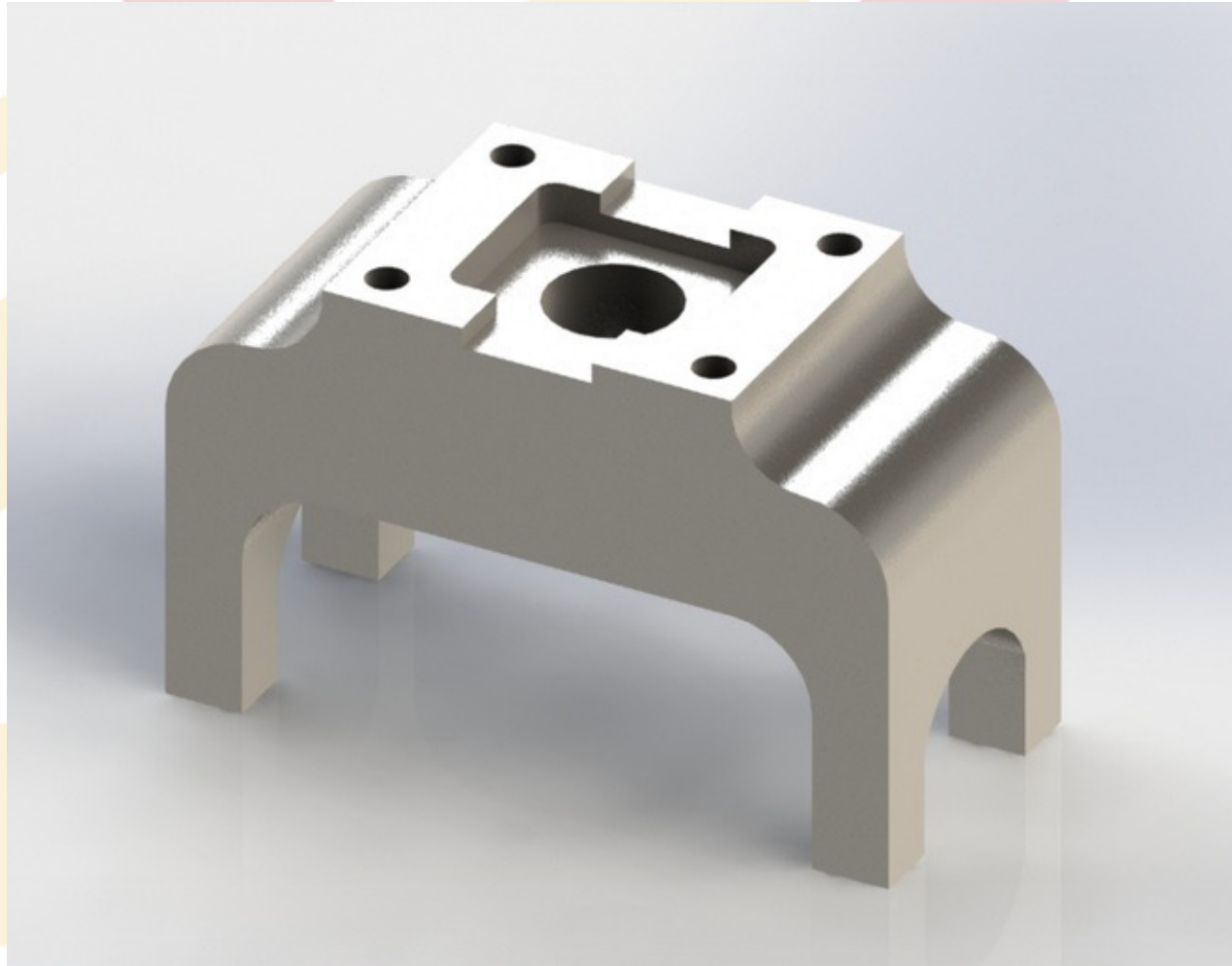
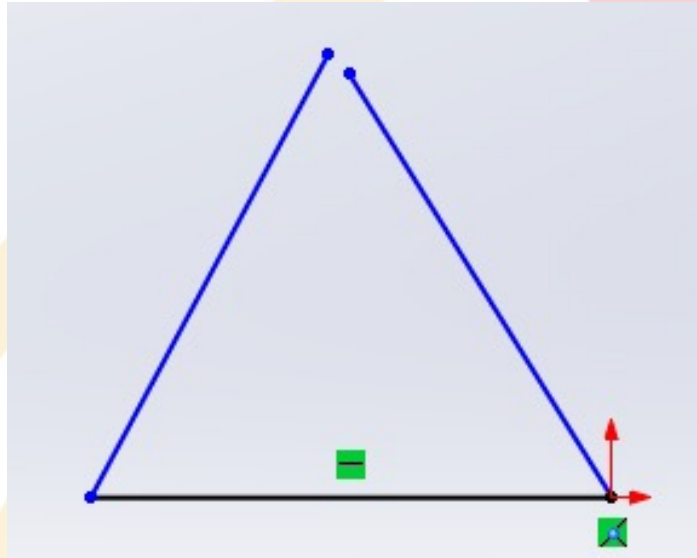


