

Department of Education
SPTVE
Exploratory 7
Electrical Installation and Maintenance
Prepare Electrical Materials and
Tools for the Task
Quarter 2: Week 1 Module



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Expectation

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

1. identify the tools and materials as per job requirement;
2. classify the tools and materials according to its function as per job requirements; and
3. recognize properly the electrical tools and materials that can be found or used at home.



Pre-Test

Directions: Read the questions carefully and choose the correct answer. Encircle the letter of the correct answer.

1. It comes in either Standard or Philips screw driver with short shank or blade and shorted handle used to turn screws in tight spaces.
A. linemen's plier
B. long nose pliers
C. philips screw driver
D. stubby screw driver
2. This has a cross tip resembling a positive (+) sign.
A. linemen's plier
B. long nose pliers
C. philips screw driver
D. stubby screw driver
3. A device inserted to a convenience outlet to conduct electric current.
A. conduits
B. connectors
C. hammer
D. male Plug
4. It is an electrical materials used to passage wires for protection and insulation.
A. conduits
B. connectors
C. hammer
D. male Plug
5. A tool used for cutting and holding fine wires. It can reach tight space or small opening where other pliers cannot reach.
A. Linemen's plier
B. Long nose pliers
C. Philips screw driver
D. Side-cutter plier
6. This protective device is used to automatically cut off the current when trouble in the circuit such as short circuit or over load occurs.
A. connectors
B. circuit breaker
C. junction box
D. utility box

7. It is used by linemen in doing heavy tasks to grip, hold, and cut electrical wires and cables.

A. linemen's plier	C. philips screw driver
B. long nose pliers	D. side-cutter plier

8. This tool is used in driving or pounding and pulling out nails.

A. conduits	C. hammer
B. connectors	D. male Plug

9. This is a rectangular shaped metallic or plastic (PVC) material in which flush type convenience outlet and switch are attached.

A. connectors	C. junction box
B. circuit breaker	D. utility box

10. It is an octagonal-shaped electrical material where the connections or joints of wires are being done.

A. connectors	C. junction box
B. circuit breaker	D. utility box



Brief Introduction

Working with electricity can be accomplished thoroughly by following the procedure or its step by step process as it will save your time, effort and resources. While most of the work cannot be done by bare hands, completing the task with the aid of electrical tools and equipment is necessary.

The content of this module will help you identify the most common tools, materials and equipment used to perform and accomplish common electrical jobs.



Activities

The following are common electrical tools and equipment needed in the installation of electrical wiring, and they can be classified according to their functions such as Driving tools, holding tools, cutting tools and Boring tools.

I. SCREWDRIVERS. These tools are made of hardened steel and tempered tip used to loosen or tighten screws with slotted heads. They come in various sizes and shapes.



a. Standard or Flat Screw Driver. The blade-tip is wedge-shapes and resembles a negative (-) sign. This is used to drive screws with a single slot head.

b. Philips Screw Driver. This has a cross tip resembling a positive (+) sign. This is used to drive screws with cross slot heads.

c. Stubby Screw Driver. It comes in either Standard or Philips screw driver with a short handle or blade and a shortened handle used to turn screws in tight spaces where standard screw drivers cannot be used.

d. Allen Screw Driver/Allen wrench. This could be in the shape of a screw driver or a wrench. Its function is to drive screw with hexagonal slot head.

II. HAMMERS. These tools are used in driving or pounding and pulling out nails. They are made of hard steel, wood, plastic or rubber.



a. Claw hammer - a hammer with one side of the head split and curved, used for extracting nails.

b. Mallet (rubber head) - a kind of **hammer**, often made of rubber or sometimes wood, that is smaller than a maul or beetle, and usually has a relatively large head.

c. Ballpeen Hammer -a hammer with a rounded end opposite the face, a type of **peening** hammer used in **metalworking**.

III. PLIERS. These are made from metal with insulated handle. Pliers are used for cutting, twisting, bending, holding and gripping wires and cables.



a. Combination Pliers (Lineman's Pliers). This is used to gripping, holding, and cutting electrical wires and cables and even small nails. They are usually used by linemen in doing heavy tasks.

b. Side Cutting Pliers. This type of pliers is used for cutting fine, medium and big wires and cables.



c. Long Nose Pliers. This is used for cutting and holding fine wires. This can reach tight spaces or small openings where other pliers cannot reach. This plier can also be used in making terminal loops of copper wires.

