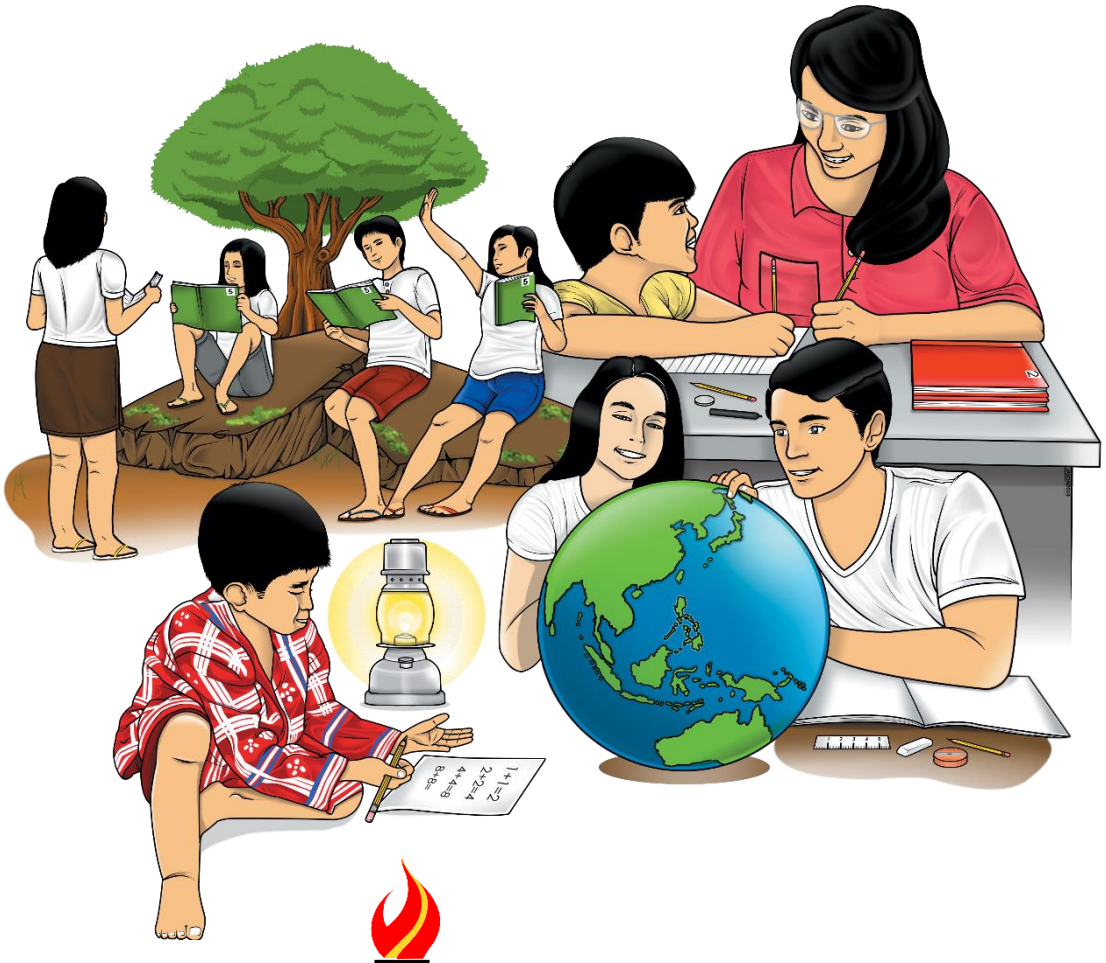
7/8

DepED
DEPARTMENT OF EDUCATION

TLE (SMAW)

Module 1:
USE BASIC HAND TOOLS AND EQUIPMENT (UT)



ALTERNATIVE DELIVERY MODE
ADM

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Alternative Delivery Mode
Module 1: Use Basic Hand Tools and Equipment (UT)
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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.

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Don't forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instructions carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain a deep understanding of the relevant competencies. You can do it!

What I Need to Know

Welcome to the world of Shielded Metal Arc Welding (SMAW)!

This Module is an exploratory course, which leads you to **Shielded Metal Arc Welding** [SMAW] National Certificate Level II [NC II]. It covers common competencies for you to possess.