More Modeling in SolidWorks

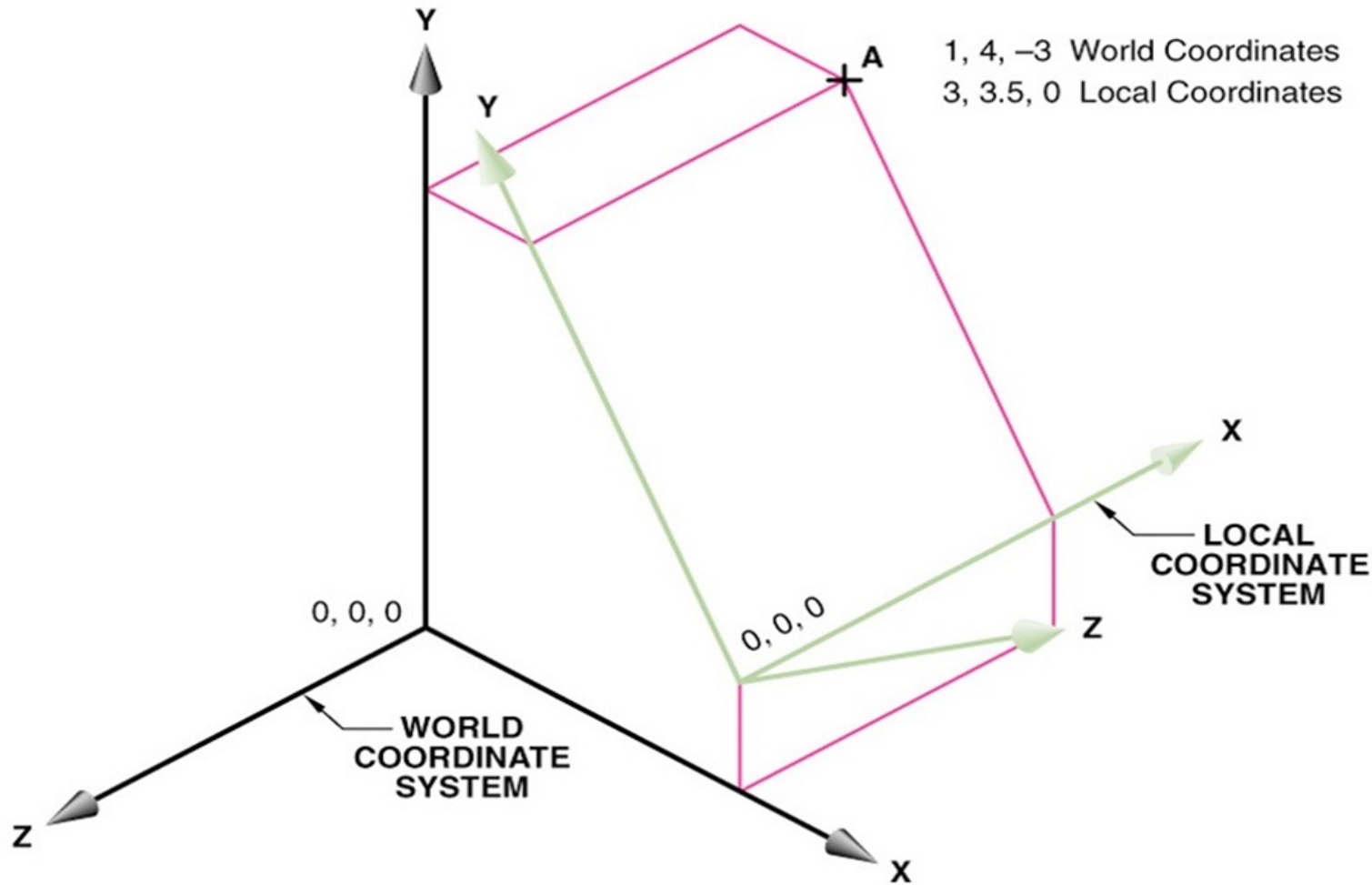


Refresher:

- Do these sketches create 3D features in Solidworks?



