

TLE-Industrial Arts
**Electrical Installation and
Maintenance**

First Quarter-Module 2 Part 1
Wireways and Cable Tray



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Government Property
NOT FOR SALE

Mayroong pag-asa dahil sa iyo, dahil sa inyong mga kabataan. Ang iyong mga ngiti, tawa, sigla, at likas na kabutihan ang inspirasyon naming mga magulang at guro upang pagbutihin ang pag-aalaga sa iyo, nang maipagpatuloy mo ang iyong pag-aaral at mga libangan.

Lagi ka sanang maging malusog, masayahin, masipag, at mapagmahal.

Ako ay sabik na maghihintay sa iyong pagbabalik sa paaralan sa hinaharap.

- Mayor Marcy





Paano iniwasan ng ating pamilya ang COVID-19?



Inaalagaan ba natin ang ating kalusugan sa pamamagitan ng **sapat na tulog, ehersisyo, at masustansyang pagkain?**



Lagi ba tayong **naghuhugas ng kamay** gamit ang sabon at tubig o mga alcohol-based na produkto?



Pinapanatili ba natin ang kalinisan sa pamamagitan ng **palagiang pagdi-disinfect ng bahay?**



Binubuksan ba natin ang mga bintana para **makadaloy ang hangin** (natural ventilation)?



Iniiwasan ba natin ang **paglabas ng bahay at pagpapapasok ng bisita** kung hindi naman kailangan? Kung may lalabas man, tayo ba ay nagsusuot ng **face mask at face shield**?



Nagbabasa o nakikinig ba tayo sa mga **balita at bagong impormasyon** tungkol sa COVID-19?



Tinatandaan ba natin ang mga **karaniwang sintomas** ng COVID-19? At alam ba natin kung saan tatawag kung sakaling mayroong may sintomas sa pamilya?



Tinuturuan ba tayo ng ating mga magulang at nagiging mabuti ba silang modelo ng mga nabanggit na health at safety protocols?

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Make Marikina COVID-19 Free
Stay safe, stay healthy!



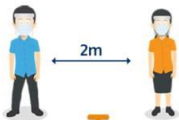
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MGA PAALALA UPANG MAIWASAN ANG COVID-19



Laging magsuot ng face mask at face shield.



Practice Social Distancing
(Dumistansya ng 2 metro kapag nakikipag-usap)



Laging maghugas ng kamay at gumamit ng alcohol.



Kumain ng masustansyang pagkain at uminom ng maraming tubig.



Uminom ng bitamina.



Panatilihing malinis ang kapaligiran.



Manatili lamang sa bahay kung walang mahalagang aasikasuhin at panatilihing ligtas ang tahanan sa COVID-19.



Agad sumangguni sa inyong doktor o pinakamalapit na health center kapag nakaramdam ng mga palatandaan ng COVID-19.

Marikina COVID-19 Hotlines:



0926 626 3695
0927 456 6682
0961 470 3326
0961 470 3327

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HINDI PA TAPOS ANG LABAN SA COVID-19: MGA PAALALA LABAN SA FAMILY CLUSTER INFECTION

Iwasan ang hawaan sa pamilya, gawing ligtas ang tahanan. TANDAAN:



**MARIKINA COVID-19
CALL CENTER**

HOTLINE:

0926-626-3695

0927-456-6682

0961-470-3326

0961-470-3327

**SWAB
TEST**



GAWING LIGTAS ANG TAHANAN.



- Huwag balewalain ang sintomas ng COVID-19
- Sundin ang quarantine protocols
- Huwag munang mag-dine in sa mga kainan/café
- Iwasan ang selebrasyon, inuman, at pagtambay
- Iwasan ang pulutong ng mga tao
- Huwag huhubarin ang face mask kapag nakikipagusap at panatilihin ang 2 meters na distansya
- Iwasan magpapasok ng mga bisita na hindi essential sa loob ng bahay
- Palaging maghugas ng kamay

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marikina**



Hindi kaya ng pamahalaan lamang.
Magkakasama nating talunin ang COVID-19 sa Marikina.
PARA SA LIGTAS NA MARIKINA

Lesson 1

Tools and Equipment used for Wireways and Cable tray Installation

Some wiring problems are just inconveniences. But others can pose serious fire or electrocution hazards. If you're buying a house (especially one that's more than 50 years old), or if you've never had your wiring inspected, it's a good idea to hire a licensed electrician to give your home a thorough going-over but you need to spend some money to do that. Here are some ideas that can help you so let's start to the tools that you might be encountered.