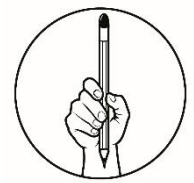
These competencies are:

1. Preparing hand tools before the actual servicing activities,
2. and using appropriate hand tools for a specific job.

Learning Objectives:

At the end of the lesson, you are expected to do the following:

1. Identify the different basic hand tools, materials, and equipment used in Shielded Metal Arc Welding;
2. Manipulate the tools and materials in a job/task according to their uses. *(TLE_IAAW7/ 8UT-Oa-I)*



What I Know

Pre Test

Let us determine what proportion you already realize in identifying materials and tools applicable to a selected construction job.

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

1. A _____ is a tradesperson who specializes in fusing materials and fabricates or puts together metal parts.
   A. Carpenter
   B. Welder
   C. Engineer
   D. Auto-mechanic

2. It is a tool used to measure or set distances, and layout arcs and circles.
   A. Divider
   B. Hacksaw
   C. Plier
   D. Try square

3. It is rectangular and tapered slightly in width and thickness. It is the foremost commonly used file for general work.
   A. Divider
   B. Hacksaw
   C. Plier
   D. Try square

4. It is used for chipping flat surfaces, cutting of rivets or metal fasteners, thin sheets, small bars; and for general purposes.
   A. Cold Chisel
   B. Hacksaw
   C. Plier
   D. Try square

5. It is a tooth cutting tool usually with a solid and adjustable frame.
   A. Hammer
   B. Screwdriver
   C. Wrench
   D. None of the above

6. It is a tool used for loosening and tightening light and heavy nuts and bolts.
   A. Hacksaw
   B. Screwdriver
   C. Wrench
   D. None of the above

7. This tool is used to tighten and loosen screws by pushing or pulling screws in a rotating manner.
   A. Hammer
   B. Screwdriver
   C. Wrench
   D. None of the above

8. This is a flexible rule, when extended will support itself, but may also be used to measure curved, irregular surfaces.
   A. Push-pull
   B. Screwdriver
   C. Hammer
   D. Claw hammer

9. A _____ is any tool that is powered by hand rather than a motor.

A. Hand Tool
B. Cleaning Tool
C. Diagnostic Tool
D. None of the above

10. This device is designed to hold work securely while performing skills through grinding, bending, fitting, and cutting of metals.
A. Push-pull
B. Screwdriver
C. Clamp
D. Claw hammer

Use Basic Hand Tools and Equipment (UT)

Metal Arc welding is such an important part of our lives. Buildings and infrastructural projects are dependent on metal works and they play an important role especially on construction works. It is necessary for the industry to have expert and skilled persons in relation to metal works and products. Without them, building construction projects will fail to accomplish because of the lack of metal specialized workers. Basic hand tools are essential whenever repair or servicing is needed in this field of work. This module will surely guide you in preparing and using appropriate hand tools before you do the actual repair and servicing in relation to metal works.

What's In

Do you have some welding materials at home? Can you identify those materials? I think you should because some of those materials are used in metal works by our welders in building construction trades. However, if not, here, you are going to explore the construction materials, tools and equipment.

Image Source:
https://commons.wikimedia.org/wiki/File:Shielded_Metal_Arc_Welding.jpg palmer.html

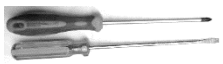
Notes to the Teacher

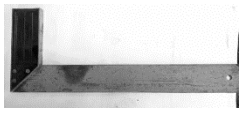
Good day! You are now directing into more exciting and meaningful activities. Complete the activities by answering the worksheet to explore real learning skills.

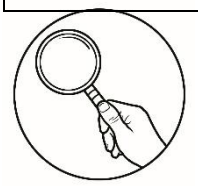
What's New

Activity 1: Matching Type

Direction: Match the words in Column A with the correct illustration of the different metal works tools and equipment from Column B.

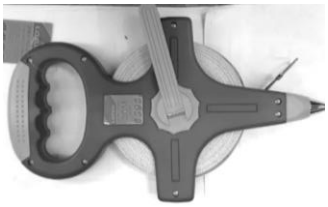
Column A	Column B
1. Pull-push rule	A. 
2. Pliers	B. 
3. Punches	C. 
4. Try square	D. 
5. Dividers	E. 