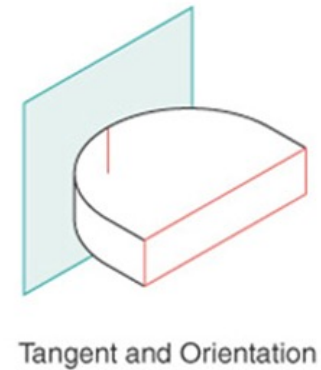
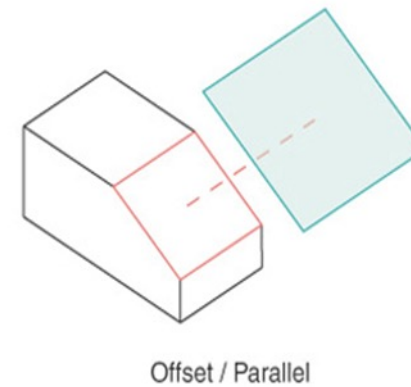
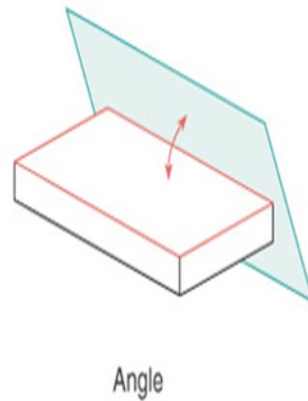
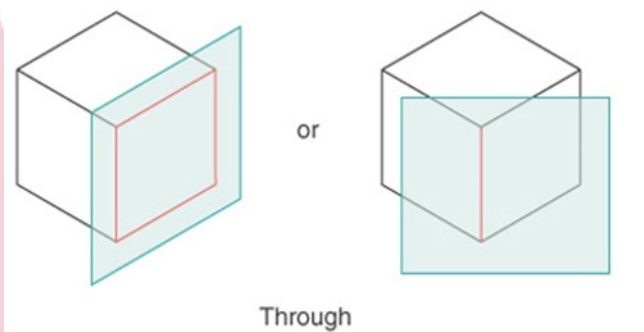
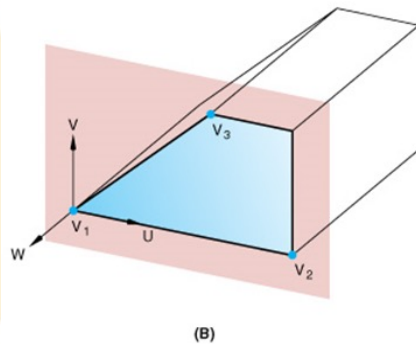
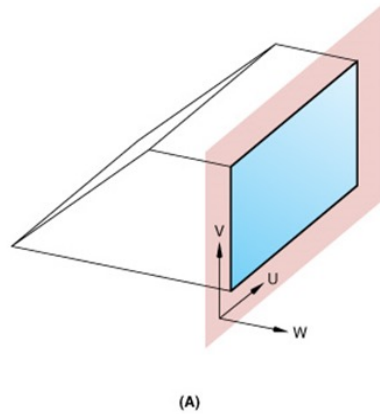
Coordinate Systems



- Local Coordinate Systems make geometry creation easier.
- Origin for LCS can be anywhere on model

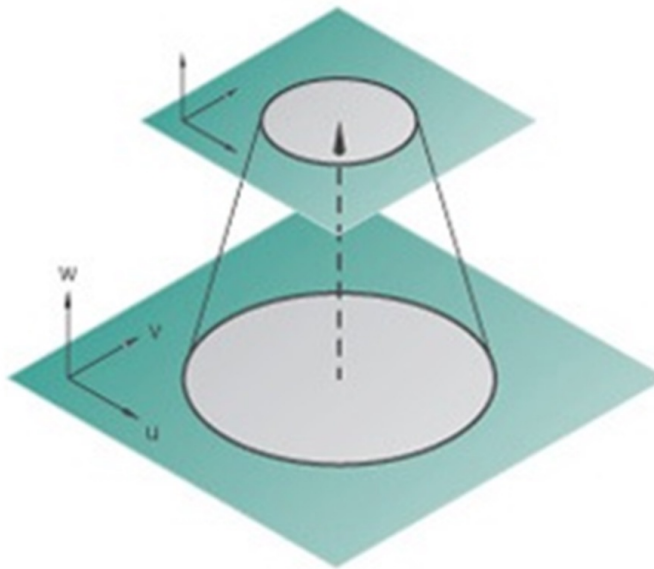
Workplanes

- Canvas for drawing the construction geometry of a part (profile, construction lines, etc.)