What I Know

Look for words from the given word hunt puzzle. You may encircle the words that you found on the table. These words are relevant to the topic that will be discussed in this lesson.

B	S	S	S	C	R	E	W	D	R	I	V	E	R	V	T	R	O	E	E	D
E	S	H	C	H	H	K	P	L	Y	T	O	P	A	S	D	F	G	H	J	A
I	D	A	F	F	G	N	M	H	T	R	Y	U	Q	J	K	L	Z	Z	I	X
C	J	N	F	S	D	S	P	I	R	I	T	L	E	V	E	L	X	Z	N	C
I	Q	D	A	S	D	F	G	H	J	K	L	U	Q	W	E	R	T	Y	S	F
D	T	T	A	S	S	S	G	H	V	B	B	B	B	L	A	S	D	F	T	I
E	P	O	E	D	A	C	Q	Y	U	I	C	E	C	V	N	M	A	S	A	L
V	U	O	Q	E	R	A	J	A	T	W	W	O	Q	P	I	I	S	J	L	K
B	I	L	N	O	R	B	A	N	T	I	N	E	K	U	L	I	K	L	L	X
J	O	S	A	M	D	L	I	Q	L	M	I	N	V	R	I	T	M	N	A	P
E	O	R	O	R	A	E	E	M	Y	E	L	O	E	O	U	P	K	I	T	Z
O	N	O	N	M	E	T	A	L	L	I	C	T	A	P	A	K	M	N	I	F
T	O	B	K	W	P	R	T	A	E	K	M	O	D	A	T	N	A	E	O	G
B	K	O	A	M	A	A	O	F	I	C	E	K	Y	J	P	O	N	A	N	P
W	I	R	E	W	A	Y	T	U	D	A	T	C	C	E	V	I	T	M	O	T
P	A	K	A	P	R	A	I	G	S	K	E	R	K	N	I	V	N	O	H	P
T	Y	A	O	I	P	I	K	Y	D	D	R	S	I	J	Y	I	N	C	E	Y
M	G	I	T	P	S	U	A	U	P	E	N	O	A	C	L	A	G	T	H	O
Y	P	O	R	S	I	A	M	A	E	T	R	Y	T	B	D	B	N	U	C	A
C	I	O	N	L	D	O	U	R	B	L	E	U	I	E	N	R	R	S	A	H
O	B	O	C	S	I	C	A	R	C	E	A	R	O	R	N	O	I	S	I	H
W	B	C	K	U	C	O	N	P	H	E	I	M	N	G	Y	S	N	L	K	J
A	Q	W	E	R	T	Y	F	E	T	G	H	J	E	W	Q	P	H	H	L	L





What's In

As an electrician, you know that you can't do your job without the right electrical tools and equipment. While there's no substitute for your knowledge, without your trusty tools both basic and advanced, you'll be limited.

Wireways are designed to protect cables from environmental contaminants such as dust, dirt, oil, and water. It also called as "troughs" or "gutters" and can be mounted to walls or ceilings, secured under flooring, or laid out in a hybrid design in unique cable management systems.

A wireway is also produced as a **metallic or non-metallic** trough with hinged or removable covers, so that the cables contained are well-protected but still accessible.

(Example Image of Metallic Wireway)



An image of metallic wireway photo taken from a certain grocery



What Is It

Equipment for Wireway and Cable Tray Installation

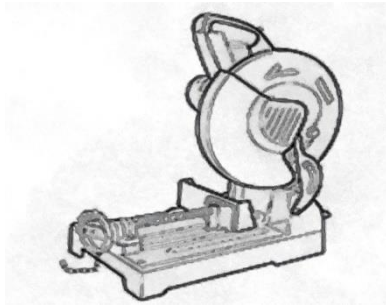


Image Example of metal Cutting Saw

1. Metal Cutting Saw

A kind of power tool which is typically used to cut hard materials. The cutting action is performed by an abrasive disc, similar to a thin grinding wheel.

2. Electric Drill

A drill is an equipment primarily used for making round holes or driving fasteners. It is fitted with a bit, either a drill or driver, depending on application, secured by a chuck.