IV. WIRE STRIPPER. A tool used for removing insulation of medium-sized wires ranging from gauge #10 to gauge #16.



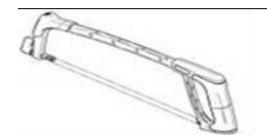
V. ELECTRICIAN'S KNIFE. This is used by linemen to remove insulation of wire and cables in low and high voltage transmission lines.



VI. PORTABLE ELECTRIC DRILL. A small drilling machine with a chuck capacity of 1/4" to 3/8". It is used in making holes on metal sheets and concrete walls.



VII. HACKSAW. This tool is used to cut metal conduit and armored cable.












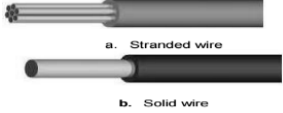
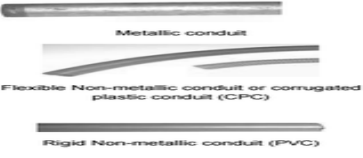
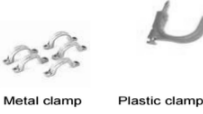

ELECTRICAL SUPPLIES AND MATERIALS

Electrical materials are developed and constructed for a special purpose such as to:

1. control the flow of current in an electrical circuit.
2. carry electrical current from the source to the load or current consuming apparatus;
3. hold and secure wires to its fixtures inside and outside houses and buildings; and
4. protect the houses, buildings, appliances and instruments from any destruction and damage.

Here are the common electrical supplies and materials you usually see at home.

MATERIALS AND ITS DESCRIPTION	PICTURES/IMAGES
Convenience outlet. A device that acts as a source of electrical energy for current-consuming appliances. It is where the male plug of an appliance is inserted and usually fastened on the wall or connected in an extension cord. It may be single, duplex, triplex or multiplex. It could be surface type or flush type.	

<p>Male plug. A device inserted to a convenience outlet to conduct electric current. A flat cord is attached to it on one end and the other end is connected to a current consuming instrument or appliance.</p>	
<p>Lamp holders. These are devices that hold and protect the lamp and are also called as “Lamp Sockets/Receptacles”. These come in many designs and sizes. They are classified as flush, hanging (weather-proof/chain) and surface types.</p>	
<p>Switch. a device that connects and disconnects the flow of electric current in a circuit. There are many shapes, designs, and types and they are classified as hanging, flush, and surface types.</p>	
<p>Fuse. A circuit protective device that automatically blows and cut the current when an over load or short circuit happens.</p>	
<p>Circuit breaker. A protective device used to automatically blows and cuts the current when trouble in the circuit such as short circuit or overload occurs.</p>	
<p>Junction box. An octagonal shaped electrical material where the connections or joints of wires are being done. It is also where the flush type lamp holder is attached. This could be made of metal or plastic <i>Polyvinylchloride</i>. (PVC)</p>	
<p>Utility box. A rectangular shaped metallic or plastic (PVC) material in which flush type convenience outlet and switch are attached.</p>	
<p>Flat cord. Is a duplex stranded wire used for temporary wiring installation and commonly used in extension cord assembly. It comes in a roll of 150 meters and with sizes of gauge # 18 and gauge #16 AWG (American wire gauge).</p>	
<p>Electrical Wire/Conductor Electrical material that could be:</p> <p>a. Stranded wire which is made of multiple strands joined together to make a single wire.</p> <p>b. Solid wire is made of a single strand of copper or aluminum wire.</p>	
<p>Conduits/Pipes. Electrical materials used as the passage of wires for protection and insulation. These could be rigid metallic, flexible metallic conduit (FMC), rigid non-metallic (PVC), and flexible non-metallic or corrugated plastic conduit (CPC)</p>	
<p>Clamps. Electrical materials used to hold and anchor electrical conduits in its proper position.</p>	
<p>Connectors. Are used to attach metallic or non-metallic conduit to the junction or utility boxes.</p>	



Remember

- ✓ Electrical tools and equipment are needed to perform the job.
- ✓ Electrical tools and equipment are group into screw drivers, hammers, pliers, wire stripper, electrician's knife, portable electric drill, and hacksaw.
- ✓ Electrical materials are developed for a special purpose such as controlling the flow of current in an electrical circuit, carry electrical current from the source, hold and secure wires and fixtures, and protect your house and buildings from possible destruction and damaged caused by faulty electricity.



Checking Your Understanding











ACTIVITY 1: SUPPLY THE MISSING WORDS

Direction: Fill in the blanks with the correct word/s that will make the statement correct.