Blend Extrusion

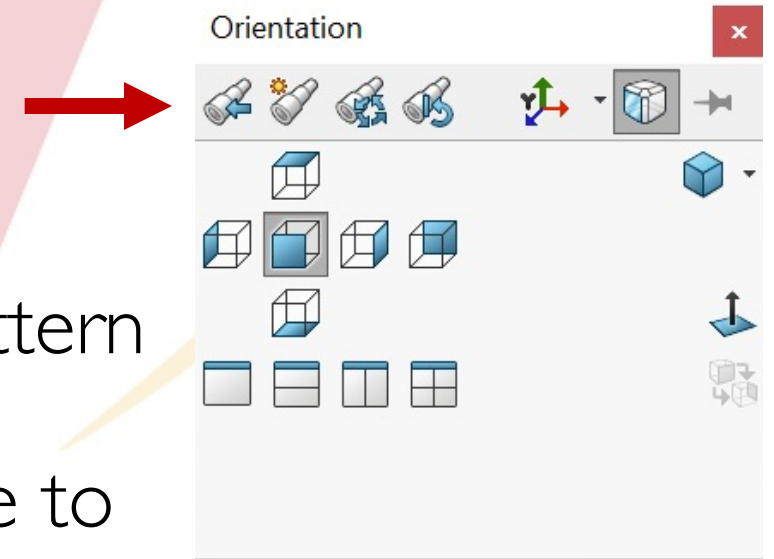
- Loft: create a profile on the base plane, define the second plane (with a second profile) to which the initial profile will be extruded to



(8)

Other helpful SolidWorks tools

- Reference Geometry>Axis
- Linear Pattern>Linear Pattern or Circular Pattern
- Hold down the center button of your mouse to rotate your part
- Press Space Bar on keyboard to get this
 - Allows you to easily orient the part being modeled



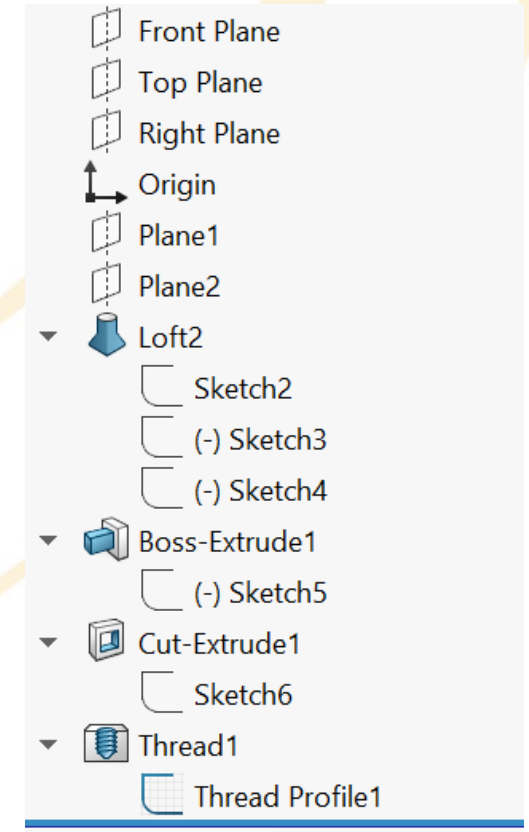
Constraint-based Modeling

- Collection of features

- Ex: Extrude, Extruded cut, Revolve, Fillet/Round, Chamfer, Sweep, Loft, etc.

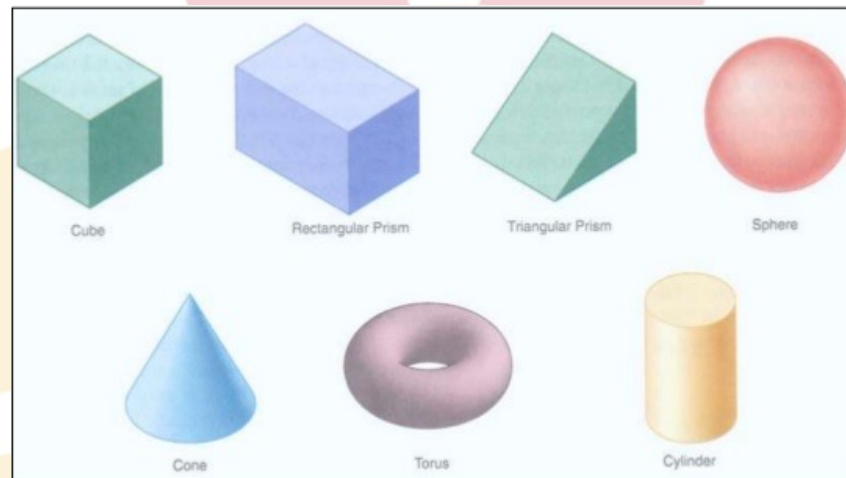
- Parts Tree

- Pay attention to the parent/child relationship between a feature and its sketch

