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Kagawasan Ave., Daro, Dumaguete City, Negros Oriental



TLE-IA-CARPENTRY

Quarter 1 – Module 3: PREPARE TOOLS, MATERIALS AND EQUIPMENT FOR STAKING OUT BUILDING LINES



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TLE - CARPENTRY – Grade 9

Alternative Delivery Mode

Quarter 1 – Module 3: Preparing Tools, Materials and Equipment for Staking Out Building Lines

First Edition, 2020

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TLE-IA-CARPENTRY

Quarter 1 – Module 3: PREPARING TOOLS, MATERIALS AND EQUIPMENT FOR STAKING OUT BUILDING LINES



Introductory Message

For the facilitator:

Welcome to the TLE-IA-CARPENTRY (9) Alternative Delivery Mode (ADM) Module on Preparing Tools, Materials and Equipment for Staking Out Building Lines!

This module was collaboratively designed, developed and reviewed by educators both from public and private institutions to assist you, the teacher or facilitator in helping the learners meet the standards set by the K to 12 Curriculum while overcoming their personal, social, and economic constraints in schooling.

This learning resource hopes to engage the learners into guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st century skills while taking into consideration their needs and circumstances.

In addition to the material in the main text, you will also see this box in the body of the module:



Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learners.









As a facilitator, you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Furthermore, you are expected to encourage and assist the learners as they do the tasks included in the module.




For the learner:

Welcome to the TLE - CARPENTRY (9) Alternative Delivery Mode (ADM) Module on Preparing Tools, Materials and Equipment for Staking Out Building Lines!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning resource while being an active learner.

This module has the following parts and corresponding icons:

 <i>What I Need to Know</i>	This will give you an idea of the skills or competencies you are expected to learn in the module.
 <i>What I Know</i>	This part includes an activity that aims to check what you already know about the lesson to take. If you get all the answers correct (100%), you may decide to skip this module.
 <i>What's In</i>	This is a brief drill or review to help you link the current lesson with the previous one.
 <i>What's New</i>	In this portion, the new lesson will be introduced to you in various ways; a story, a song, a poem, a problem opener, an activity or a situation.
 <i>What is It</i>	This section provides a brief discussion of the lesson. This aims to help you discover and understand new concepts and skills.
 <i>What's More</i>	This comprises activities for independent practice to solidify your understanding and skills of the topic. You may check the answers to the exercises using the Answer Key at the end of the module.
 <i>What I Have Learned</i>	This includes questions or blank sentence/paragraph to be filled in to process what you learned from the lesson.
 <i>What I Can Do</i>	This section provides an activity which will help you transfer your new knowledge or skill into real life situations or concerns.

 Assessment	This is a task which aims to evaluate your level of mastery in achieving the learning competency.
 Additional Activities	In this portion, another activity will be given to you to enrich your knowledge or skill of the lesson learned.
 Answer Key	This contains answers to all activities in the module.

At the end of this module you will also find:

References

This is a list of all sources used in developing this module.

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 instruction 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 deep understanding of the relevant competencies. You can do it!



What I Need to Know

In this module you will learn more about preparing tools, equipment and materials for stakeout building lines. It is here to help you understand more about carpentry. The scope of this module permits its use in n many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course.

The module has one lesson:

Lesson 1 - Economic use of materials & Basic geometrical construction

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

1. Identify the benefits of environmental sustainable work practices.
2. Draw and divide a straight line using a compass.
3. Follow steps in basic geometrical construction on carpentry.



What I Know

Directions: Read each item carefully. Match column A with column B. Write the letter of the correct answer on your activity notebook.

Column A

1. means to draw shapes, angles, or lines accurately
2. Reduced materials in production of buildings.
3. Improved working conditions
4. Reduced emissions
5. The ability or capacity of something to be maintained or to sustain itself.
6. Reduced energy and water usage and costs
7. Improved business social responsibility performance
8. Reduction in carbon footprint
9. Increased marketability
10. Increase productivity

Column B

- A. Employee Engagement
- B. Reputation
- C. Financial benefit
- D. Reputation
- E. Environmental
- F. Construction
- G. Environmental
- H. Financial benefit
- I. Employee Engagement
- J. Sustainability

Note: If you get 100% correct in this pre-assessment, skip the lesson but if not and only get 50% to 99% correct, then proceed with the lesson.

