

**Department of Education**  
**SPTVE**  
**TECHNICAL DRAFTING-8**  
**Interpret Technical Drawings & Plans**  
**Quarter 2 - Week 3 Module**



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## EXPECTATIONS

**At the end of the module, the learner is expected to:**

1. discuss the principles of orthographic projection;
2. perform the steps in sketching orthographic projection drawings; and
3. value the importance of this activity in interpreting technical drawings and plans.



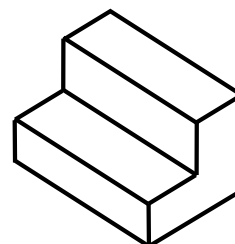
## PRE-TEST

**I. TRUE OR FALSE: Write TRUE if the statement is correct, otherwise FALSE.**

- \_\_\_\_\_ 1. The top view is directly above the side view.
- \_\_\_\_\_ 2. The side views are horizontally in line with the top view.
- \_\_\_\_\_ 3. The width of the top view is equal to the width of the side views.
- \_\_\_\_\_ 4. When a surface is viewed perpendicularly to a plane of projection, it appears as a point.
- \_\_\_\_\_ 5. A line or edge parallel to the plane of projection will also appear as a line or edge in its exact or true length.
- \_\_\_\_\_ 6. A line or edge inclined to the plane of projection will appear shorter or foreshortened.
- \_\_\_\_\_ 7. A surface perpendicular to the projection plane will appear as a line or edge equal in length to the nearest edge of the surface, which in this case is either its length or its width, depending on its position.
- \_\_\_\_\_ 8. A surface parallel to the plane of projection will be shown in its exact or true shape and size.
- \_\_\_\_\_ 9. A surface inclined to the plane of projection will also appear as a surface in exact size and shape.
- \_\_\_\_\_ 10. A line or edge of the object can be projected longer than its true length in orthographic projection.

## II. Blueprint Reading (5 points)

**Direction:** Sketch the orthographic views of the given isometric drawing below.



**ISOMETRIC**



## LOOKING BACK

Direction: Encircle the letter of the correct answer.

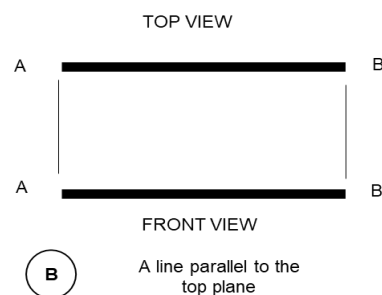
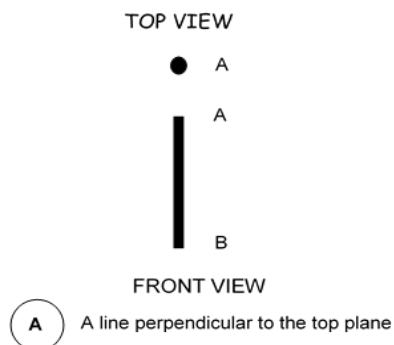
1. This is the view that shows most of the object.  
A. end view      B. front view      C. plain view      D. side view
2. It is the view looking from above.  
A. end view      B. front view      C. side view      D. top view
3. An orthographic drawing shows \_\_\_\_\_ representations of an object.  
A. One-dimensional      C. Three-dimensional  
B. Two-dimensional      D. Four-dimensional
4. A projection at this plane is called the side view or end view, or side or end elevation.  
A. frontal plane      C. profile plane  
B. horizontal plane      D. vertical plane
5. The projection shown in this plane is called top view or plan view.  
A. frontal plane      C. inclined plane  
B. horizontal plane      D. profile plane
6. Which of the following statements is correct?  
A. Orthographic drawings show more detail than 3-D drawings.  
B. Orthographic drawings can only be done by computer software.  
C. Orthographic drawings are not drawn in proportion to the object.  
D. Orthographic drawings are less detail than 3-D because they are in 2-D.
7. The projection shown in the frontal plane is called front view or front elevation.  
A. horizontal plane      C. profile plane  
B. inclined plane      D. vertical plane
8. Which style shows images projected on the *opposite* side of the observer?  
A. first-angle      B. second-angle      C. third-angle      D. fourth-angle
9. The views of the object are projected to the rear and onto the projection plane instead of being projected forward.  
A. first-angle      B. second-angle      C. third-angle      D. fourth-angle
10. The following are common methods of transferring depth dimensions EXCEPT one.  
A. using  $30^\circ \times 60^\circ \times 90^\circ$       C. using divider  
B. using  $45^\circ \times 45^\circ \times 90^\circ$       D. using scale
11. The top view is \_\_\_\_\_ aligned with the front view.  
A. diagonally      B. horizontally      C. inclined      D. vertically
12. This projection is more popular in America and Asian countries.  
A. first-angle      B. second-angle      C. third-angle      D. fourth-angle
13. The projection plane on this angle is considered to be between the viewer and the object, and the views are projected forward to that plane.  
A. first-angle      B. second-angle      C. third-angle      D. fourth-angle
14. In this projection, the top view appears above the front view, the right-side view is to the right of the front view, the left view to the left of the front view, and so on.  
A. first-angle      B. second-angle      C. third-angle      D. fourth-angle
15. The projection plane on this angle is on the far side of the object.  
A. first-angle      B. second-angle      C. third-angle      D. fourth-angle