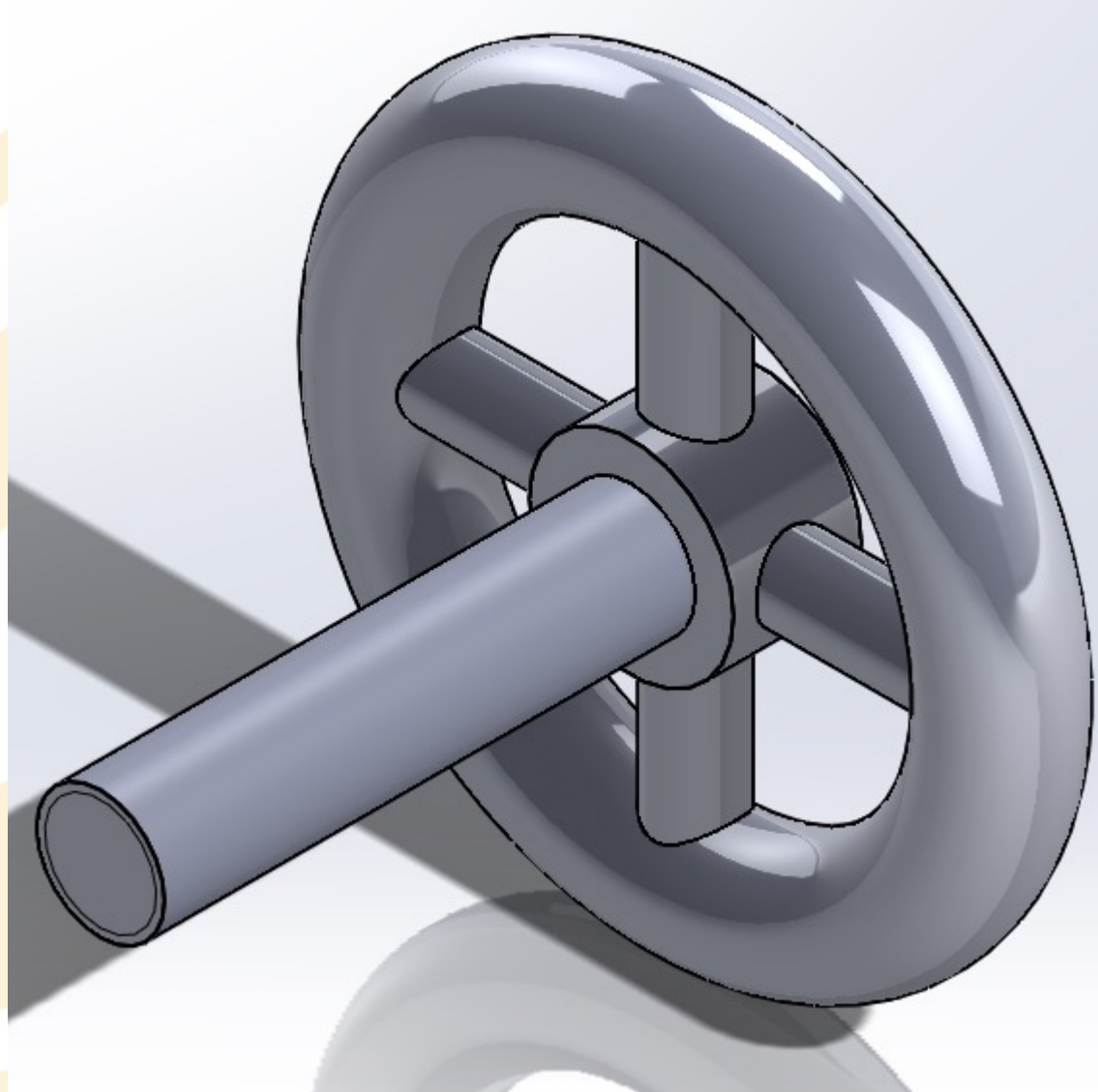


Solid Primitives

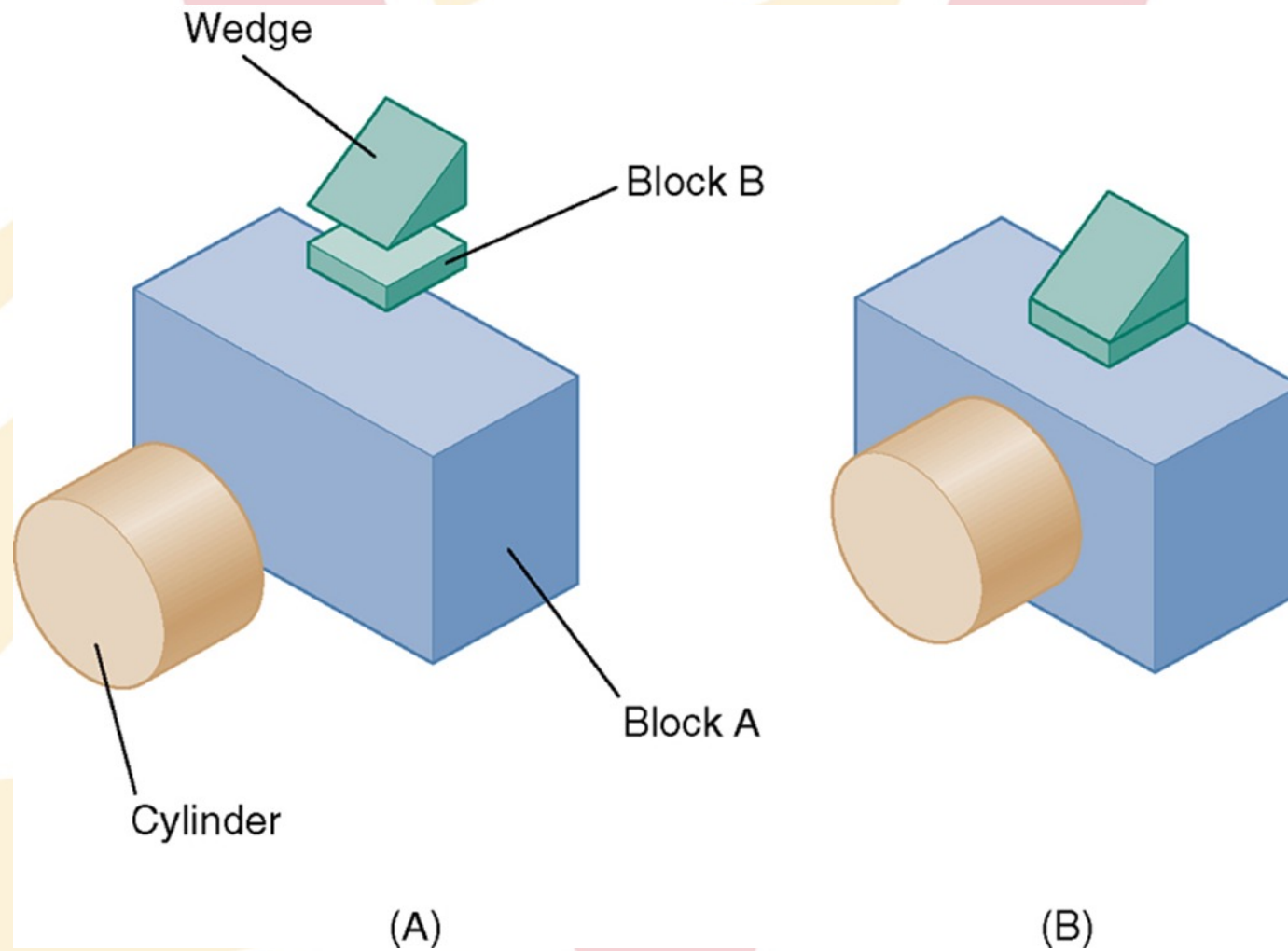
- Almost every object can be decomposed into its most fundamental, 3-dimensional geometries
- Solidworks can only create a limited set of 3D objects
- Combine these to make a complex object!



What are the fundamental 3D geometries of this part?

