

Multi-View Sketching

O'Keefe - LBHS

- Shows two or more two-dimensional views of a three-dimensional object.
- Provides the shape description of an object.
- When combined with dimensions, serves as the main form of communication between designers and manufacturers.

Example of Multi-view Sketch





All three-dimensional objects have *width*, *height*, and *depth*.

- *Width* is associated with an object's *side-to-side* dimension.
- Height is associated with an object's top-tobottom dimension.
- Depth is associated with front-to-back distance.



TOP VIEW







RIGHT SIDE VIEW

FRONT VIEW



- A technique used to create Multi-View drawings.
- Any projection of the features of an object onto an imaginary plane of projection.
 - The projection of the features of the object is made by lines of sight that are perpendicular to the plane of the feature

The best way to understand *orthographic projection* is to imagine an object contained inside a glass box.



There is a total of six glass walls surrounding the object. Each wall represents a projection plane onto which a twodimensional object view will be created.



Projection Plane

Also referred to as a *plane of projection* or *picture plane*, is an imaginary surface that exists between the viewer and the object.

The surface onto which a two-dimensional view of a three-dimensional object is projected and created.

Start by focusing only on the front *projection plane*.

A person standing in front of the object would see only the five corners identified in black.



Projection lines are used to project each corner outward until they reach the **projection plane**.



Projection Line

An imaginary line that is used to locate or project the corners, edges, and features of a three-dimensional object onto an imaginary two-dimensional surface.

The visible edges of the object are then identified on the *projection* plane by connecting the projected corners with **object lines**.



The *orthographic projection* process is then repeated on the other *projection planes*.



Orthographic View Selection

Recommendations for how to select the front view

- Most natural position or use
- Shows best shape and characteristic contours
- Longest dimensions
- Fewest hidden lines
- Most stable and natural position

Orthographic View Selection



Number of Orthographic Projections

One View

- Uniform thickness or shape
- Two views would be identical
- All dimensions properly and easily shown on one view





Number of Orthographic Projections

Two Views

- Symmetrical part
- A third view would be identical to one other
- Second view is necessary for depth



Given the overall dimensions of the object, a pencil, and a sheet of graph paper, a sketching multi-view drawing can be easily done using points, construction lines, and object lines.



Step 1 - Layout the boxes within which the individual views will occur using points and construction lines.



Step 2 - Use construction lines between the views to indicate the geometry of the views.



Step 3 - Identify the visible edges with Object lines.



Step 4 - Locate hidden lines.



Historical Example

Leonard P. Karr (1913-1995) designed a man-sized hunting blind shaped like a goose called Super Goose, 1991.

- How would you label the views presented in the drawing?
- Are Mr. Karr's views properly aligned based on the orientation presented here?
- How would you rearrange the views to orient



Hunting blind, 1991 Leonard P. Karr, Yakima, Washington nk and pencil on paper Doodles, Drafts and Designs: Industrial Drawings from the Smithsonian



Smithsonian Institution http://www.sil.si.edu/exhibitions/doodles

A Question...

Each of the blocks at right has the same overall dimensions and color. What else do they have in common?



A Question...

They all have identical top views!