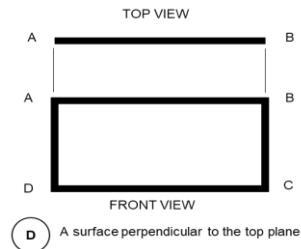
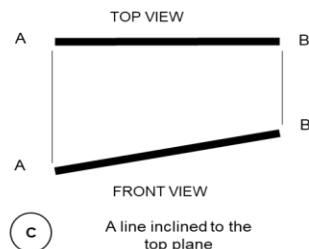
## BRIEF INTRODUCTION

### Principles of Orthographic Projection

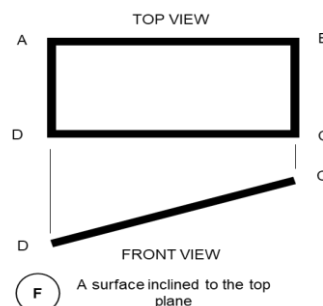
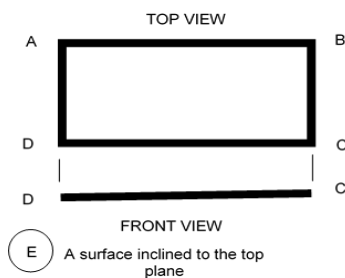
1. The top view is directly above the front view.
2. The side views are horizontally in line with the front view.
3. The width of the top view is equal to the width of the side views
4. When a line or edge is viewed perpendicularly to a plane of projection, it appears as a point. See figure A.
5. A line or edge parallel to the plane of projection will also appear as a line or edge in its exact or true length. See figure B.



6. A line or edge inclined to the plane of projection will appear shorter or foreshortened. See figure C.
7. A surface perpendicular to the projection plane will appear as a line or edge equal in length to the nearest edge of the surface, which in this case is either its length or its width, depending on its position. See figure D.



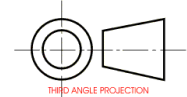
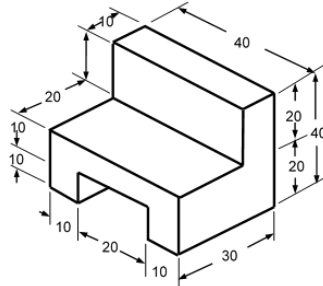
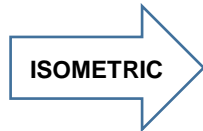
8. A surface parallel to the plane of projection will be shown in its exact or true shape and size. See figure E.
9. A surface inclined to the plane of projection will also appear as a surface but smaller in size and shape. See figure F.



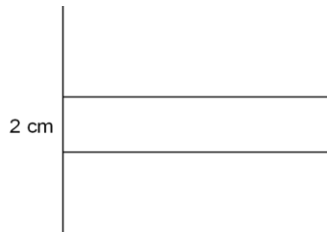
10. No line or edge of the object can be projected longer than its true length.

## Procedure in constructing orthographic projection

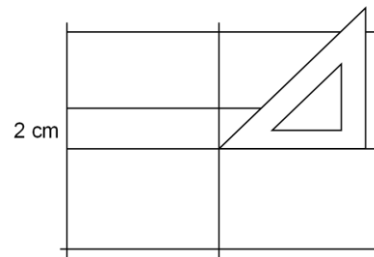
To draw orthographic views of the given pictorial drawing, first determine the number of views needed, then decide which surface will become the front view. Establish the space needed between views for dimensioning and calculate the center of the drawing. Then proceed to the following steps.



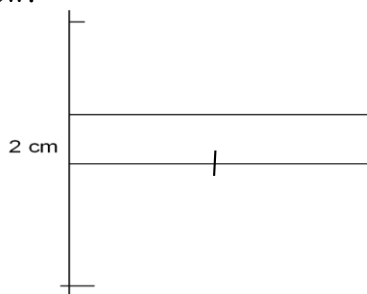
1. Draw the vertical and two horizontal axes with at least 2cm or more apart.