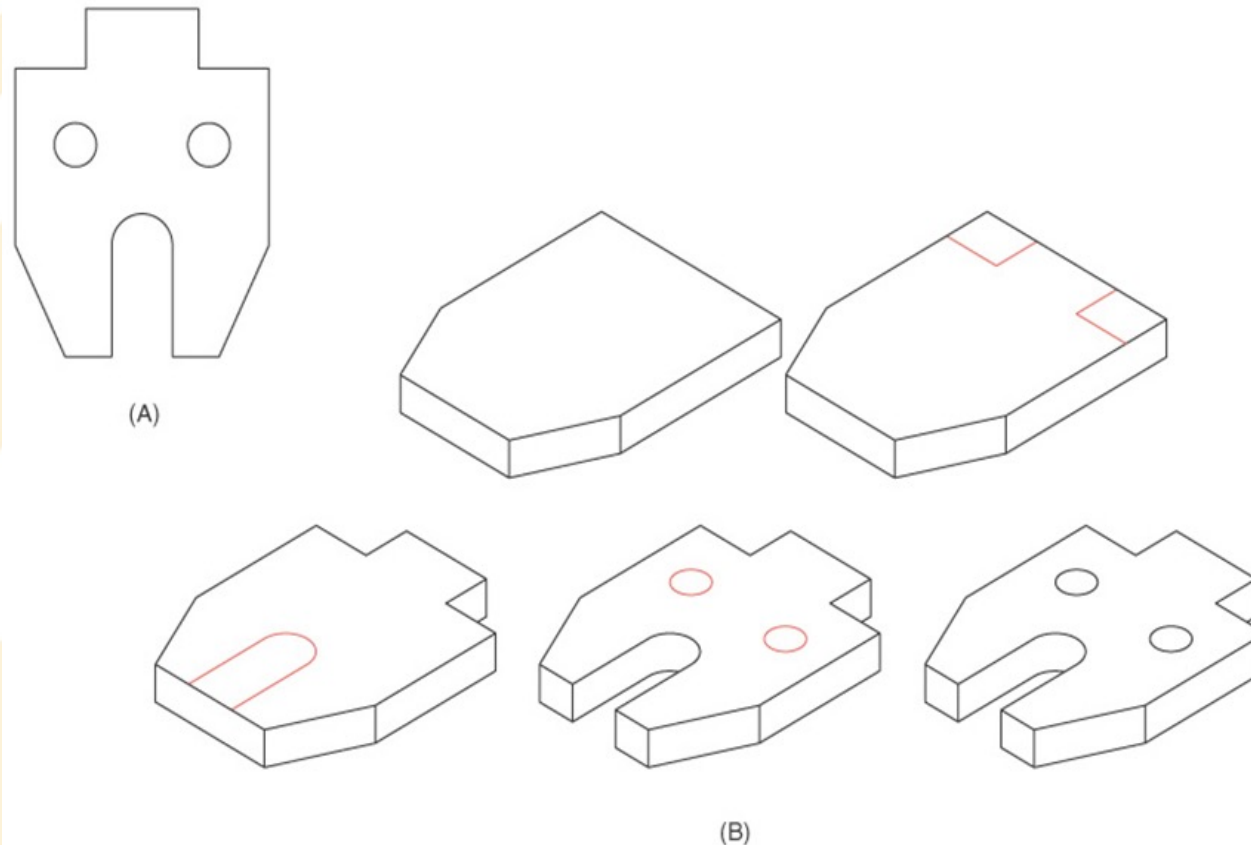


Make this part...

