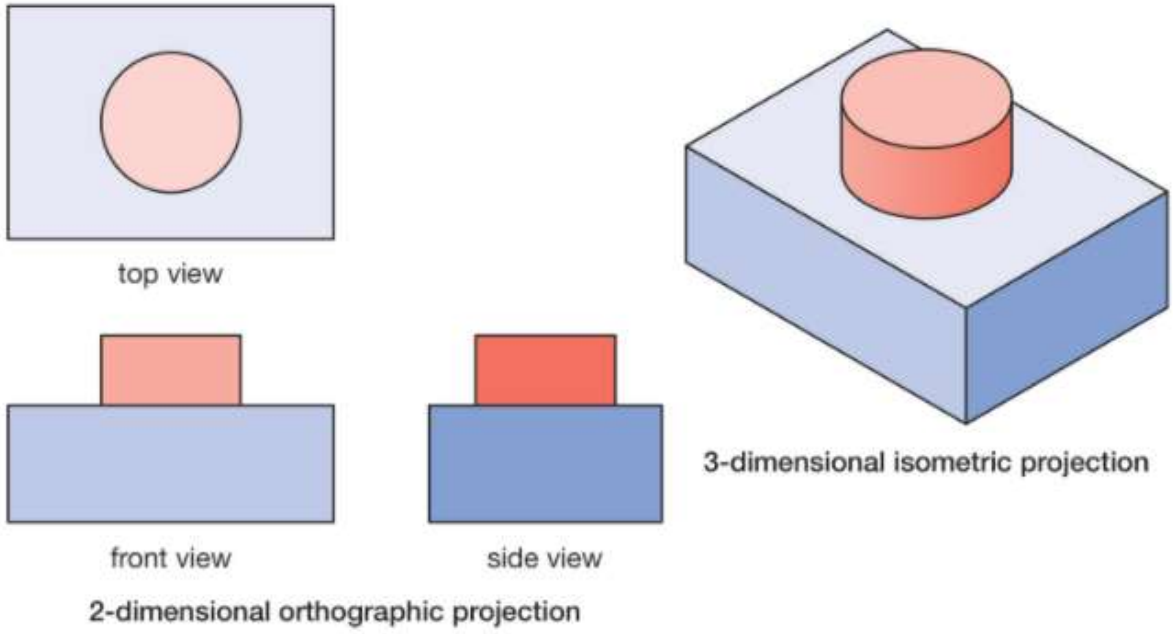
كلية آشور الجامعة
Ashur University College

DEPT. OF MEDICAL DEVICES TECHNIQUES ENGINEERING **ACADEMIC YEAR: 2021-2022**

STAGE: FIRST **SUBJECT: ENGINEERING DRAWING** **INSTRUCTOR: ASSIT. PROF. SAAD ALKHFAJI**

LECTURE 5: Orthographic Projection

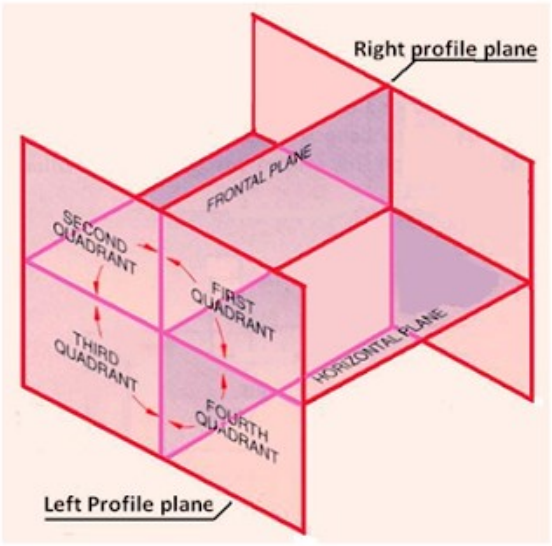
Orthographic projection (sometimes referred to as orthogonal projection) is a common method of representing three-dimensional objects, usually by three two-dimensional drawings in each of which the object is viewed along parallel lines that are perpendicular to the plane of the drawing. Orthographic drawings require the representation of 3D objects on 2D surface as shown in below.