1. Circuit breakers are _____ devices used to automatically blow and cuts the current when trouble in the circuit such as short circuit or overload occurs.
2. Convenience outlet is a device that acts as a _____ of electrical energy for current-consuming appliances.
3. A device that connects and disconnects the flow of electric current in a circuit is _____.
4. Flat cord is a _____ used for temporary wiring installation and commonly used in extension cord assembly.
5. A rectangular shaped metallic or plastic (PVC) material in which flush type is _____.
6. A material used to attach metallic or non-metallic conduit to the junction or utility boxes is _____.
7. Lamp holders are devices that hold and protect the lamp and are also called as _____.
8. Fuse is a circuit protective device that automatically blows and cut the current when an _____ or short circuit happens.
9. A tool used by linemen to remove insulation of wire and cables in low and high voltage transmission lines is _____.
10. This is used to drive screws with cross slot heads. This has a cross tip resembling a _____.

ACTIVITY 2: IDENTIFY AND CLASSIFY ME

Directions: Identify and classify the different electrical tools, materials and equipment.

Tools	Name	Classification
		
		
		
		
		
		
		
		
		
		



Post-Test

Directions: Read the statement carefully and identify what is being described or defined. Write your answer on a separate sheet of paper.

1. The blade tip of this screwdriver is wedge-shaped and resembles a negative (-) sign.
A. allen screwdriver
B. flat screw driver
C. side-cutting pliers
D. stubby screw driver
2. A screw driver with short shank and handle which is used to turn screws in tight spaces.
A. allen screw driver
B. flat screw driver
C. side-cutting pliers
D. stubby screw driver
3. The main function of this screwdriver is to drive screw with hexagonal shape.
A. Allen screw driver
B. Flat screw driver
C. Side-cutting pliers
D. Stubby screw driver
4. This tool is used to drive and pull out nails.
A. hammer
B. pliers
C. electrician's knife
D. wire stripper
5. One of most essential tools of electricians. It is made of metal with insulated handles. Electricians use this tool to cut, twist, bend and hold wires.
A. hammer
B. pliers
C. electrician's knife
D. wire stripper
6. This type of pliers is used for cutting fine, medium and bid wires and cables.
A. allen screw driver
B. flat screw driver
C. fide-cutting pliers
D. stubby screw driver
7. A tool used for removing insulation of medium-sized wires raging from gauge #10 to gauge #16.
A. hammer
B. pliers
C. electrician's knife
D. wire stripper
8. A linemen's tool used to remove the insulations of wires and cables in low and high voltage transmission lines.
A. hammer
B. pliers
C. electrician's knife
D. wire stripper
9. These protective devices are used to automatically cut the current when short circuit or overload occurs.
A. fuse
B. hammer
C. pliers
D. wire stripper
10. Made of metal or PVC, octagonal-shaped, where electrical material connections or joints of wires are done.
A. circuit breaker
B. electrician's knife
C. junction box
D. wire stripper

ANSWER KEY

ANSWER KEY:		
Pre Test:		
1. Stubby screw driver	1. Protective	1. Standard/Flat screw driver
2. Phillips screw driver	2. Source	2. Stubby screw driver
3. Male plug	3. Switch	3. Allen screw driver/wrench
4. Conduits	4. Duplex stranded wire	4. Hammer
5. Long nose pliers	5. Utility box	5. Pliers
6. Circuit breaker	6. Connectors	6. Side-cutting pliers
7. Linemen's plier	7. Lamp sockets	7. Wire stripper
8. Hammer	8. Overload	8. Hammer
9. Utility box	9. Electrician's knife	9. Fuse/Circuit breaker
10. Junction box	10. Positive + sign	10. Junction box
Checking Your Understanding:		
Supply the missing words		
Identify Me		
1. Long nose	1. Portable electric drill	1. Standard/Flat screw driver
2. Claw hammer	2. Electrician's knife	2. Stubby screw driver
3. Side cutter	3. Male plug	3. Allen screw driver/wrench
4. Wire stripper	4. Mallet	4. Hammer
5. Lamp holders	5. Convenience outlet	5. Pliers
6. Positive + sign	6. Junction box	6. Side-cutting pliers
7. Electrician's knife	7. Utility box	7. Wire stripper
8. Overload	8. Connectors	8. Hammer
9. Electrician's knife	9. Duplex stranded wire	9. Fuse/Circuit breaker
10. Positive + sign	10. Utility box	10. Junction box

References

1. Electrical materials and tools, Department of Education, **K to 12 Basic Education Curriculum Technology and Livelihood Education** Learning Module

2. Driving tools, retrieved from <https://www.vectorstock.com>

3. Electrical supplies and materials, retrieved from
<https://creativecommons.org>