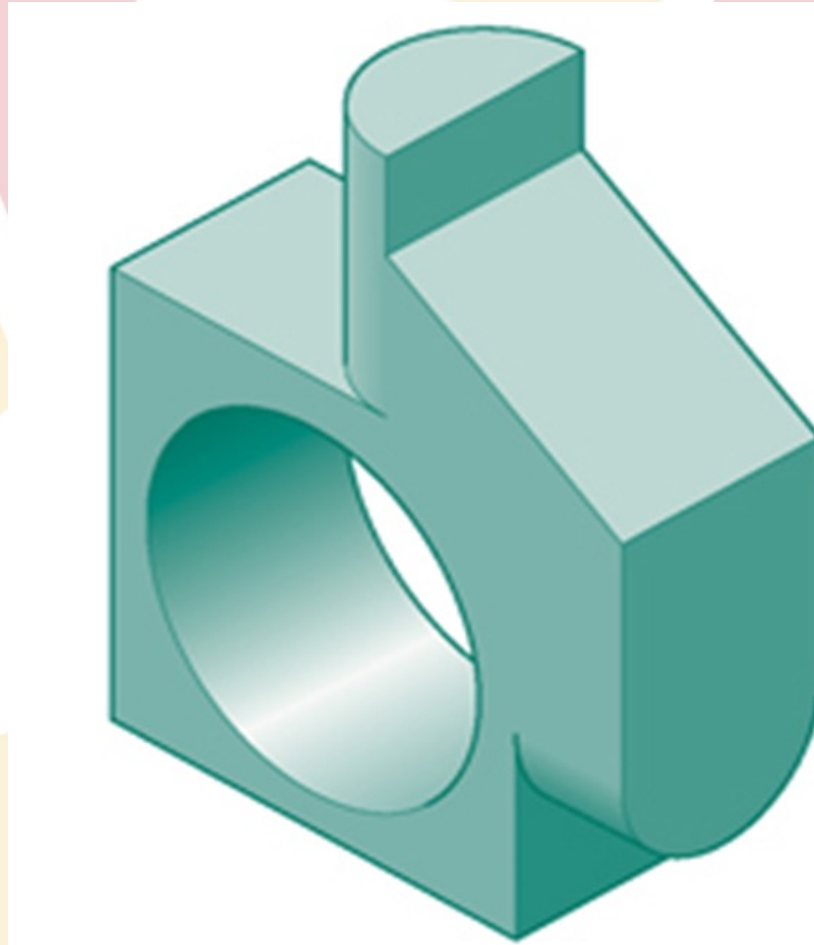


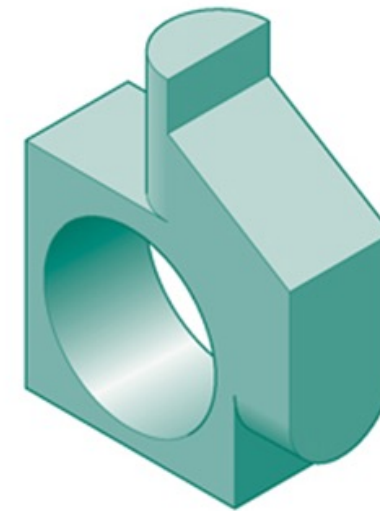
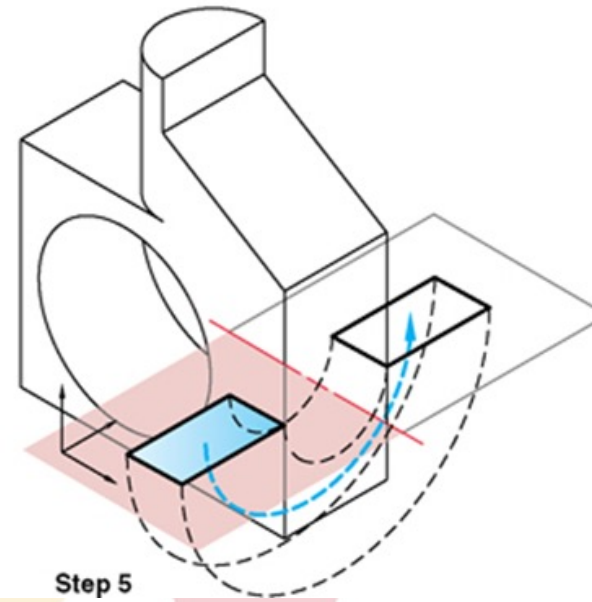
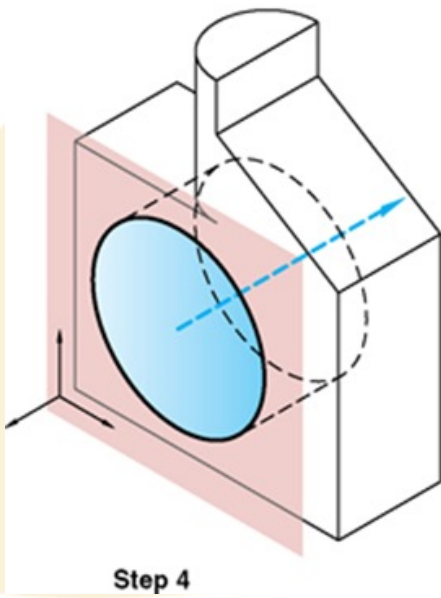
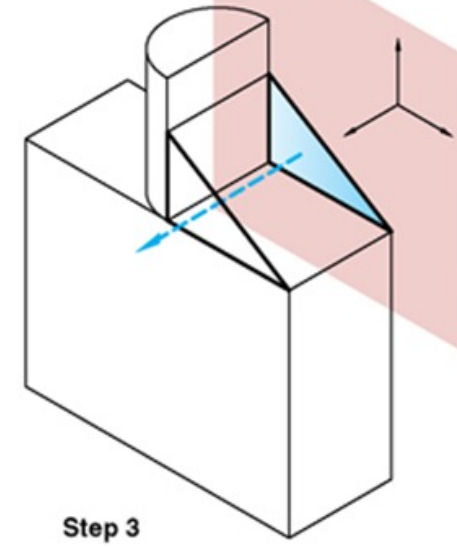