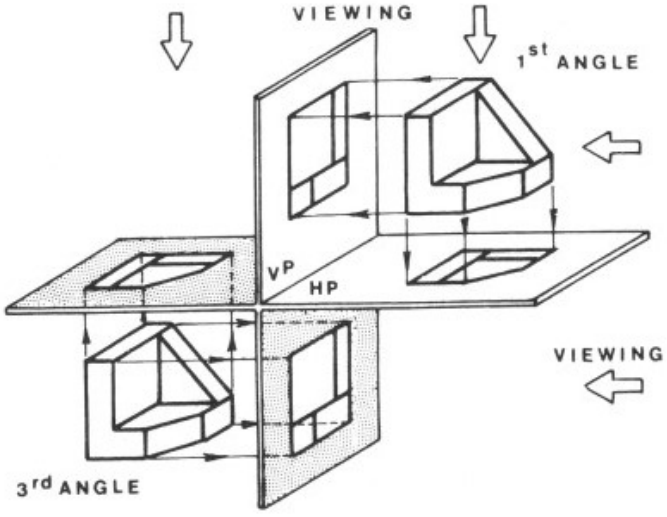


Now how do we obtain these orthographic views from a 3D object?

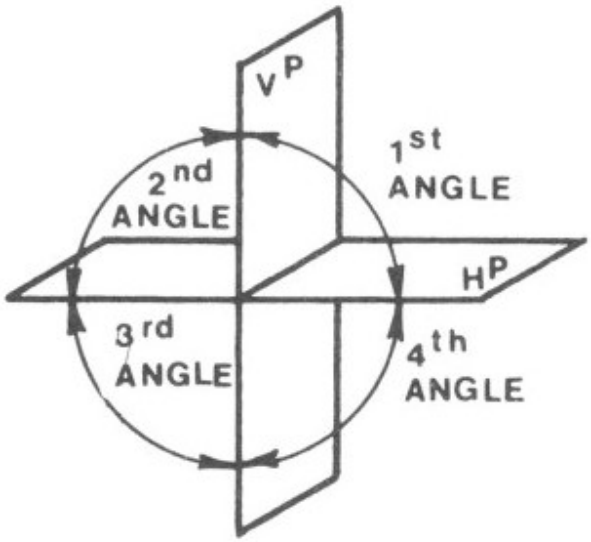
Types of projection: We essentially have two main types of projection techniques: the First angle projection, and the Third angle projection. Both of them do the same job, but there are differences in the way we get the results.

Method of Projection: Divide the plane into four quadrants. For the first angle projection, place the object in the first quadrant and in the third quadrant for the third angle projection.





The viewing angles are split into quadrants of first angle, second angle, third angle, and fourth angle, as shown in below:



In practice only first angle quadrant and the third angle quadrant are used since these are pure views. The second angle quadrant and fourth angle quadrant are combination of first and third angle projections and cause confusion to the reader.

First Angle Projection and Third Angle Projection

First angle projection and Third angle projection are two different methods of creating a 2D drawing of a 3D part. First Angle Projection is commonly used in all countries other than United States. It is mainly used in Europe and Asia countries. Third Angle Projection is commonly used in United States of America.