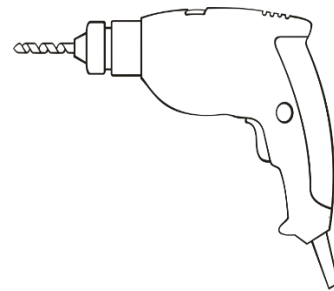
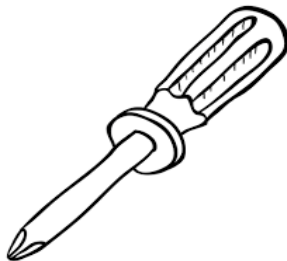


Image example of Electric Drill

Tools for Wireway and Cable Tray Installation



1. Screw Driver

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

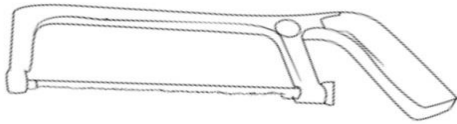
2. File

This is a tool used to remove fine amounts of material from a work piece. It is common in woodworking, metalworking and have variety of types ex. (flat, hand, square, round, half-round, triangular and knife edge.



3. Open end wrench

It is a hand tool with open jaws both end used to tighten and loosen the bolt and nut



4. Hack Saw

It is originally and principally made for cutting metal, but can also cut various other materials, such as plastic and wood, electricians often use this to cut plastic pipe and plastic conduit.

5. Spirit Level

It also known as bubble level or simply a level is an instrument designed to indicate whether a surface is horizontal (level) or vertical (plumb).



6. Meter

Commonly used by the electrician an instrument for measuring the area or distance.

7. L-Square

The main purpose of the square is to ensure that the components are perpendicular or at right angles to each other. In addition, most squares serve as measurements ruled marked in inches, fractional inches, and sometimes centimeters and millimeters.



8. C-clamp

The C clamp is useful for clamping wood or metal; the hands crew is used for clamping wood objects at an angle. Most clamps have a face and an adjustable screw.

9. Torque Wrench

They're all tools designed to both fasten properly and to prevent over-tightening or under-tightening a bolt. Over-tightening can cause damage to the fastener, and under-tightening can result in making the item you are attaching or assembling structurally weak and potentially unsafe for use.



10. Ratchet

A mechanism in the ratchet allows the handle to engage and tighten a fastener when you swing it in a clockwise direction but turn freely when you swing it counterclockwise



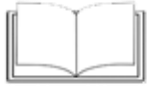
11. Offset Bolt Cutter

A bolt cutter is a tool used to cut all sorts of metal. It cutters come with a variety of heads, with differently beveled blades that are designed to accommodate slightly different tasks. In most cases, it is the shape of the blades that will define a bolt cutter's type (Hinges, Centre cut bolt cutters, Clipper cut and angled bolt cutters, Shear cut, End cut, Ratchet bolt cutter, Compact bolt cutter, and hydraulic bolt cutter).



Remember

Use the right tools and right method to decrease amount of effort and to get a job done right without causing damage to either the equipment or to the surface being worked on.



What's More

Write the purpose of the following tools and equipment. (3 points each)

1. Electric Drill

2. File

3. Screw Driver

4. C-Clamp

5. Metal cutting saw



What I Have Learned

Answer the following question below.

1. Why do you need to choose the right tools for the right job or activity?
2. What do you think the advantage of using equipment?

RUBRICS FOR ESSAY TYPE

CRITERIA	SCORING GUIDE				Student's Rating
	(8-10)	(5-7)	(2-4)	(0-1)	
Organization	The introduction is relevant and presented in logical order. The conclusion is included and clear	The introduction is presented relevant to the topic. The conclusion is included, but does not strengthen the answer	The introduction is presented and few relevant to the topic. The conclusion is included, but not especially relevant	No clear introduction and conclusion	
Details	Main ideas are clear and well supported by detailed and accurate info.	Main ideas are clear but are not supported by detailed info.	Main ideas are not especially clear	Main ideas are not clear	
Sentence, Grammar and Spelling	All sentence are well-constructed, there are very few errors in grammar or spelling	Most sentence are well-constructed, there are very few errors in grammar or spelling	Most sentence are well constructed but, there several errors in grammar or spelling.	Words in sentence are repetitive, there are numerous errors in grammar or spelling.	
Total Score 30 points					



What I Can Do

OFFLINE ACTIVITY

Choose one equipment or tools from the topic. Illustrate or draw it on a separate sheet of paper then right your insight about using this tool/equipment.

