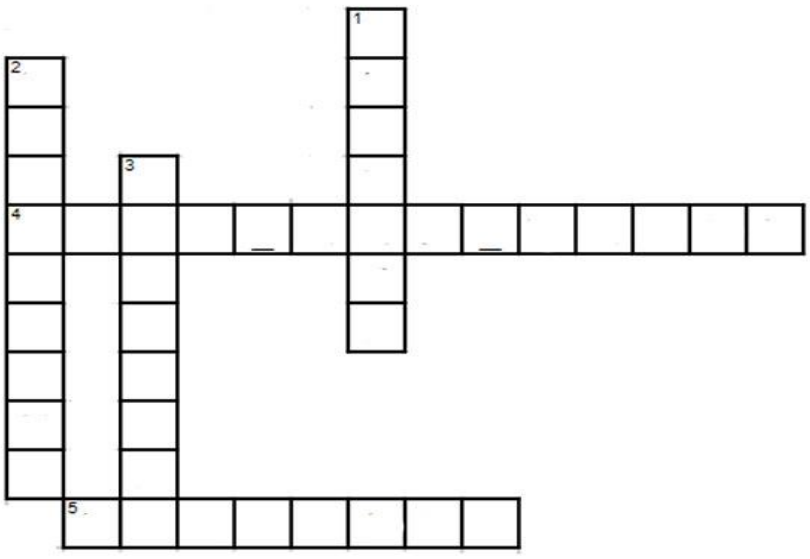
ACTIVITY 1. Use it!

A. Direction: Identify the word/s that best describe the statement. Choose your answer from the illustrations below and write the letter of your answer in your activity sheet.



_____1. It is used in lubricating the gears, clean and protect electrical tools and equipment.
_____2. It is used for stock-up parts like bearing, bushing and heavy bolts and nuts.
_____3. It is used to dissolve rust.
_____4. It is used for bearings, gaskets and other moving parts.
_____5. It is used for rubber, car door gaskets and window sashes.

B. Direction: Fill in the crossword puzzle box with correct words described in the phrases given.



Down

1. used to remove spilled paint on the floor, walls and tools
2. used to wash oil engine, transmission
3. used to wash oil/greasy tools/ equipment

Across

4. used to wash/clean upholstered furniture such as seats, tables, cabinets
5. used to remove dust, grease oil, paint

Lesson 1 Performing Basic Maintenance on Electrical Tools and Equipment

What's In

Are you ready? You are about to be immersed in this module. I am happy that you are interested to move forward. Welcome to another exciting lesson about lubricating tools and equipment.

This module will guide you on the importance of lubricating tools and equipment as part of your learning adventure in minor repair of defective tools and conducting preventive maintenance of electrical tools.

Notes to the Teacher

When teaching this lesson, the teacher must emphasize to the learners the value of preventive maintenance to ensure the functionality and maximize the usefulness of these tools and equipment. In actual practice, they might be touching and engaging with materials that will cause skin irritation. Remind your learners to be cautious always. Remind them to use the right tool for the right job.

What's New

Activity 2. Reflect Me!

Direction: Let us start your discovery by identifying the following words below with the use of a mirror. This will guide you of the words and terms you may encounter in your learning soon. Write your answer on your activity notebook.

1. RUSTY REMOVER
2. ELECTRICAL
3. PENETRATING LUBRICANT
4. ORGANIZE
5. INSPECTION
6. EQUIPMENT
7. OIL
8. TOOLS
9. GASOLINE
10. SEIKETSU
11. PREVENTIVE MAINTENANCE
12. LUBRICANT
13. STANDARDIZED
14. GREASES
15. SOLVENT

Did you get the right answer? Good job! Now, proceed to more learning journey ahead!

What is It

Great! You will enjoy acquiring new learnings by understanding different terms and materials you may have heard of or use in your daily activities. Let's find out!

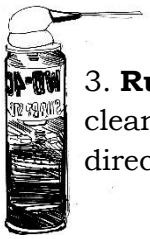
LUBRICANTS

A lubricant is a commonly used substance to reduce friction between moving surfaces. It coats surfaces and resists being displaced by pressure, keeping the metal parts separated. It also prevents corrosion, block contaminants and can serve as a coolant.

Types of lubricants

1. **Oils-** commonly used in lubricating the gears, clean and protect electrical tools and equipment. Oils come in different "weights" (such as 5W or 10W), which correspond to viscosity. The lower the number, the thinner the oil and flows easily.

2. **Greases**- used for lubricating bearings, gaskets, seals and other moving parts. Greases can even act as a barrier, protecting the surfaces from contaminants that can corrosion or damage them.



3. **Rust remover-** used mainly to dissolve rust, but it makes an excellent cleaner as well. For example, to remove a rusted bolt, spray remover directly on the bolt, wait for approximately five minutes and unscrew.