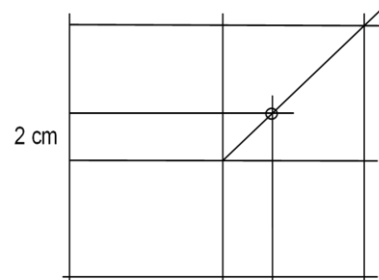
4. Construct diagonal line at  $45^\circ$  angle using  $45^\circ \times 45^\circ$  triangle from the upper right corner of the enclosing box of the front view.



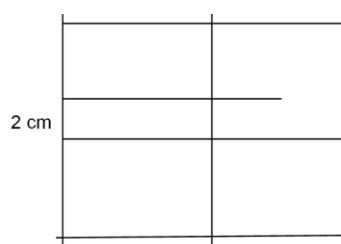
2. Indicate or supply marking lines according to the given dimension of the width of the top view, height of the front and depth of the top view.



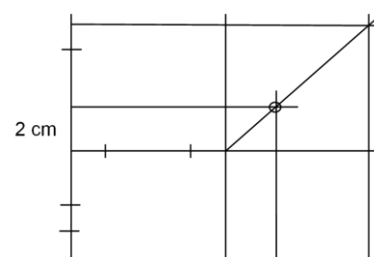
5. Project down the two intersecting points to get the width of the right-side view and to form its enclosing box.



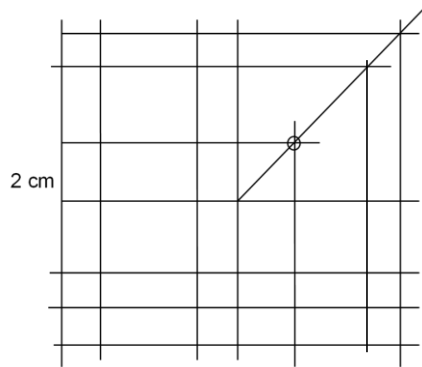
3. Construct the enclosing box of the top view and front view by projecting the marking lines horizontally and vertically.



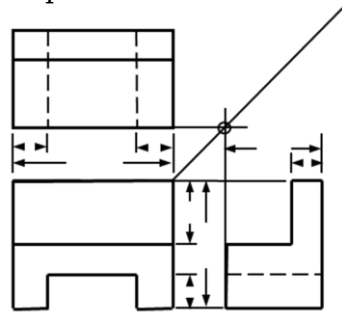
6. Divide proportioning distance of top view and front view by indicating marking lines.



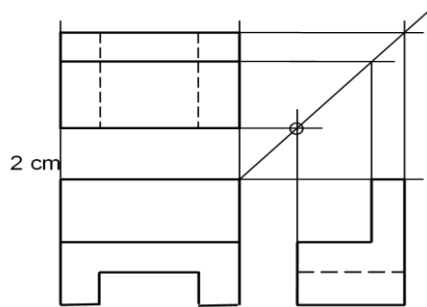
7. Draw the details of top view, front view, and right-side view by projecting the marking lines horizontally and vertically.



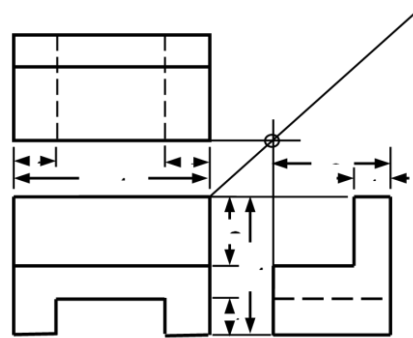
10. Draw the line for dimension and extension lines by projecting the marking lines horizontally and vertically, and supply arrows on the tip end of dimension lines.



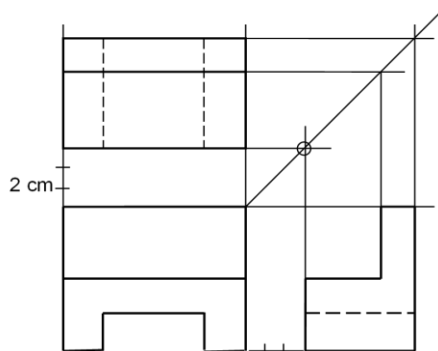
8. Darken the final edges of the top view, front view, and right-side view.



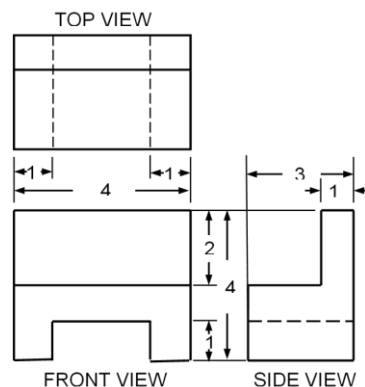
11. Indicate both detail and overall numerical dimension.



