

Name _____

STUDY QUESTIONS FOR STEP 4

1. List three (3) uses for freehand sketches:

Sketching is a **freehand** drawing **process** that allows detailers, designers, engineers, architects, technicians and trades persons to record their ideas quickly on paper without the use of tools. Once they have recorded their ideas, they can revise and refine their sketches for presentation to their supervisors or clients. Sketching is also helpful in preliminary planning of a drawing or layout before using tools.

2. What does a "multiview sketch" show you about an object?

A **multiview two dimensional (2D) sketch** shows the actual shape of an object from different directions that are 90° apart. A typical multiview sketch will include views from the top, front and right side. The back, bottom and left side views are optional depending on the complexity of the objects shape. See Multiview Sketching Steps.

3. List the three (3) principle views that are shown on a multiview sketch:

Top, Front. and Right

4. List in your own words the steps to follow in the making of a multiview sketch:

Step 1 - ANALYZE THE OBJECT. Choose the orientation. The front view is typically the view with the most detail. Study the object to determine the number of views (one, two, three or more) and the types of views (top, front, right or left side view). Determine the size (1/4" or 1/8") to represent a unit of measurement (1/4", 1/2" or 1") and the type of paper (plain white or vellum).
Step 2 - LAYOUT THE VIEWS. Begin at the lower left area of the sheet and place four dots or dashes vertically to represent the height and width of the object with about 1" of space between the measurements. Next, return to the lower left area of the sheet and place four dots or dashes horizontally to represent the length and width of the object with about 1" of space between the measurements. If the views do not fit on a larger sheet of paper (11" x 17" or 17" x 22") or reduce the proportions of the views.
Step 3 - BLOCK IN THE VIEWS. Sketch very light construction lines horizontally and vertically at the dots or dashes to establish the outline of the object. The upper right outline is helpful in projecting lines from the top view to the right side view.
Step 4 - LOCATE DETAILS. Use very light construction lines to locate changes in the shape of the object and to show the location of holes and fillets. Extend the construction lines into the adjacent view (top to front, front to side and top to side).
Step 5 - ADD DETAILS. Use very light construction lines to create a box that represents the diameter of holes or the radius of rounded corners and rounded corners using 90° arcs.
Step 6 - DARKEN VISIBLE LINES. All lines that represent visible edges of the object should be shown as solid thick lines.
Step 7 - DARKEN HIDDEN LINES. All lines that represent interior edges or hollow portions of the object should be shown as dashed medium weight lines.
Step 8 - ADD CENTER LINES. All lines that represent the center of holes or the center of rounded corners should be shown as thin dashed lines.

Use thin long and short dashed lines to locate the center of holes and arcs. NOTE: Construction lines DO should be drawn very lightly.

5. What does a "pictorial sketch" show you about an object?

A **pictorial three dimensional (3D) sketch** shows the overall shape of an object from one direction. There are three types of pictorial sketches: isometric, oblique and perspective. The isometric is the easiest to create as actual measurements are used and the shape of arcs and circles is consistent on all surfaces. The cabinet oblique sketch is best used for furniture or cylindrical shaped objects as a normal front view is used. Perspective sketches provide the most realistic view of an object but are more difficult to create as all distances must be shortened

6. List the three (3) principle types of pictorial sketches:

oblique, isometric, and perspective

7. Why is the "isometric pictorial sketch" the most commonly used type of pictorial view?

Isometric views are the most commonly used because they show the **true size** on each side drawn..

8. What overall shape should an object have to utilize an "oblique view"?

Oblique views are typically used when the object being drawn is a cylinder, a circular form or furniture

9. What does a "perspective sketch" show you about an object?

Perspective sketches provide the most realistic view of an object but are more difficult to create as all distances must be shortened.

10. What does a "floor plan" and an "elevation" show you about a building?

A **floor plan** sketch is similar to a top view with the roof removed and shows interior walls, windows, doors, appliances, fixtures, built-in cabinetry and stairways. An **elevation** is similar to a front view and shows the height of the structure plus exterior materials like siding, doors, windows, trim and roofing.

11. List in your own words the steps to follow in the making of a pictorial sketch:

Step 1 - ANALYZE THE OBJECT.

Study the object to determine the length, width and height. Determine the type of pictorial view (isometric proportional grid size (1/4" or 1/8")) to represent a unit of measurement (1/4", 1/2" or 1") and the type of projection.