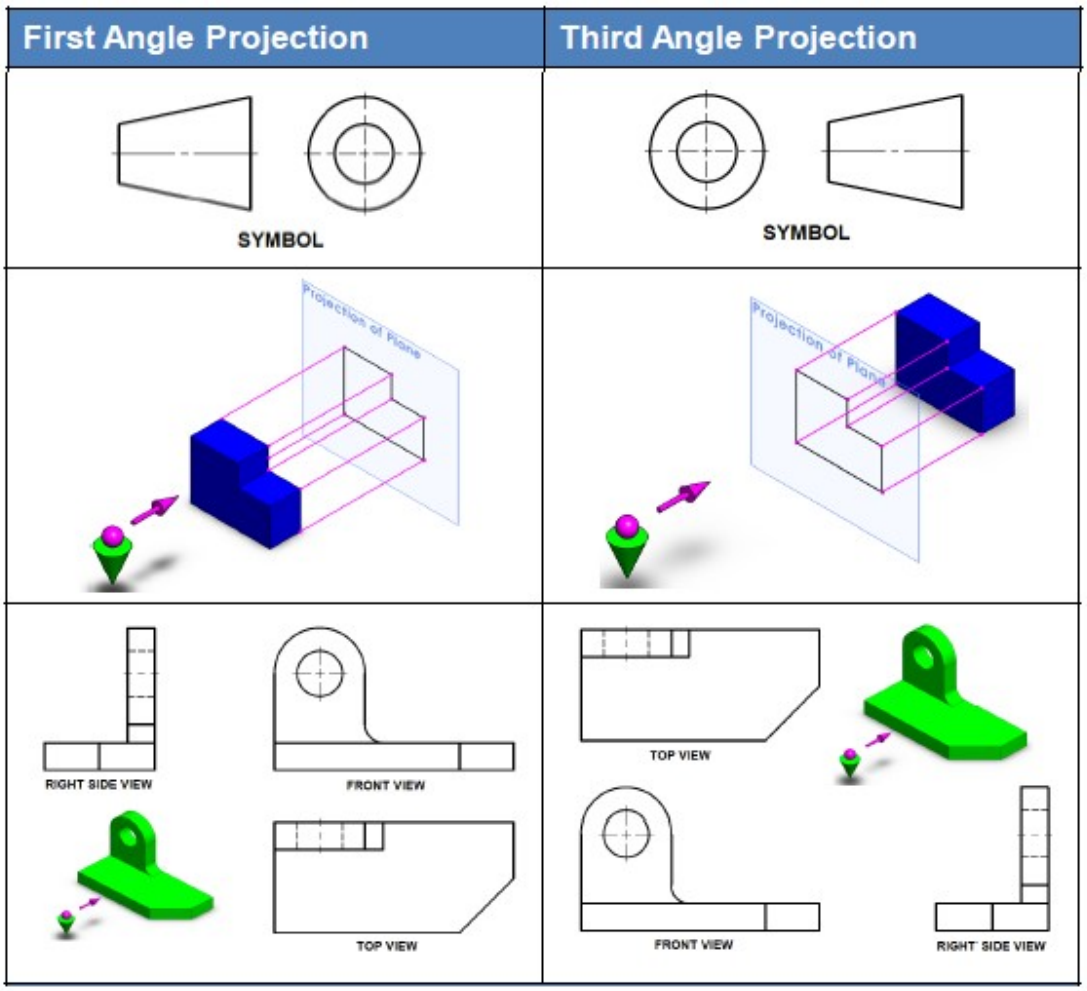
First Angle Projection:

1. The object is imagined to be in first quadrant.
2. The object is lies between the observer and plane of projection.
3. The plane of projection is assumed to be non transparent.
4. When view are drawn in their relative position Top view comes below Front view, Right side view drawn to the left side of elevation.

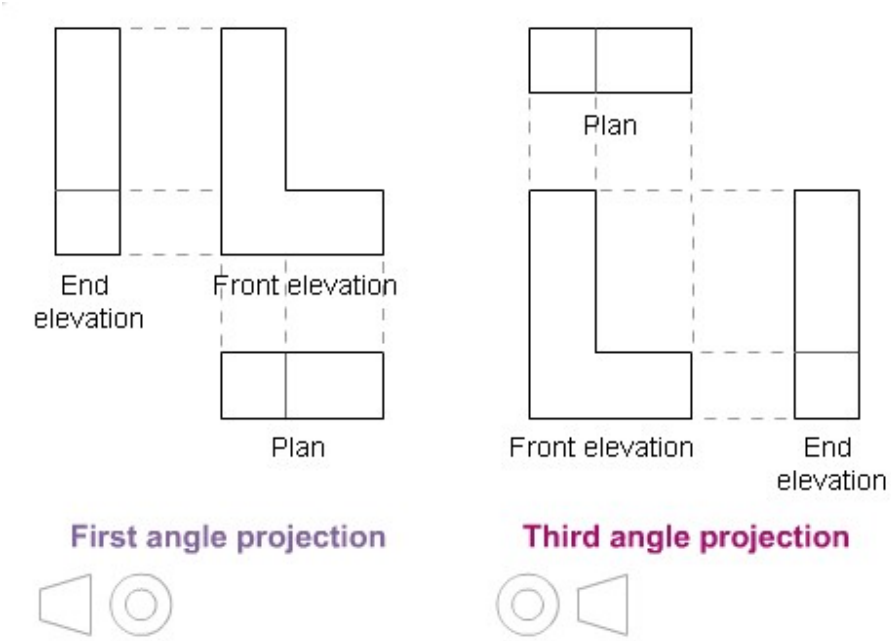
5. A First Angle Projection drawing is identified by the first angle projection symbol. The angle of projection symbol typically appears in angle of projection block near to Title block.