Lesson 1

Economic Use of Materials & Basic Geometrical Construction

In this module, you will learn about economic use of materials and basic geometrical construction which are very essential in Carpentry. With this, it is necessary that you will read thoroughly in order for you to be effective in your self-paced learning.



What's In

LET'S REVIEW!

Instructions: Choose the correct answer from the given options. Write your answers in your activity notebook.

1. Which of the following benefits of wood in construction where it has the ability to bend under pressure without breaking?
 - a. resistant to electrical currents
 - b. thermal properties
 - c. tensile strength
 - d. highly-sought-after acoustic properties
2. Lumber grade that contains 50% usable material on a 3" x 4" board face.
 - a. #2 com
 - b. #1 com
 - c. sel
 - d. FAS
3. Lumber grade that contains 66% usable material on a 3" x 4" board face.
 - a. #2 com
 - b. #1 com
 - c. sel
 - d. FAS
4. Lumber grade that contains small, tight knots that won't fall out; offers a high-quality knotty appearance (e.g., pine).
 - a. d select
 - b. 1 common
 - c. 2 common
 - d. 3 common
5. Tips in estimating materials where you have to listen to your client and understand his requirements.
 - a. cost of labor
 - b. additional details
 - c. final estimate
 - d. data collection



What's New

Directions: Read each item carefully. Match column A with column B. Write the letter of the correct answer on your activity notebook.

Column A

1. means to draw shapes, angles or lines accurately
2. Reduced materials in production of buildings.
3. Improved working conditions
4. Reduced emissions
5. The ability or capacity of something to be maintained or to sustain itself.
6. Reduced energy and water usage and costs
7. Improved business social responsibility performance
8. Reduction in carbon footprint
9. Increased marketability
10. Increase productivity

Column B

- A. Employee Engagement
- B. Reputation
- C. Financial benefit
- D. Reputation
- E. Environmental
- F. Construction
- G. Environmental
- H. Financial benefit
- I. Employee Engagement
- J. Sustainability

Note: If you get 100% correct in this pre-assessment, skip the lesson but if not and only get 50% to 99% correct, then proceed with the lesson.



What is It

ENVIRONMENTAL SUSTAINABILITY IN CARPENTRY

Good construction practices pave the way for excellent buildings, but what happens when you build irresponsibly? Building irresponsibly can cause excessive waste, contamination and devastation that lasts for generations.

Waste that comes from construction and demolition of buildings, accounts for an astonishing 40 percent of our national waste. Not surprisingly, this has a significant impact on the environment.

When you work in the construction industry, consider employing the following knowledge and earth-friendly practices to reduce your environmental impact on our world and save money too.

WHAT IS SUSTAINABILITY?

Sustainability is based on a simple principle: Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment.

Sustainability creates and maintains the environment under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations.

Sustainability is important to making sure that we have and will continue to have, the water, materials, and resources to protect human health and our environment.

Sustainability is about people and culture, our environment, jobs and money. Is it about cities and the country and it is about you and me and how we interact and work in our environment.



Pine forest plantation

Sustainability is the ability or capacity of something to be maintained or to sustain itself. It is about taking what we need to live now, without jeopardizing the potential for people in the future to meet their needs.

If an activity is said to be sustainable, it should be able to continue forever. Increasingly our lifestyle is placing more and more pressure on natural systems. Scientists continue to investigate how human interactions with natural systems can be improved and sustained.

Successfully managing available resources is essential to achieving environmental, social and economic sustainability.

BENEFITS OF ENVIRONMENTAL SUSTAINABLE WORK PRACTICES

There are real benefits for introducing sustainability into your everyday building practice

Any building company that reduces the amount of material it uses to produce the same construction will see the financial benefits of implementing sustainability programs in their company. The benefits can be financial, employee engagement, reputation and environmental.

Financial benefit

- Reduced energy and water usage and costs
- Reduced material, waste and associated costs
- Reduced materials in production of buildings.



Save money

Employee Engagement

- Improved working conditions
- Increase productivity



Building a house

Reputation

- Improved business social responsibility performance
- Reduced liability and risk management
- Improved competitiveness and market positioning
- Increased marketability



Living green is best

Environmental

- Reduction in carbon footprint
- Reduced emissions
- Position to influence supply chain.