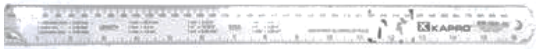
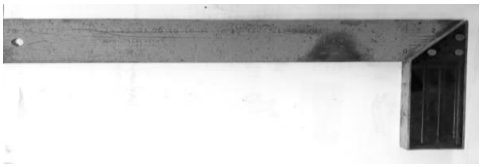
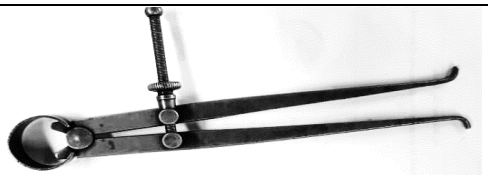
6. Hacksaw 7. Ball Hammers 8. Machinist vise 9. C-Clamp 10. Screwdriver	F.  G.  H.  I. J. 

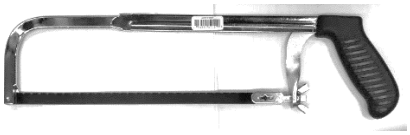


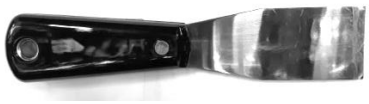
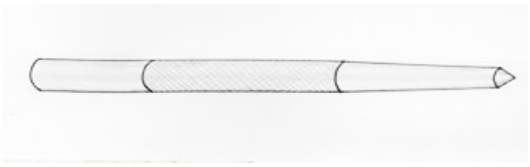
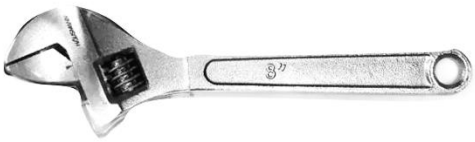
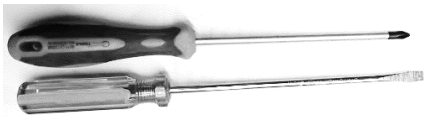
What is It

Welders and any work related to metal works cannot do their job without these materials and tools. These materials make the work of welder easier in building walls, structures and walkways. Here are some SMAW materials and tools.

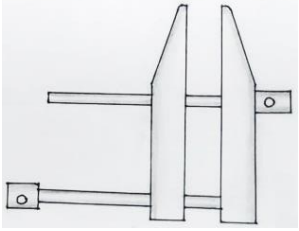
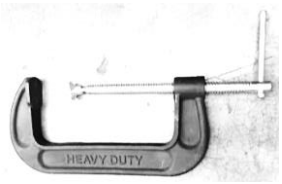
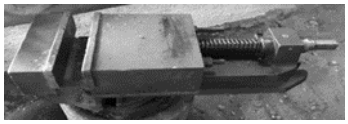
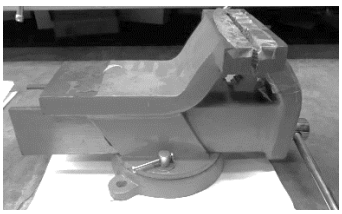
A. Measuring tools **Measuring tools are used to measure the dimension of an object or metal.**	
Pull-push rule. This flexible rule when extended will support itself, but can also be wont to measure curved, irregular surfaces. Steel tape rule blade is typically ½ inch wide and 72 inches long. The graduation is sixteenths, except for the first 6 inches which are graduated in thirty-seconds of an inch.	
Steel tape. It is analogous to a steel tape rule apart from its flexible number of feet that are marked on the tape. The tape is 3/8-inch-wide and available in lengths from 25 to 100 feet.	
Steel rule. This is the foremost common tool utilized in the tool room. It is made of tempered steel about 1/8-	

inch-thick and ¾ inch wide and 6 to 12 inches long. The same style may be obtained in length from 1 to 48 inches.	
Try square. It is an instrument used to measure the square of an object.	
Combination square. It is an instrument combined with 45°, 90°, and a protractor.	
Micrometer caliper. It is a precision measuring instrument used to measure dimensions in thousandths of an inch.	
Vernier caliper. It is a precision measuring instrument used to measure the inside, outside diameter, as well as the depth of hole and slot.	
Dividers. These are used for measuring or setting of distances, and to layout arcs and circles.	

