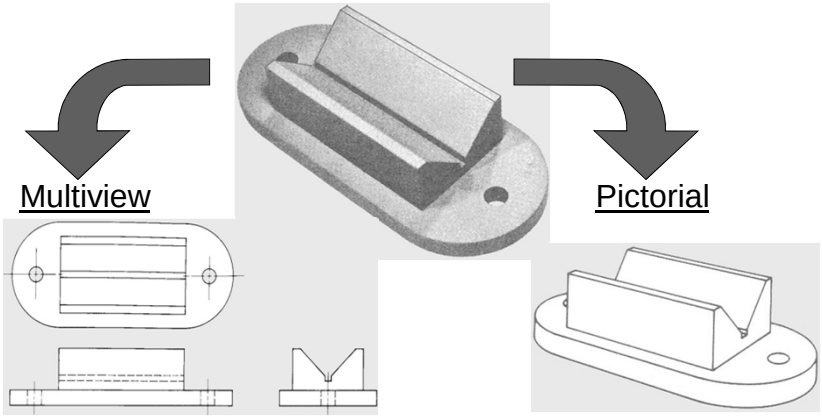
Different views of an object

- Objects may be drawn in different ways



Multiview

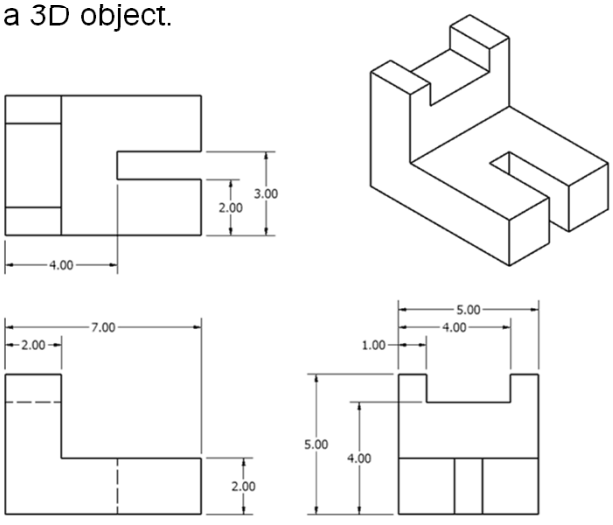
- Better for showing true size and shape
- Each view only shows two dimensions

Pictorial

- Better for visualizing the object
- All three dimensions shown on a single view

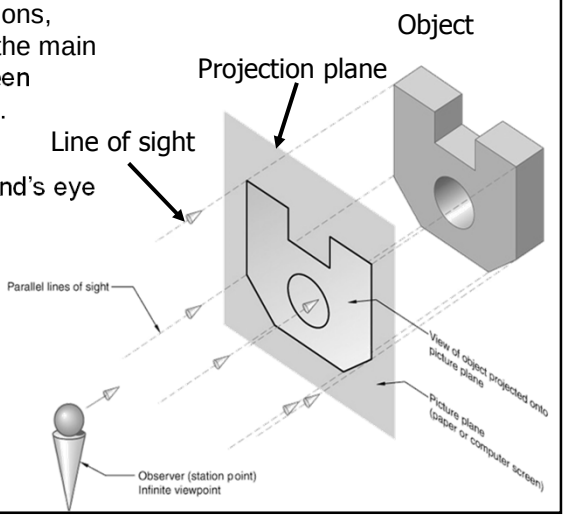
Multiview Drawing

A ***multiview drawing*** is one that shows two or more 2D views of a 3D object.