4. **Dry lubricant-** a greasy lubricant but when applied, dries in a few minutes and leaves a protective film. Since it dries rapidly, it doesn't attract dust, so there is no mess. It is commonly used on rubber, car door gaskets, handsaws, miter saw, saw sliders, window sashes, etc.

5. **Penetrating lubricant**- the saviors of many stuck-bolt combatants, loosening years of rust and debris in minutes. It is also useful for door hinges, even the fridge, hard to open pliers, ski bindings, etc., as it does not hold dirt and dust.

SOLVENTS

Solvent is a substance that dissolves solute in greater proportion or amount. It can be classified as polar or nonpolar. Polar solvents are solvents which dissolve/are soluble in water; while nonpolar solvents are solvents which do not dissolve/are insoluble in water.

Kinds of Cleaning Solvent Based on Their Solubility in Water

Cleaning Solvents	Solubility in Water	Polar	Non polar
a. Water	soluble	✓	
b. gasoline	insoluble		✓
c. kerosene	insoluble		✓
d. thinner	insoluble		✓
e. detergent soap	soluble	✓	

Uses of Cleaning Solvents

Cleaning Solvents		Uses
1. soap and water	-	used to wash or clean upholstered furniture such as seats, tables, cabinets.
2. kerosene	-	used to remove dust, grease oil, paint.
3. diesoline	-	used to wash oil engine, transmission and other parts of the vehicle.
4. Gasoline	-	used to wash oil, greasy tools and equipment.
5. thinner	-	used to remove spilled paint on the floor, walls and tools.

Preventive Maintenance of Electrical Tools and Equipment

Preventive maintenance is a regular and a periodic inspection of tools and equipment. It is usually indicated in the user's manual. This is aimed to avoid unexpected breakdown or failure to function in a normal task. Technological advances and diagnosis make preventive maintenance more reliable.

PREVENTIVE MAINTENANCE TASKS

Check the following task:

1. Clean the interior and exterior of tools and equipment cabinet, using a vacuum cleaner or clean cloth.
2. Cover with tape, solder or replace any defective wiring or hooded connectors.
3. Tighten loose parts of equipment.
4. Test the power supply for proper voltages.
5. Inspect tools for sharpness.
6. Apply oil/grease on moving parts of tools and equipment.
7. Check for and replace worn or damaged tools.
8. Perform all preventive maintenance procedure according to user's manual.

I know you have enjoyed the lessons presented/ This time, let's discuss the 5S approach on how to organize and manage the workplace and work flow. Let's check the 5S's.

1. **SEIRI:** SORT - to identify and eliminate all unnecessary items from your work place and dispose them.
2. **SEITON**: SET IN ORDER - to organize, arrange and identify everything in a work area for the most efficient and effective retrieval and return to its proper place.
3. **SEISOO**: SWEEP - to clean your workplace thoroughly so that there is no dust on floor, on machines and on equipment.
4. **SEIKETSU:** STANDARDIZE – to maintain high standard of cleaning and workshop organization.
5. **SHITSUKE**: SUSTAIN- to train people to follow cleaning disciplines independently.

What's More

Since you are done in learning the lesson on preventive maintenance of electrical tools, I believe that you are definitely ready for more fun. Proceed below and you will discover something new.

Activity 3. Maintaining is Winning!

A. Direction: True or False: Write T if the statement is True and F if the statement is False. Write your answer on your activity sheet.

_____ 1. Clean the interior and exterior of tools and equipment cabinet, using a soap and water.
_____ 2. Measure the output voltage of power supply for proper voltages.
_____ 3. Always check the wires and cable for opened wire and cuts, and cover with electrical tape.
_____ 4. Apply oil/grease on moving parts of tools and equipment.
_____ 5. Tighten loose parts of equipment.

B. Direction: Identify the cleaning solvent to be used and classify whether it's Polar or Nonpolar. Write your answer on your activity sheet.

Uses	Cleaning solvent	Polar/Non-Polar
1. It is used to wash out spilled paint on the floors and walls as well as on the tools/ equipment.	1.	6.
2. It is used to clean oil engine, transmission and other parts of the vehicle.	2.	7.
3. It is used to clean upholstery and other furniture.	3.	8.
4. It is used to wash oil, greasy tools and equipment.	4.	9.
5. It is used to remove dust, grease and oil.	5.	10.

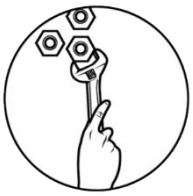
What I Have Learned

Activity 4. At Home!

Direction: Collect all your defective tools and equipment at home, Identify the defect/s and the preventive maintenance of your electrical tools and equipment. Choose what is suitable for you to comply this activity:

Option 1: Take pictures and paste it in the table below.
Option 2: Take pictures with caption/s and send it to your teacher through messenger.
Option 3: Draw the tools and equipment on your activity notebook.