New growth forest

BUILDING WASTE AND RESOURCE RECOVERY

A building company has the responsibility to ensure landfill waste facilities and receptacles are established in all building sites at convenient and accessible locations consistent with requirements as outlined in government legislation and policies.

Recycle where you can

A building company also needs to ensure recycling facilities and receptacles are established and maintained in all building sites at convenient and accessible locations.

Recycle bins cost less to hire than a mixed waste bin



Recycle where possible

Basic Geometrical Construction

Architects, civil engineers, landscape architects and town planners among many other professionals have to be able to produce accurate plans well before the builder moves onto a site to begin construction. With the advent of CAD/CAM packages it is easy to forget that only thirty years ago technical drawing skills were an essential part of the education of all engineers and architects. In the same way as the electronic calculator does not remove the need to be able to calculate, CAD/CAM does not remove the need to be able to draw accurate figures.

Geometrical constructions should be drawn with a sharp, hard (2H) pencil. A pencil eraser, a ruler marked in centimeters (often used as a straight edge), a pair of compasses, two set squares (90°, 60°, 30° and 90°, 45°, 45°) and a protractor with a radius of at least 5cm make up the basic set of geometrical instruments.

"Construction" in Geometry means to draw shapes, angles or lines accurately.

- These constructions use mainly compass, straightedge (i.e. ruler) and a pencil.
- This is the "pure" form of geometric construction where no numbers are involved.
- While drawing these constructions, you need to use a sharp medium-hard lead (H to 3H).
- Draw construction lines extremely light and all main lines medium to thin but dark.

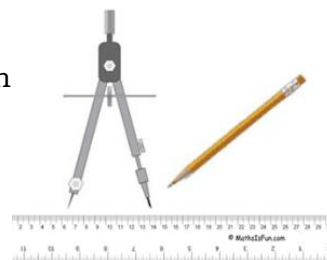


Fig.2.1: Tools used in geometric construction

Geometric Constructions by Using a Compass

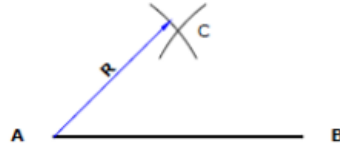
A. Bisecting a Straight Line

1. Draw a line AB, and then place the compass at one end of line. Fig. 2.2a.



Fig.2.2a

2. Adjust the compass to slightly longer than half the line length. Draw arcs above and below the line. Keeping the same compass width, draw arcs from other end of line as shown in Fig. 2.2b.



3. Place ruler where the arcs cross, and draw the line CD to bisect AB.

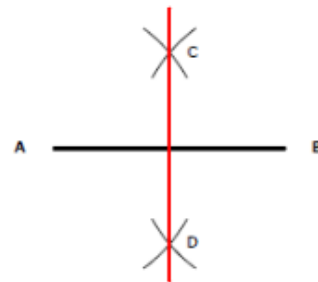


Fig.2.2c

B. Bisecting an Angle

An angle bisector divides the angle into two angles with equal measures.

1. Draw any angle CAB. Fig. 2.3 a.

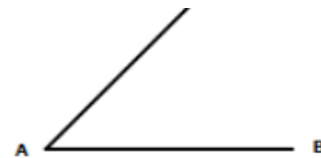


Fig. 2.3 a

2. Set compasses to any suitable radius with the compass point on point A and mark P & O as shown in Fig. 2.3 b.

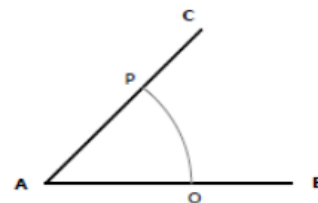


Fig. 2.3 b

3. Using the same radius, draw arcs from the points P & O to intersect at N. Fig. 2.3 c.

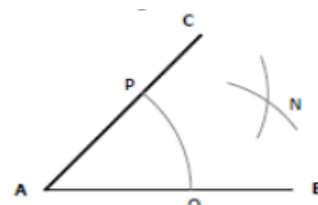


Fig. 2.3 c

C

4. Draw a line from N to A to bisect the angle CAB. Fig. 2.3 d.

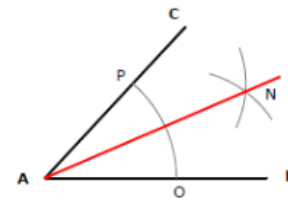


Fig. 2.3 d

Constructing a regular hexagon given one side length.