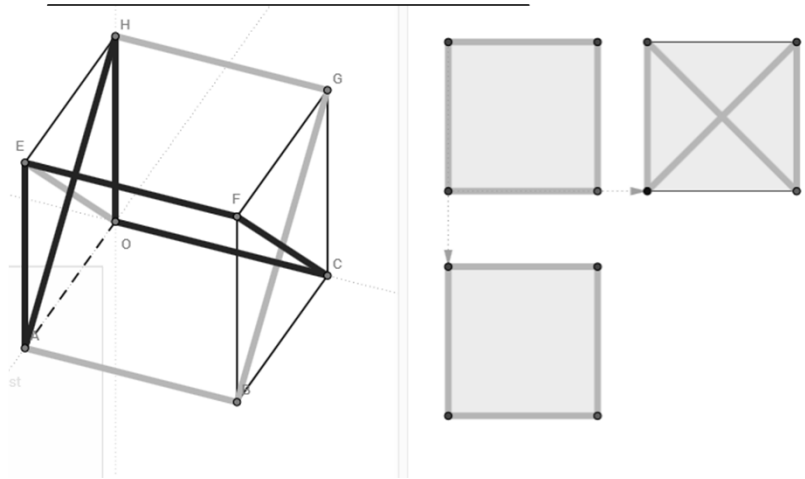


Multiview Drawing = Orthographic projection

- Multiview drawings provide the shape description of an object.
- When combined with dimensions, multiview drawings serve as the main form of communication between designers and manufacturers.
- Ability to see clearly in the mind's eye an object

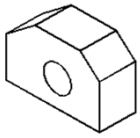


Puzzle over multiple views

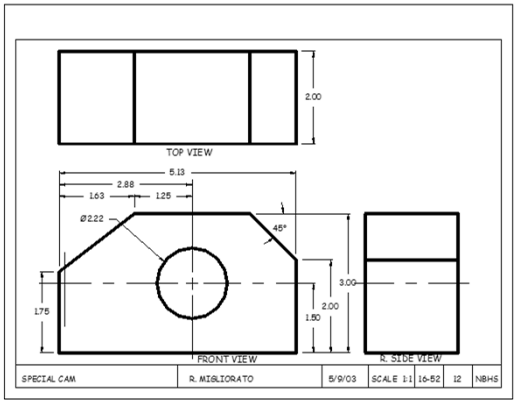


Multiview drawings serve as the documentation for manufacturers
– designers must NOT draw puzzle
– views should be visually balanced

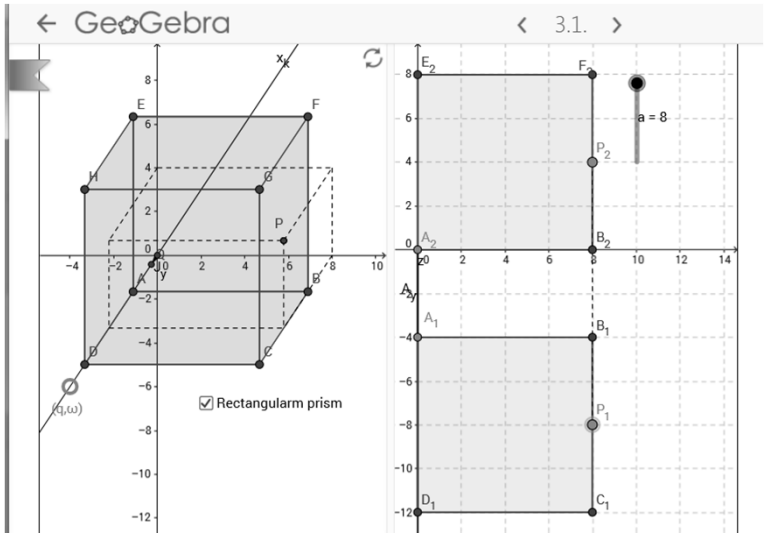
Placement of Views



Views should be visually balanced within the working space

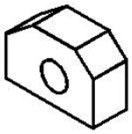


Parallel orthogonal projection onto two mutually orthogonal planes – horizontal plane π and vertical (frontal) plane ν.