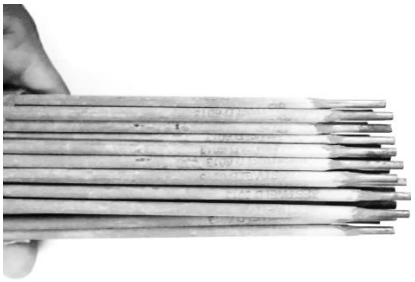
B. Cutting Tools	
Hacksaw. A toothed cutter usually with a solid and adjustable frame. The main parts are handles, blade, tightening screw, and nuts.	
Files. Are made from high-grade steel which is hardened and tempered. Each file has rows of teeth that form, shape,	

and finish metal by removing small chips and smoothing rough edges of the metal surface.	
Chisel. A wedge-shaped tool used to shear, cut, and chip metal.	
Scraper. It is used in removing points, burrs, and sharp edges from the metal surface and similar parts.	
C. Marking Tools	
Punches. Are used for permanent marking on the surface of metal.	
D. Driving Tools	
Ball peen hammer. It is employed for straightening, bending, and deforming metals. It has two faces. Some is flat in striking cold chisels and punches.	
Chipping hammer. It is employed for removing slag on the weld and with two faces, the taper from one side and round pointed on the opposite side.	
Wrench. It is used for loosening and tightening light and heavy nuts, and bolts.	
Screwdriver. It is used to tighten and loosen screws by pushing or pulling screws in a rotating manner.	

E. Holding Tools

Toolmaker clamp. It is employed for holding small parts both at the bench and at the machine. This tool is additionally referred to as a parallel clamp.	
C-Clamp. Is an all-purpose clamp that is generally used for all types of labor.	
Drill vise. A sturdy steel vise with a movable jaw that easily goes back or forth by raising the handle.	
Machinist vise. A work holding tool for machining activity.	
Hand vise. V block with clamp is employed to carry metal stocks for little machining operation.	
Vise-Grip. A tool used to grip the stock tight enough to carry the thing.	

F. Arc Welding Equipment and Materials	
Tong. It is used to hold the metal to be forged and must be held securely while working.	
Pliers. Used for holding, cutting, and twisted wires.	

Electrode Holder. A handle like a tool that holds the electrode during welding. It receives amperage and directs it through the electrode to form an arc and should be well insulated and free from defect.	
Welding Machine. Shielded Metal Arc Welding machine is the main part of this process, because without the machine certainly, we cannot do the welding process.	
Welding rod/ Electrode. Consists of an internal metal core and an outer coating called flux. -Metal core melts into the molten base metal. -Flux is turned into a gas shield as it burns away.	

Activity No. 2

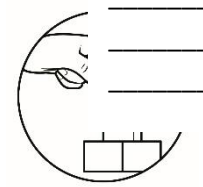
Guide Questions: Answer the following questions and write your answer in your activity notebook.

1. Have you seen any tool in relation to metal works in your community? Give five (5) examples.

_____
_____
2. Wh _____
_____
_____

3. Why do you think these materials and tools are beneficial to metal works?

_____
_____
_____
_____
_____



Activity 3:

Direction: Supply what is defined or described. Write your answer on your activity notebook.

_____ 1. It is similar to a steel tape rule except for its flexible number of feet that are marked on the tape.

_____ 2. It is an instrument used to measure the square of an object.

_____ 3. These are used for measuring or setting of distances, and to get out arcs and circles.

_____ 4. It is a tooth cutting tool usually with a solid and adjustable frame.

_____ 5. It is a wedge-shaped tool wont to shear, cut, and chip metal.

_____ 6. It is used in removing points, burrs and sharp edges from metal surface and similar parts.

_____ 7. It is used for permanent marking on the surface of metal.

_____ 8. It is used for removing slag on weld and with two faces, the

tapered from one side and round pointed on the opposite side.