Third Angle Projection:

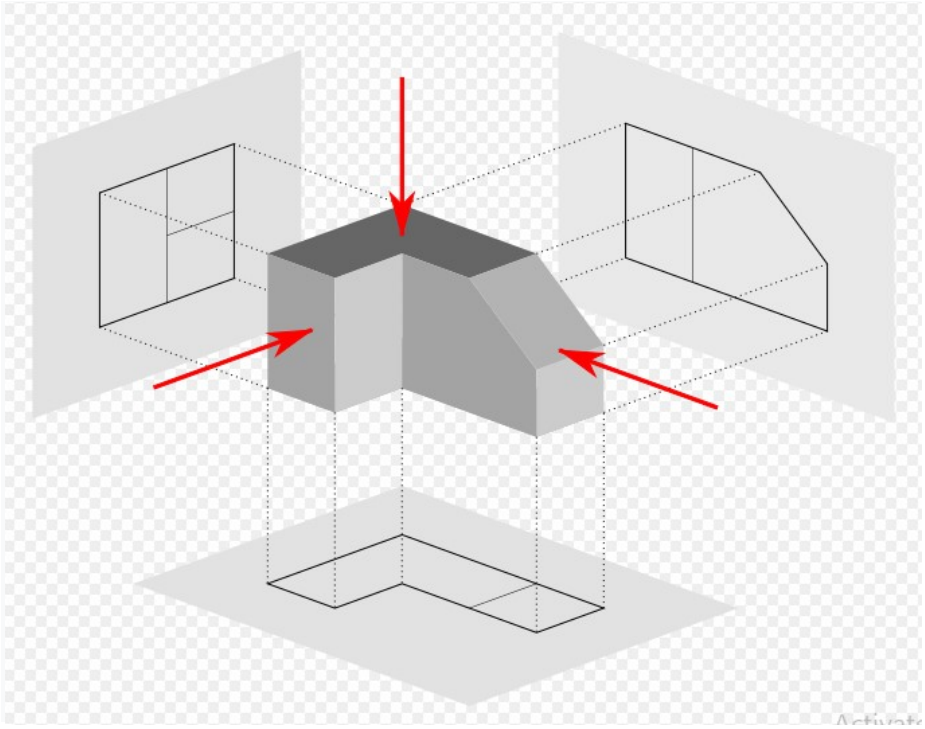
1. The object is imagined to be in third quadrant.
2. The plane of projection lies between the observer and object.
3. The plane of projection is assumed to be transparent.
4. When views are drawn in their relative position Top view comes above Front view, Right side view drawn to the light side of elevation.
5. A Third Angle Projection drawing is identified by the third angle projection symbol. The angle of projection symbol typically appears in angle of projection block near to Title block.



Third Angle Projection is the most common form of Orthographic Drawing. This type of drawing is used to communicate a design concept with manufacturers for them to produce the product accurately.



The first angle projection used in engineering drawings:

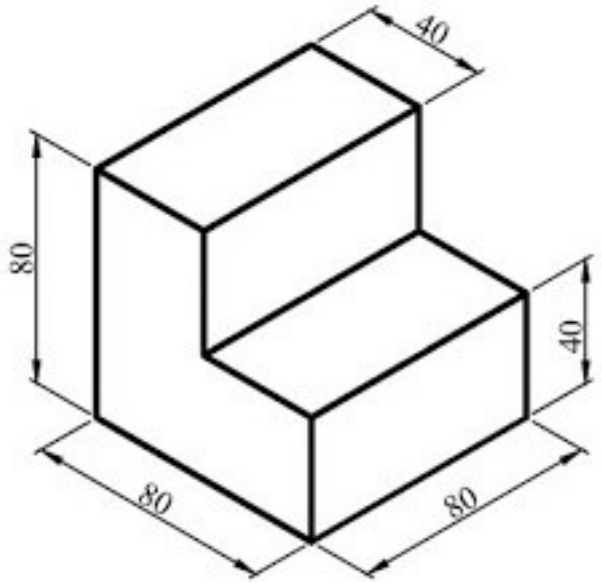


C.W.

Using First Angle Projection, draw the following views for the part shown in below:

1- **Top View**
2- **Front View**
3- **Side View**

Dimensions are shown in mm.



H.W.

Using Third Angle Projection, draw the following views for the part shown in below:

1- **Top View**
2- **Front View**
3- **Side View**

Dimensions are shown in mm.