https://www.geogebra.org/m/adNf29qr#material/GyhTxtJd

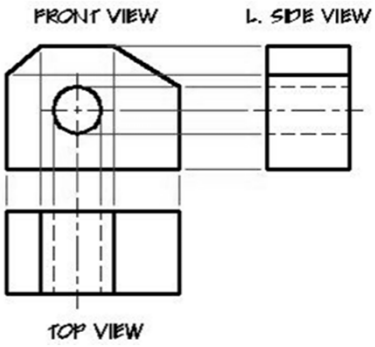
Angles of Projection



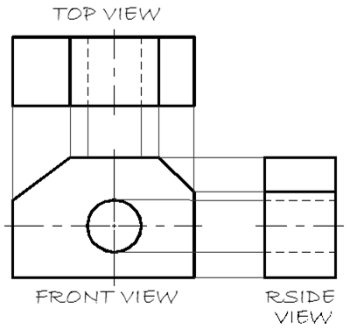
First/third-angle projection

- Used by many European countries/Standard for the United States
- Object is projected onto planes from the first/third angle or quadrant.

First angle

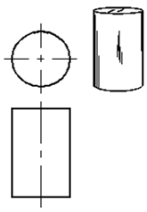


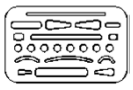
Third angle



Choosing Views

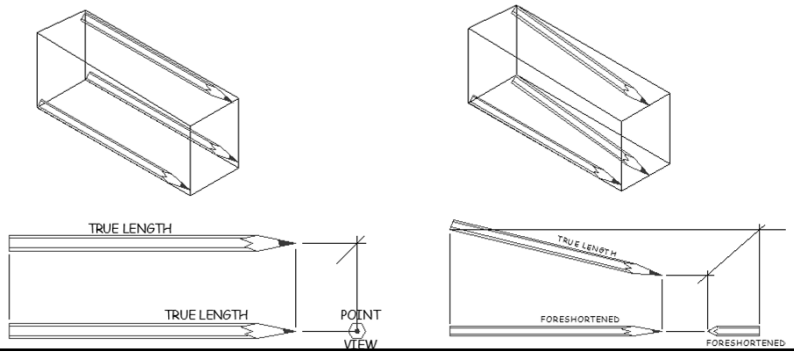
- Complex objects require three views to describe its shape
- Simple objects can be described with two views
  - Ex: Soda Can
- Thin objects can be described with only one view
  - Depth is given in a note
  - Ex: Erasing Shield





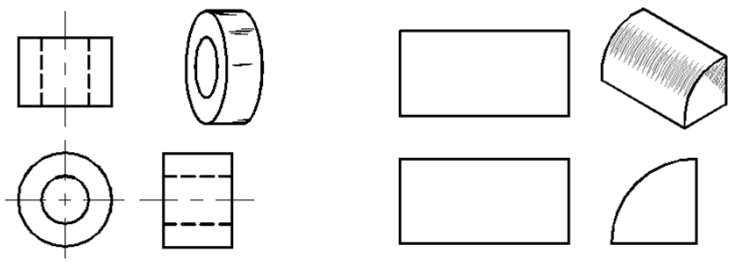
Straight Edges

- Edges that are parallel to a plane of projection appear as segment with true size.
- Edges that are inclined to a plane of projection appear as foreshortened lines



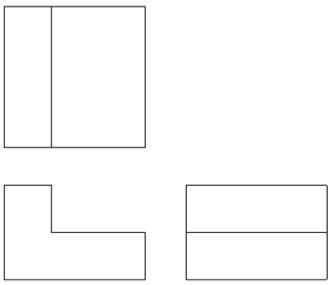
Curved Edges

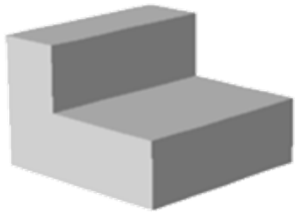
- Curved edges project as straight lines on the plane to which they are perpendicular
- Curved edges project as curved lines on the planes to which they are parallel or inclined



Normal Surfaces

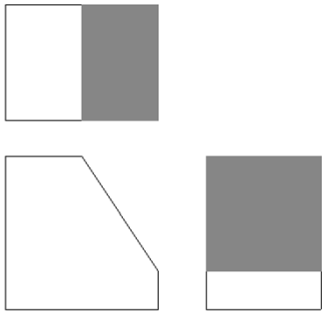
Normal surfaces appear as an edge in two opposite principal views, and appear a surface in all other principal views.