_____ 9. They are used for holding, cutting and twisting wires.

_____ 10. It is used to hold the metal to be forged and must be held securely while working

What I Have Learned

Direction: Fill in the blank. Select the answer provided inside the box. Write your answer in your activity notebook.

Plier	Wrench	Scraper
Chisel	Divider	Try Square

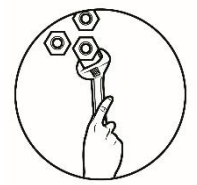
1._____ is used for measuring or setting of distances, and to layout arcs and circles.

2. _____ is an instrument used to measure the square of an object.

3. _____ is a wedge-shaped tool used to shear, cut, and chip metal.

4. _____ is used for holding, cutting and twisted wires.

5. _____ is a tool used for loosening and tightening light and heavy nuts and bolts.



What I Can Do

Activity 4:

Direction: Suppose you were told to repair and improve the appearance of the damaged metal fence of a house. The problem is your tight budget. What will you do?

a. What metal works materials and tools will you use?

_____
_____
_____
_____

b. Why did you choose such materials and tools?

_____
_____
_____
_____

c. What will you do to determine the right quantity of the materials needed

_____
_____
_____
_____

d. What factors do you consider in selecting and using SMAW Tools?

_____
_____
_____
_____

e. List down tools that help you get an accurate and exact measurement.

_____
_____
_____
_____

Assessment

Post-test:

Let us determine how much you already know about identifying materials and tools applicable to a specific construction job.

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

1. A _____ is a tradesperson who specializes in fusing materials together and fabricates or puts together metal parts.
   A. Carpenter
   B. Welder
   C. Engineer
   D. Auto-mechanic

2. It is a tool used for measuring or setting of distances, and to layout arcs and circles.

A. Divider
B. Hacksaw
C. Plier
D. Try square

3. It is rectangular in shape and tampered slightly in width and thickness. It is the most commonly used files for general work.
A. Divider
B. Hacksaw
C. Plier
D. Try square

4. It is used for chipping flat surfaces, cutting of rivets or metal fasteners, thin sheets, small bars; and for general purposes.
A. Cold Chisel
B. Hacksaw
C. Plier
D. Try square

5. A tooth cutting tool usually with a solid and adjustable frame.
A. Hammer
B. Screwdriver
C. Wrench
D. None of the above

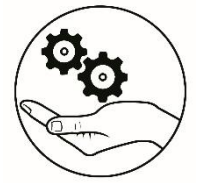
6. It is a tool used for loosening and tightening light and heavy nuts and bolts.
A. Hacksaw
B. Screwdriver
C. Wrench
D. None of the above

7. This tool is used to tighten and loosen screws by pushing or pulling screws in a rotating manner.
A. Hammer
B. Screwdriver
C. Wrench
D. None of the above

8. This flexible rule when extended will support itself, but may also be used to measure curved, irregular surfaces.
A. Push-pull
B. Screwdriver
C. Hammer
D. Claw hammer

9. A _____ is any tool that is powered by hand rather than a motor.
A. Hand Tool
B. Cleaning Tool
C. Diagnostic Tool
D. none of the above

10. This device is designed to hold work securely while performing skills through grinding, bending, fitting, and cutting of metals.
A. Push-pull
B. Screwdriver
C. Clamp
D. Claw hammer

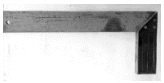


Additional Activities

Activity 4:

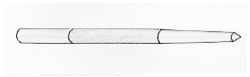
Complete the lines in the box for the word search.












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

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Answer Key

Pre-Test

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

Activity 1

1. J
2. I
3. H
4. G
5. F
6. E
7. D
8. C
9. B
10. A

Activity 3

1. Steel tape
2. Try square
3. Divider
4. Hacksaw
5. Chisel
6. Scraper
7. Punches
8. Chipping hammer
9. Plier
10. Tong

Activity 4:

CHISEL
WRENCH
PLIER
TRYSQUARE
DIVIDER
TONG
SCRAPER
PUNCHES
HACKSAW
STEEL RULE

Post-Test

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

What I have Learned

1. Divider
2. Try square
3. Chesil
4. Plier
5. Wrench

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