Step 2 - LAYOUT THE AXIS FOR AN ISOMETRIC SKETCH.

Begin at a point to the right and below the center of the sheet. At this point sketch three axis (one vertical, horizontal and one to the left at a 30° angle from horizontal). The three axis should form a "Y" on the sheet.

Step 3 - ADD DIMENSIONS TO THE AXIS.

Estimate the height on the vertical axis and mark it with a dash. Estimate the width on the axis to the right the length on the axis to the left and mark it with a dash. If the measurements do not fit in the space available (8 1/2" x 17" or 17" x 22") or reduce the proportions of the views.

Step 4 - BLOCK IN THE VIEWS.

Sketch very light construction lines parallel to the axis to form a box that the object will fit in.

Step 5 - LOCATE DETAILS.

Use very light construction lines to locate changes in the shape of the object and to show the location of holes.

Step 6 - ADD DETAILS.

Use very light construction lines to create a diamond that represents the diameter of holes or the radius of holes and rounded corners using one or more arcs.

Step 7 - DARKEN VISIBLE LINES.

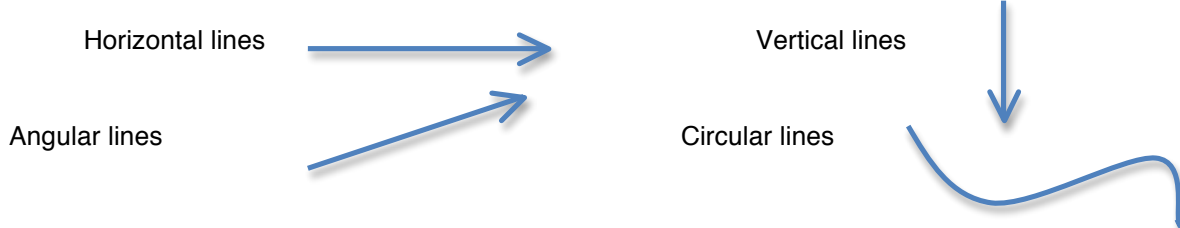
All lines that represent visible edges of the object should be shown as solid thick lines.

Step 8 - ERASE EXCESS LINES.

Hidden lines or center lines are NOT shown.

NOTE: Construction lines DO NOT need to be erased as they should be drawn very lightly.

12. Show and label with arrows the recommended methods for sketching the following lines:



13. Sketch an example of a "construction" line and explain how it is used:

Construction lines are very thin, light lines and are used to layout preliminary shapes. Construction lines should not have to be erased. See [Alphabet of Lines](#).



14. Sketch an example of a "visible" line and explain how it is used:

Visible or object lines are thick, solid lines and are used to show the outline or the visible edges of the object.

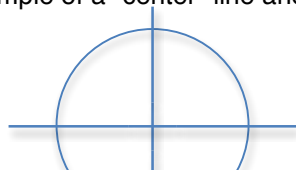


15. Sketch an example of a "hidden" line and explain how it is used:

Hidden lines are medium thick, dashed lines and are used to show edges or surfaces on the inside of an object or behind the top, front or side surfaces.



16. Sketch an example of a "center" line and explain how it is used



Center lines are thin lines composed of long and short dashes and are used to locate the center point of holes or the central axis of a cylinder.

17. Is it necessary to erase "construction" lines? Explain: Construction lines should not have to be erased because they are already light lines and are only used to layout preliminary shapes

18. What shape does a circle become when sketched on a pictorial view?

The circle becomes an ellipse.

19. Is it necessary to sketch objects in the proper "proportions"?

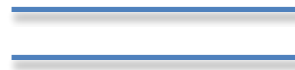
Explain: yes because the objects need to stay the same size in relation to one another.

20. Make freehand sketches of the following using appropriate "proportions" in the space below :

1" x 2" rectangle



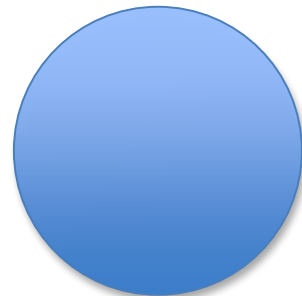
two 1.5" parallel lines 1/2" apart



two 3/4" perpendicular lines



1.5" diameter circle



2" isometric ellipse



30°, 60° & 90° triangle a 45°, 45° & 90° triangle