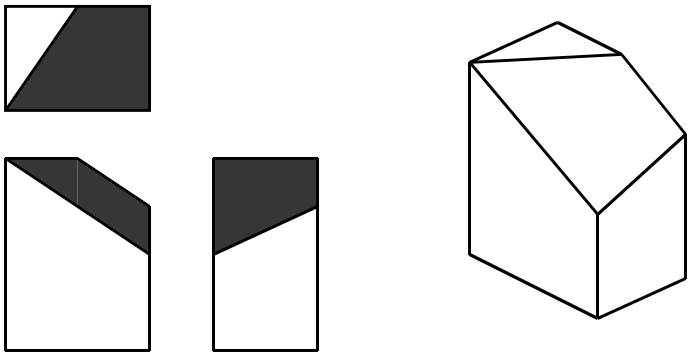
Inclined Surfaces

Inclined surfaces appear as an edge in two opposite principal views, and appear foreshortened (not true size) in all other principal views.



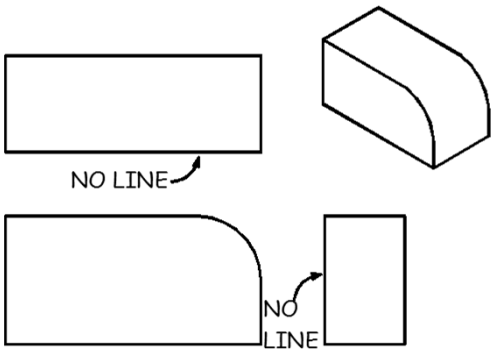
Oblique Surfaces

Oblique surfaces do not appear either as an edge or true size in any principal view.



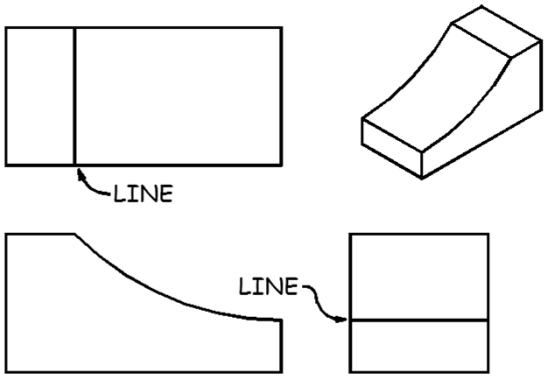
Intersections & Tangencies

Where a curved surface is *tangent* to a plane surface, no line should be shown where they join.



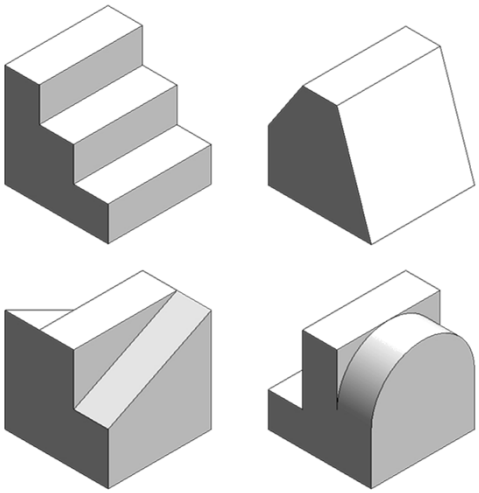
Intersections & Tangencies

Where a plane surface intersects a curved surface, an edge is formed.



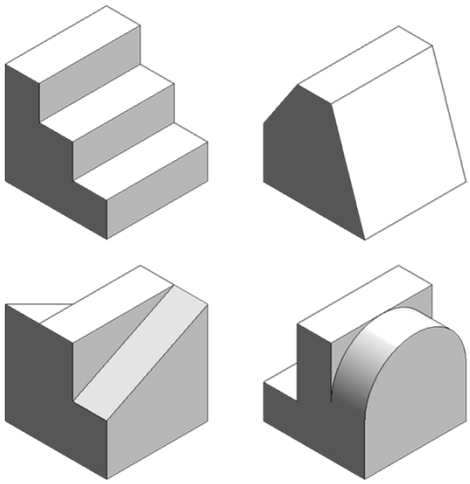
A Question…

Each of the blocks to the right have the same overall dimensions and colors.
What else to they have in common?