TOOLS	DEFECT/S	PREVENTIVE MAINTENANCE



What I Can Do

Activity 5. Who You?

Direction: Identify the lubricants needed in order to maintain the following materials. Write your answer in your activity sheet.

No.	Materials/Tools/Equipment	Lubricant needed
1	rusted bicycle chain	
2	hammer	
3	hydraulic floor jack	
4	door hinges	
5	rusted bolt	
6	bearings	
7	screwdriver	
8	hard to open pliers	
9	gears	
10	pullers	
11	air chisel	
12	car door gaskets	
13	rubber	
14	electrician knife	
15	portable electric drill	

Assessment

Activity 6. Check the Tools!

Direction: Choose the best answer from the choices given. Write your answer in your activity sheet.

1. Which of these is an action to clean the workplace thoroughly so that there is no dust on the floor, machines, and equipment?
   A. sort B. sweep C. sanitizes D. sustain

2. Which is a condition of training people to follow cleaning disciplines independently?
   A. sort B. sweep C. sanitizes D. sustain

3. Which of these is done to identify and eliminate all unnecessary items from your workplace and dispose them?
   A. sort B. sweep C. sanitize D. sustain

4. Which of these is an action to arrange or put every necessary item in good order so that s they can be easily picked for use?
   A. sweep B. set in order C. sanitize D. sort

5. Which is a condition of maintaining high standard of cleaning and workshop organization?
   A. sweep B. systematize C. standardize D. sort

6. Which is the process that prevents corrosion, and reduces friction?
   A. painting B. sharpens C. sanding D. lubricating
7. Which is used to wash oil/greasy tools and equipment?
   A. kerosene B. gasoline C. mineral D. water

8. Which is used to wash oil engine, transmission and other parts of vehicle?
   A. diesoline B. oil C. mineral D. vegetable oil

9. Which is used to remove dust, grease, oil, paint?
   A. soap B. water C. kerosene D. grease
10. Which is used to remove spilled paint on the floor, walls and tools?
   A. Thinner B. Mineral C. Water D. Vegetable

11. Which is used to lubricate bearings, gaskets, seals, and other moving parts?
   A. rust remover B. dry lubricant C. penetrating lubricant D. greases

12. Which is used mainly to dissolve rust, and it also makes an excellent cleaner?
   A. rust remover B. dry lubricant C. penetrating lubricant D. oil

13. Which among these lubricants is used on rubber, car door gaskets, handsaws, miter saw, saw sliders, window sashes?
   A. rust remover B. dry lubricant C. penetrating lubricant D. oil

14. Which of these has the primary goal to prevent the failure of equipment before it occurs?
A. preventive maintenance B. lubricating C. sharpening D. painting

15. Which of the following is not a non-polar solvent?
A. water B. gasoline C. kerosene D. thinner

Additional Activities

To end this lesson, let's have a practical activity to apply what you have learned about how to repair defective tools/equipment and conduct preventive maintenance on electrical tools and equipment from a real electrician.

Activity 6. Hello THERE!

Direction: Interview an electrician and ask his routine on how he does maintain and clean his electrical tools. Write your answer in your activity sheet.

Guide Questions:	**Electrician's answer**
Good morning Mr./Ms._____. I am (your name). 1. How long have you been as an electrician? 2. What are the things to remember in conducting preventive maintenance of electrical tools and equipment? Thank you, Sir/Ma'am, _____. You really made me well informed with this conversation. Have a good day!	

Answer Key

Activity 1. Used It!

A.
1. C
2. A
3. E
4. B
5. D

B.
1. thinner
2. diesoline
3. gasoline
4. soap and water
5. kerosene

Activity 2. Reflect Me!

1. Rust remover
2. Electrical
3. Penetrating lubricant
4. Organize
5. Inspection
6. Equipment
7. OIL
8. Tools
9. Gasoline
10. Seiketsu
11. Preventive maintenance
12. Lubricant
13. Standardize
14. Greases

Activity 3. Maintaining is Winning!

A.

1. F	1. thinner
2. T	2. diesoline
3. T	3. soap and water
4. T	4. gasoline
5. T	5. kerosene

B.
6. non polar
7. non polar
8. polar
9. non polar
10. non polar

Activity 4. At Home!

Present your finished activity to your teacher next time you meet.

Activity 5. Who You?

1. rust remover
2. oil
3. greases
4. penetrating lubricant
5. rust remover
6. greases
7. oil
8. penetrating lubricant
9. grease
10. oil
11. oil
12. dry lubricant
13. dry lubricant
14. oil
15. oil

Activity 6. Check the Tools!

1. b
2. d
3. a
4. b
5. c
6. d
7. b
8. a
9. c
10. a
11. d
12. a
13. b
14. a
15. a

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