ISOMETRIC DRAWING

The term 'Isometric' means 'equal measures.' The principal edges (sides) of an object make equal angles with the plane of projection. Isometric drawings show the physical appearance of objects, so that persons who cannot understand orthographic projection can easily understand the object. When an observer looks at an isometric drawing of an object, he/she will see the length, the width, and the height/depth/thickness. In this manner the shape and size of the object can be easily understood.

Isometric drawing is different from the others because its horizontal sides are inclined at angle 30°, while the horizontal sides of oblique drawings are inclined at 45°.

Isometric drawings are different from isometric projections. Whereas an isometric drawing is drawn with an ordinary scale, an isometric projection is drawn with an isometric scale which makes the object look shorter (foreshortened) than the real size. However, the pictorial value of the object drawn remains the same.

Isometric Scale

Isometric scales are used to produce isometric projections of an object which look shorter than the isometric drawing. All distances in an isometric scale are approximately 80% of the true size. When an isometric drawing of an object is compared to the orthographic projection of the same object, the isometric drawing looks larger than the orthographic projection. To avoid this, the isometric scale is used to produce isometric projections of objects. The use of the isometric scale foreshortens the size of an object and makes it appear equal to the orthographic views.

How to Construct an Isometric Scale

1. Draw a horizontal line and label it AB.
2. At point A, draw a line AC at 30° to AB.
3. At point A, again draw a line AD at 45° to AB.

4. Beginning from point A divide the 45° line into a number of equal parts.
5. From the points on the 45° line, drop vertical lines to the 30° line.
6. The 30° line with its divisions represents the isometric scale, and the dimensions on it are isometric measures.

Isometric Angles

An isometric angle is the angle which the lateral side of an object makes with the horizontal plane. This is usually 30°. All lateral sides of isometric projections are inclined to the horizontal plane at an angle of 30°. For an object to be viewed in an isometric form, it has to be looked at from an edge. While the edge is drawn vertically, the lateral edges are drawn at angle 30°.

Making Isometric Projections

1. Draw a horizontal line.
2. At a point A on the line, draw a line AC which is perpendicular to the horizontal line.
3. On the left side of A, use the 30° set square to draw line AD. Do the same for line AB on the right side of A.
4. At point B, erect line BE and at point D erect line DG.
5. At point C, draw CE parallel to AB and CG parallel to AD.
6. Draw GF parallel to CE, and EF parallel to GC.

Uses of Isometric Drawings

1. Promote quick and easy understanding of the shape and size of an object.
2. Make quick design and construction of objects.
3. Give a more realistic impression of the form of an object than by orthographic drawings.
4. Produce catalogues, leaflets, and manuals, by artists.

- the foundation of drawings in technical studies is geometry of mathematics. Please develop quickly contents in arithmetic, algebra and begin seriously geometry.