1. Draw a line segment AF with a specific length (Fig. 2.4a)
2. Set the compass point on A, and set its width to F. The compass will remain at this setting until the end of the construction process. (Fig. 2.4b)
3. From points A and F, draw two arcs so that they intersect. Mark this as point O. This is the center of the hexagon's circum circle. (Fig. 2.4c)



Fig. 2.4 a



Fig. 2.4 b

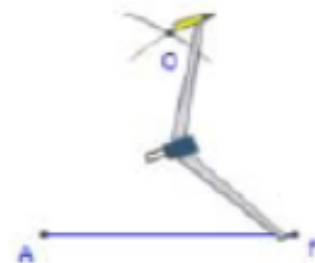


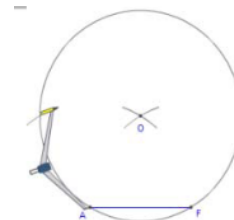
Fig. 2.4 c

4. Move the compass to O and draw a circle. This circle will pass through all six vertices. (Fig. 2.4d)

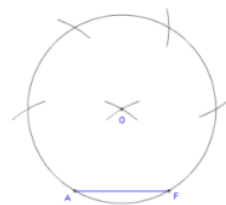


Fig. 2.4 d

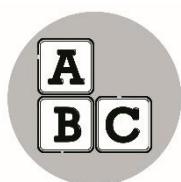
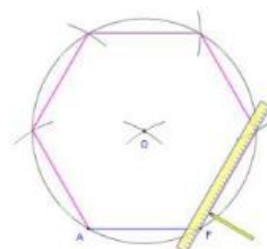
5. Move the compass on to A and draw an arc across the circle. This is the next vertex of the hexagon.



6. Move the compass to this arc and draw an arc across the circle to create the next vertex. Fig. 2.4 f.



7. Draw a line between each successive pairs of vertices. Fig. 2.4 g



What's More

Directions: Read each statement or question below. Fill in the blank(s) with the correct answer. Answer may be more than one word.

Constructing a regular hexagon given one side length.

1. Draw a _____ AF with a specific length.
2. Set the _____ point on A, and set its width to F. The compass will remain at this setting until the end of the construction process.
3. From points A and F, draw _____ arcs so that they intersect. Mark this as point O. This is the center of the hexagon's circle.
- 4-5. Move the compass to O and draw a _____. This circle will pass through all _____.
- 6-7. Move the compass on to A and draw an arc _____ the circle. This is the next _____ of the hexagon.
- 8-9. _____ the compass to this arc and _____ an arc across the circle to create the next vertex.
10. Draw a line between each successive _____ of vertices.



What I Have Learned

Carpentry is one of the most traditional roles in the construction industry. Carpenters are needed for almost every construction project, so if you want to be one of them, the first thing you need to do is to know the basic tools used in carpentry. It is very important to know the tools because it makes your job easier and fast. Tools extend the ability and help the worker in doing the job.

Skills is not the only thing needed in carpentry, we also need to follow construction company rules and regulations to avoid problems and unnecessary

expenses. By following rules and regulations, you protect the company from lawsuits. It makes a stable environment where people feel safe to come to work and to be themselves. The result is less turnover, more teamwork and higher company morale.



What I Can Do

Directions: Construct a regular hexagon with 5cm side length. Write your answers in your notebook.

Find out by accomplishing the Scoring Rubric honestly and sincerely. Remember it is your learning at stake!

10 points	8 points	6 points	4 points
All lines are carefully drawn with a pencil using only a compass and a straight edge. There is no freehand drawing. The construction is neat and detailed.	Most lines are carefully drawn with a pencil using only a compass and a straight edge. There is some freehand drawing. The construction could be neater and more detailed.	Some lines are drawn with a pencil using a compass and a straight edge. There is some freehand drawing. The construction could be neater and more detailed.	All lines created free-hand or incomplete.

Explore!

1. What are the benefits of environmentally sustainable work practices?
2. Why do carpenters need to be able to draw accurate drawings?



Assessment

Instructions: Choose the correct answer from the given options. Write the letter which corresponds to the correct answer and write them down in your notebook.

