

Dimensioning Orthographics

-If a drawing is to be complete so that the object represented can be made from it exactly as intended by the drafter or designer, it must tell two stories. It tells these by means of (1) *views*, which describe the shape of the object, and (2) *dimensions and notes*, giving the sizes and other shop information.

-The drawing shows the object in its completed state, and, whether the views are drawn full size or to scale; the dimensions must be the actual dimensions of the completed object.

-If the drawing is dimensioned wrong, the object will be made wrong.

Line Types used in Dimensioning

-Dimension lines should be dark thin lines; the views should stand out clearly from the dimensions.

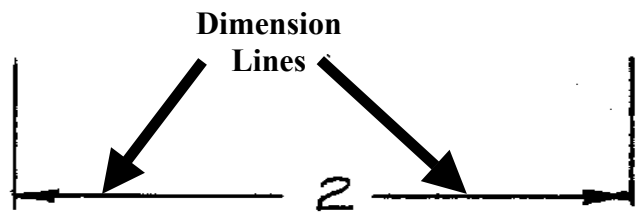
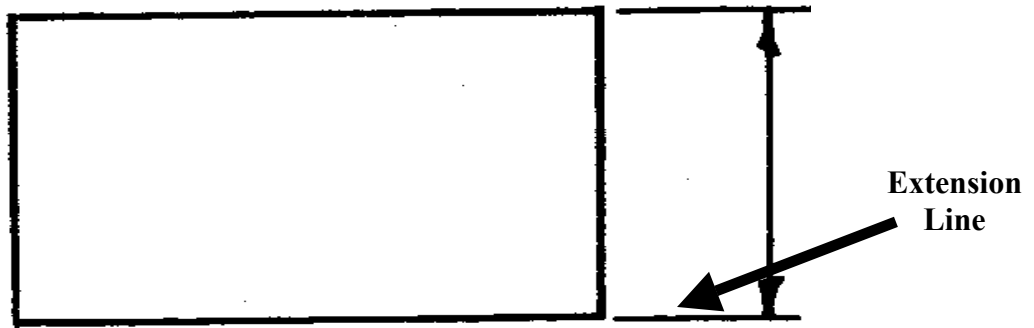
Extension Line: The extension line “extends” from the object with a gap of about 1/16” next to the object and continues to about 1/8” beyond the outermost arrowhead.

Dimension Line: A dimension line has an arrowhead at each end indicating the extent of the dimension. A gap is left near the middle for the dimension figure. On small drawings, dimension lines are spaced at least 3/8” from the object and at least 1/4” apart. The spacing must be uniform throughout the drawing.

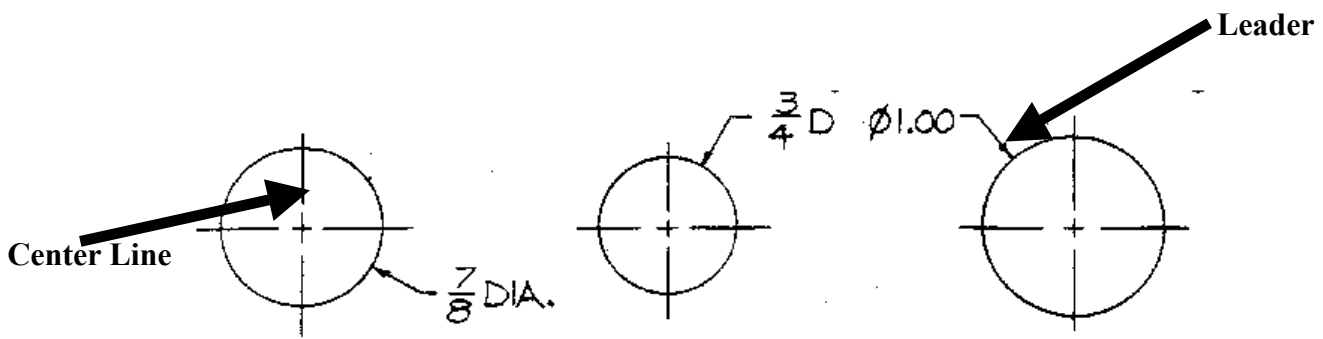
Center Line: Center lines are used to indicate axes of symmetry and in place of extension lines for locating holes and other features. Make center lines end about 1/4” outside the hole or feature.