RUBRICS FOR ILLUSTRATION/DRAWING

CRITERIA	SCORING GUIDE				Student's Rating
	(8-10)	(5-7)	(2-4)	(0-1)	
Skills	Perform skills and/or expresses creativity a high level	Perform skills and/or expresses creativity at a proficient level	Perform skills and/or expresses creativity at basic level	Does not perform skills and/or expresses creativity at an appropriate level	
Work Quality	Present all work neatly and with care	Present most work neatly and with care	Present some work neatly and with care.	Present work with little neatness or care	
Total Score 20 points					

ONLINE ACTIVITY

Create a PowerPoint presentation about safety practices of using equipment and hand tools insert some captions in each pictures to explain the ideas in the inserted photos. Send your soft copy to the link/email given by your teacher.

RUBRICS FOR THE ACTIVITY

	5	4	3	2	1
Content	Content is accurate and all required information is presented in a logical order.	Content is accurate but some required information is missing and/or not presented in a logical order, but is still generally easy to follow.	Content is accurate but some required information is missing and/or not presented in a logical order, making it difficult to follow.	Content is questionable. Information is not presented in a logical order, making it difficult to follow.	Content is inaccurate. Information is not presented in a logical order, making it difficult to follow.
Slide Creation	Presentation flows well and logically. Presentation reflects extensive use of tools in a creative way.	Presentation flows well. Tools are used correctly. Overall presentation is interesting.	Presentation flows well. Some tools are used to show acceptable understanding.	Presentation is unorganized. Tools are not used in a relevant manner.	Presentation has no flow. No tools used.
Slide Transitions	Transitions are smooth. Transitions enhance the presentation.	Smooth transitions are used on most slides.	Smooth transitions are used on some slides	Very few transitions are used and/or they distract from the presentation.	No transitions are used.
Pictures, Clip Art Background	Images are appropriate. Layout is pleasing to the eye.	Images are appropriate. Layout is cluttered.	Most images are appropriate	Images are inappropriate.	No images
Mechanics	No spelling errors. No grammar errors. Text is in authors' own words.	Few spelling errors. Few grammar errors. Text is in authors' own words.	Some spelling errors. Some grammar errors. Text is in authors' own words.	Some spelling errors. Some grammar errors. Most of text is in authors' own words.	Many spelling and or grammar errors. Text is copied.
	Total 25 pts				



Assessment

Write **T** if the statement is True. If it is false **change the underlined** word or group of words that makes it false and then write the correct one on the spaces provided.

_____ 1. Spirit level is an instrument designed to indicate whether a surface is horizontal (level) or vertical (plumb)

_____ 2. Screw driver is an equipment primarily used for making round holes or driving fasteners?

_____ 3. The main purpose of the square is to ensure that the components are perpendicular or at right angles to each other.

_____ 4. Hack saw commonly used by the electrician as an instrument for measuring the area or distance.

_____ 5. The C clamp is useful for clamping wood or metal; the hands crew is used for clamping wood objects at an angle.



Additional Activities

Match Column **A** with Column **B**. Write only the letter of the correct answer on the space provided before the number.

A

_____ 1. This ruler helps to create accurate 90° angles and straight edges.

_____ 2. A device typically used to hold a wood or metal work piece.

_____ 3. An instrument for measuring the area or distance.

_____ 4. A device for determining true horizontal or vertical directions by the centering of a bubble in a slightly curved glass tube.

_____ 5. It is equipment primarily used for making round holes or driving fasteners.

B

A. C-Clamp

B. Spirit Level

C. Hack saw

D. Electric Drill

E. Meter

F. L-Square





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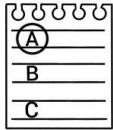
Electrical Installation and Maintenance NCII – Grade 9

Alternative Delivery Mode

Quarter 1 – Module 2 Part 1: Wireways and Cable Tray

Lesson 1: Tools and Equipment used for Wireways and Cable Tray Installation

First Edition, 2020



Answer Key

Lesson 1

**WHAT I KNOW
(WORD HUNT)**

EQUIPMENT	•
INSTALLATION	•
SPIRIT LEVEL	•
METER	•
SCREW DRIVER	•
ELECTRIC DRILL	•
NON METALLIC	•
WIREWAY	•
CABLE TRAY	•
HAND TOOLS	•

**ASSESSMENT
(Modified True or False)**

1. T
2. Electric Drill
3. T
4. Meter
5. T

Additional Activities

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

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