1. Which of the following is **NOT** under financial benefit of sustainable work practices?
 - a. Reduced energy and water usage and costs
 - b. Reduced material, waste and associated costs
 - c. Reduced liability and risk management
 - d. Reduced materials in production of buildings.

2. What do you call the ability or capacity of something to be maintained or to sustain itself?
 - a. Economic b. Sustainability c. Reputation d. Recovery
3. It divides the angle into two angles with equal measure.
 - a. Bisecting a straight line c. bisecting an angle
 - b. Regular hexagon d. bisecting a circle
4. What tool is used in making arcs and circles?
 - a. Ruler b. triangle c. pencil d. compass
5. _____ in geometry means to draw shapes, angles or lines accurately.
 - a. Construction b. drawing c. bisect d. compass
6. What is the first step in constructing a regular hexagon?
 - a. Draw an angle
 - b. Draw a circle
 - c. Draw a line segment
 - d. Draw an arc
7. Which of the following is under reputation?
 - a. Increase productivity c. improved working conditions
 - b. Increase marketability d. Position to influence supply chain
8. Which of the following benefits is under environmental?
 - a. Reduced material, waste and associated costs
 - b. Improved working conditions
 - c. Improved competitiveness and market positioning
 - d. Reduction in carbon footprint
9. What kind of pencil is used in geometrical construction?
 - a. 1H b. 2H c. 3H d. 4H
10. What is the minimum radius requirement of protractor to make up the basic set of geometrical instrument?
 - a. 10 cm b. 8 cm c. 5 cm d. 3 cm



Additional Activities

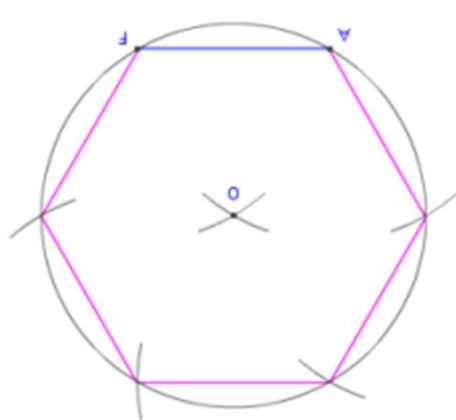
Directions: Identify the following benefits of environment sustainable work practices. Write your answers in your activity notebook.

1. Improved competitiveness and market positioning
2. Improved business social responsibility performance
3. Position to influence supply chain.
4. Reduced energy and water usage and costs
5. Improved working conditions



Answer Key

What's In	What I Know	What I Can Do
1. C	1. F	
2. A	2. H	
3. B	3. I	
4. B	4. G	
5. D	5. J	
	6. C	
	7. D	
	8. B	
	9. E	
	10. A	
		Explore
		1. The benefits of environmental sustainable work practices are Financial benefit, Employee Engagement, Reputation and Environmental
		2. Carpenters need to be able to draw accurate drawings for them to have accurate plans before they move onto a site to begin construction.
		Assessment
		1. C
		2. A
		3. B
		4. B
		5. D
		6. C
		7. B
		8. D
		9. A
		10. A



What's More	
1. line segment	1. Reputation
2. compass	2. Reputation
3. two	3. Environmental
4. circle	4. Financial benefit
5. six vertices	5. Employee Engagement
6. across	
7. vertex	
8. Move	
9. draw	
10. pairs	
Assessment	
1. C	1. Reputation
2. B	2. Reputation
3. C	3. Environmental
4. D	4. Financial benefit
5. A	5. Employee Engagement
6. C	
7. B	
8. D	
9. B	
10. C	
Additional Activities	

References

References for Content:

- <https://irp-cdn.multiscreensite.com/2909d05a/files/uploaded/VU20982.pdf>
- https://misshannahsclassroom.weebly.com/uploads/1/6/3/0/16300210/ppt_module_2_geometric_construction.pdf
- http://amsi.org.au/teacher_modules/Construction.html?COLLCC=636843675

References for Pictures:

ENVIRONMENTAL SUSTAINABILITY IN CARPENTRY,
<https://irp-cdn.multiscreensite.com/2909d05a/files/uploaded/VU20982.pdf>

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https://misshannahsclassroom.weebly.com/uploads/1/6/3/0/16300210/ppt_module_2_geometric_construction.pdf

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