Leader: A leader is a thin line that “leads” from a note or dimension and is terminated by an arrowhead touching the part to which attention is directed. Leaders are straight inclined lines usually drawn at 45°, 60°, or 30°. A short horizontal line extends from the inclined line.

Arrowheads Arrowheads are drawn with two sharp strokes away from the point. The length should be 1/8” and the width should be about 1/3 the length. For better appearance, they may be filled in.



- The number label is placed in the center of the dimension line.



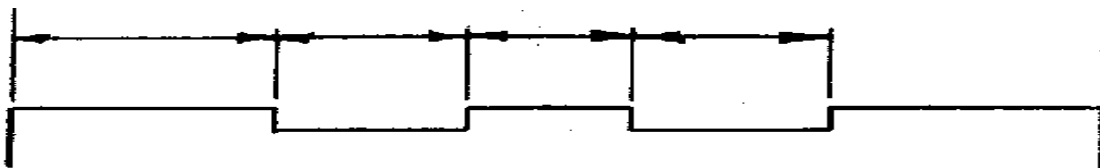
- All dimensions are completed using 1/8" letters and numbers.

Dimensioning Edges

- Incorrect or unclear dimension figures can lead to costly mistakes in the shop building the object.
- The standard height for all whole numbers is 1/8" and for fractions double this to 1/4"
- Do not dimension hidden edges or contours.
- Never letter a dimension figure over any line of the drawing.
- Do not duplicate dimensions. Repetition of dimensions clutters the drawing.
- Draw extension lines **off** the object whenever possible.
- It is common practice to omit all inch marks on a drawing when all dimensions are expressed in inches.

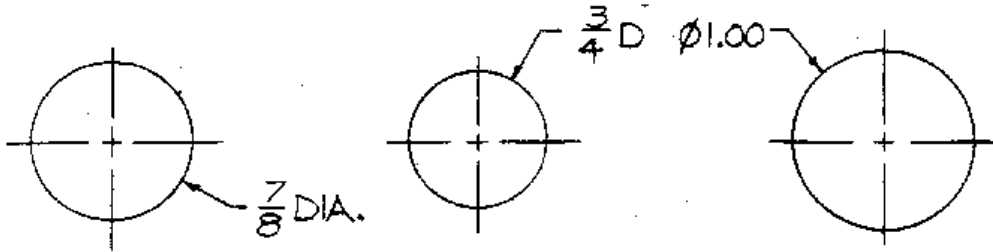


- Place multiple contour dimensions at the same point off the object.



Dimensioning Circles

- Circles or holes are labeled by listing the diameter.
- There are 3 acceptable versions for dimensioning the diameter.



- Dimensioning circles uses a **leader line**.

Dimensioning Arcs

- An arc is a portion of a circle or a curved line with a defined radius.
- Arcs are dimensioned in the views in which their true shapes appear by giving the radius. The letter R, for radius, is always lettered after the figures.
- The dimension figure and arrowhead should be inside the arc. If space is too crowded to letter the dimension inside the arc, move the figure to the outside if necessary.

Dimensioning Angles

- Angles are drawn with the triangles or with the aid of the protractor. They are indicated by degrees. Circular dimension lines are drawn using a compass with the center at the vertex of the angle.

Steps in Applying Dimensioning

- Draw extension lines dark and sharp. Extend the center lines of the hole, to be used in the same matter as extension lines.
- Use the scale to space dimensions at least $3/8''$ from the object and $1/4''$ apart. Draw the dimension lines dark and sharp.
- Draw all arrowheads about $1/8''$ long and very narrow.
- Add all dimension figures and lettering.
- The views should stand out clearly from the dimensions.