9. Divide the space provided for dimensioning by indicating marking lines.



12. Label the top, front and right-side views, finally erase the construction lines.





## ACTIVITIES

**Activity 1:** Sketch on the grid of the orthographic view with the given isometric drawing of each item below.

<p><b>1</b></p> <p>TOP VIEW</p> <p>FRONT VIEW</p> <p>SIDE VIEW</p>	<p><b>2</b></p> <p>TOP VIEW</p> <p>FRONT VIEW</p> <p>SIDE VIEW</p>	<p><b>3</b></p> <p>TOP VIEW</p> <p>FRONT VIEW</p> <p>SIDE VIEW</p>	<p><b>4</b></p> <p>TOP VIEW</p> <p>FRONT VIEW</p> <p>SIDE VIEW</p>
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## Activity 2:

Blueprint Reading. Complete the table by matching the orthographic views with the given isometric drawings below. Write the corresponding number on the space provided in the table.

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

## Activity 3. Reflection Writing

In your own opinion, write briefly the importance of orthographic and isometric drawings in interpreting the technical drawings and plans.

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## REMEMBER

### Principles of Orthographic Projection

1. The top view is directly above the front view.
2. The side views are horizontally in line with the front view.
3. The width of the top view is equal to the width of the side views
4. When a line or edge is viewed perpendicularly to a plane of projection, it appears as a point.
5. A line or edge parallel to the plane of projection will also appear as a line or edge in its exact or true length.
6. A line or edge inclined to the plane of projection will appear shorter or foreshortened.
7. A surface perpendicular to the projection plane will appear as a line or edge equal in length to the nearest edge of the surface, which in this case is either its length or its width, depending on its position.
8. A surface parallel to the plane of projection will be shown in its exact or true shape and size.
9. A surface inclined to the plane of projection will also appear as a surface but smaller in size and shape.
10. No line or edge of the object can be projected longer than its true length.



## CHECK YOUR UNDERSTANDING

Blueprint Reading. Complete the table by matching the orthographic views with the given isometric drawings below. Write the corresponding number on the space provided in the table.

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





## POST TEST

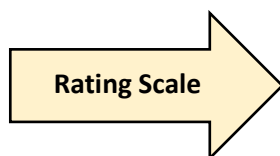
**Direction.** Sketch the orthographic views of the given isometric drawing in each item below.

1

2

### SCORING RUBRICS FOR LEARNER'S OUTPUT

	10	9	8
<b>Accuracy</b>	The output is accurately done	Two to five errors are observed on the output	Six to ten errors are observed on the output
<b>Speed</b>	2 The output is done 5 minutes before the time	1.6 The output is done on time	1.2 The output is done after the allotted time
<b>Neatness</b>	5 Has no erasure	4 Has two to three erasures	3 Has four or more erasures
<b>Notes &amp; Lettering</b>	3 All pieces of info. are completely indicated and legibly printed.	2.4 All pieces of info. are legibly printed but some are missing.	2 All pieces of info. are legibly printed but some are missing and misspelled.



Points Earned	Numerical Equivalent	Description
18 - 20	91 - 100	Excellent
15 - 17	86 - 90	Very Good
10 - 14	81 - 85	Good
Below 10 points	75 - 80	Needs Improvement

## References:

- Giesecke, Mitchell and Spencer. Technical Drawing; The Macmillan Company: 1999.
- French and Vierck. Engineering Drawing 10<sup>th</sup> edition MacGraw, Hill Book Company, 1960
- German M. Manaois. Drafting 1 and 2 Phoenix Publishing:1983
- Norman Stirling. Introduction to Technical Drawing Delmar Publishing: 1977
- Competency Based Learning Material, Technical Drafting
- Madsen, Shumaker, Turpin, Stark: Engineering, Drawing and Design
- Downloaded (Internet): Pinterest

<p><b>Check Your Understanding</b> Blueprint Reading</p> <p>1. E 2. H 3. F 4. A 5. K 6. I 7. B 8. J 9. G 10. D</p> <p><b>Post test</b></p> <p><b>ORTHOGRAPHIC</b> FRONT VIEW SIDE VIEW TOP VIEW</p>	<p><b>Activity 1</b></p> <p><b>Activity 2</b></p> <p>1. E 2. D 3. I 4. G 5. H 6. F 7. J 8. A 9. C 10. B</p>	<p><b>Key to Correction</b></p> <p>Pre test 1. False 2. False 3. True 4. False 5. True 6. True 7. True 8. True 9. False 10. False</p> <p><b>Looking Back</b></p> <p>1. B 2. D 3. B 4. C 5. B 6. A 7. C 8. A 9. A 10. A 11. D 12. C 13. C 14. C 15. A</p>
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