Answer ….

They all have identical top views!

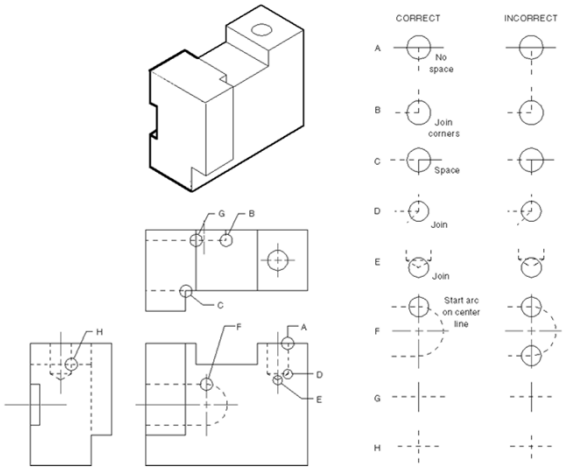


HIDDEN LINES
MUTLIVIEW DRAWINGS

We place hidden lines in a drawing to do the following things:

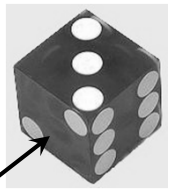
1. ***Show hidden features***
2. ***Clarify the position and shape of features***
3. ***Make the "plate" more readable***

(NOTE: The term "plate" refers to a finished drawing.)



How many views?

- Cubes (like these dice) have 6 sides



Since each side of the die will have its own view… then there must be **SIX** possible orthographic views!

Front

How many views?

- Cubes (like these dice) have 6 sides

Since each side of the die will have its own view… then there must be **SIX** possible orthographic views!

Front

Top

How many views?

- Cubes (like these dice) have 6 sides

Since each side of the die will have its own view… then there must be **SIX** possible orthographic views!

Front	**Back**
Top	**Bottom**
Right Side	**Left Side**

The **Front**, **Top**, and **Right Side** are the views that are usually drawn.

Where do the views go?

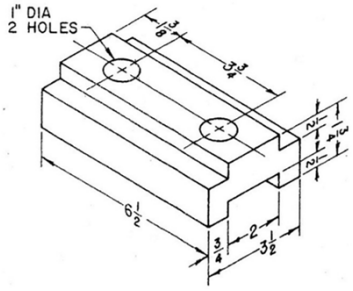
- All the views MUST be arranged correctly

Imagine “unfolding” the cube to get proper view alignment.

The back view can be placed in any of these four locations.

Layout of the 6 Views

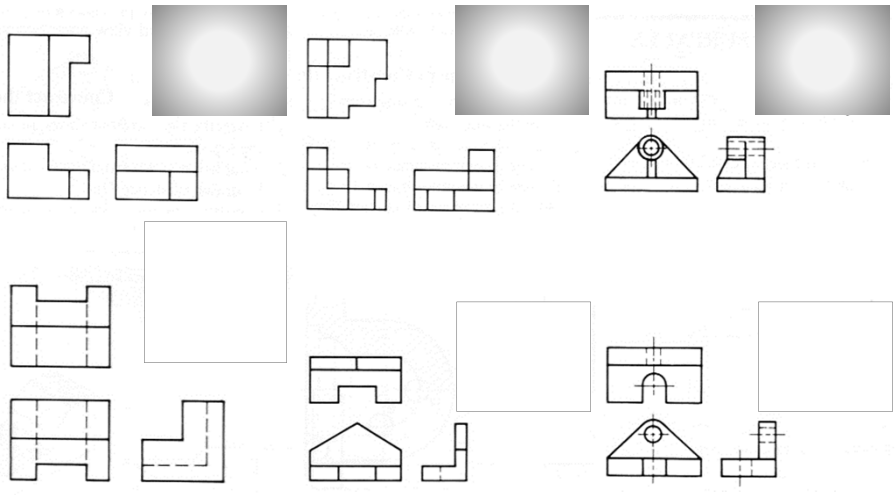
Sketch the layout of the 6 views of this object and label the views.



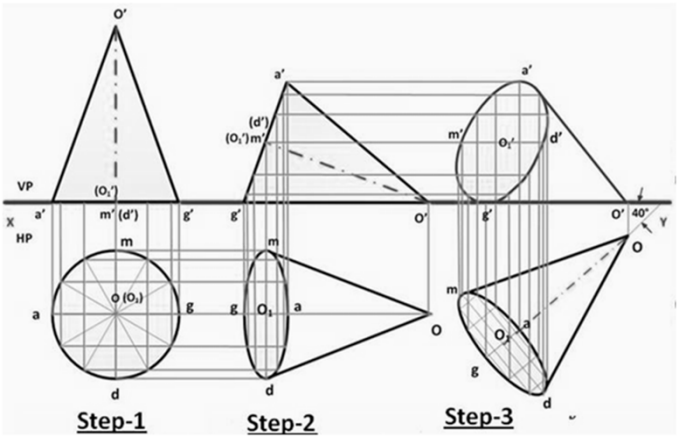
TOP

REAR | L. SIDE | FRONT | R. SIDE

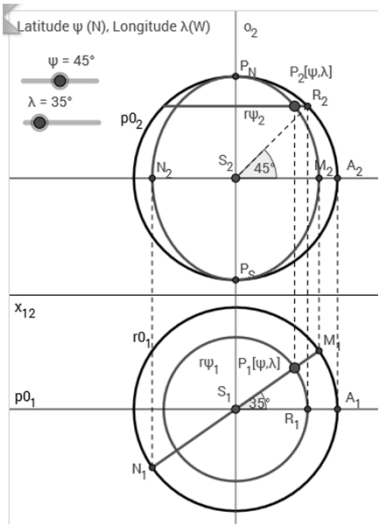
BOTTOM



http://www.millwood.ednet.ns.ca/tech/ext10/drafting/multi/



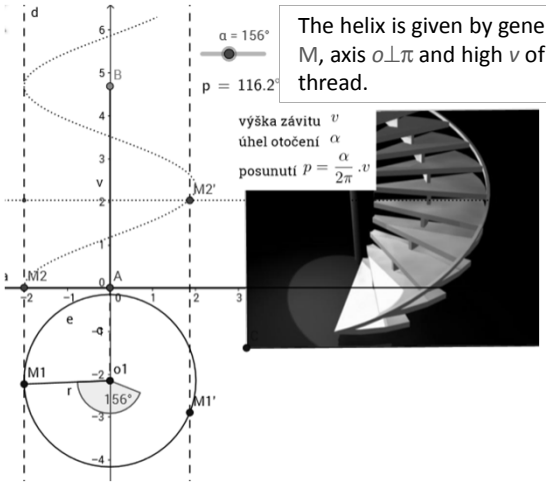
The Globe



- A **geographic coordinate system** enables every location on the Earth to be specified by latitude, longitude and elevation.
- The "latitude" of a point on the Earth's surface is the angle between the equatorial plane and the straight line that passes through that point and through the center of the Earth.
- Lines joining points of the same latitude trace circles on the surface of the Earth called parallels, as they are parallel to the equator and to each other.
- The "longitude" λ of a point on the Earth's surface is the angle east or west from a reference meridian to another meridian that passes through that point.

https://www.geogebra.org/m/adNf29qr#material/SGYnT9Ke

Helix – trajectory in the screw motion



The helix is given by generating point M, axis $o \perp \pi$ and high v of one screw thread.

https://www.geogebra.org/m/adNf29qr#material/ePbnZDAZ

Helix – trajectory in the screw motion

The helix is given by generating point M, axis $o \perp \pi$ and high v of one screw thread.