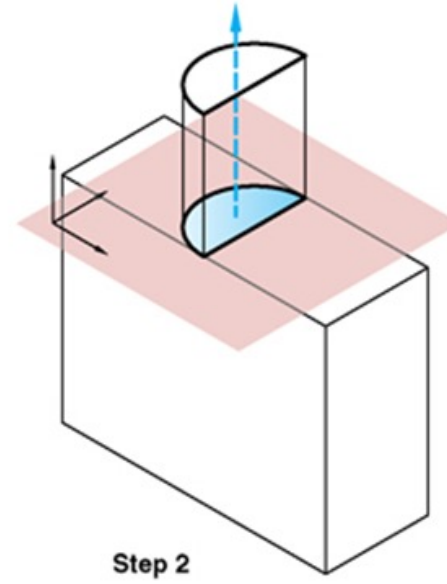
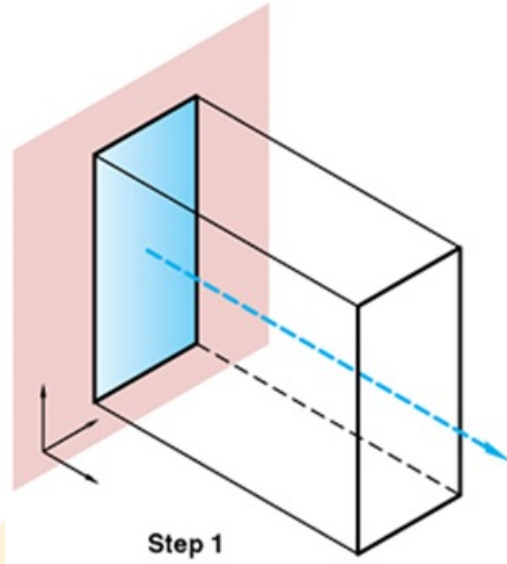
Feature Definition

- The order in which a part's features are added to it is important!
- Look for major features first.

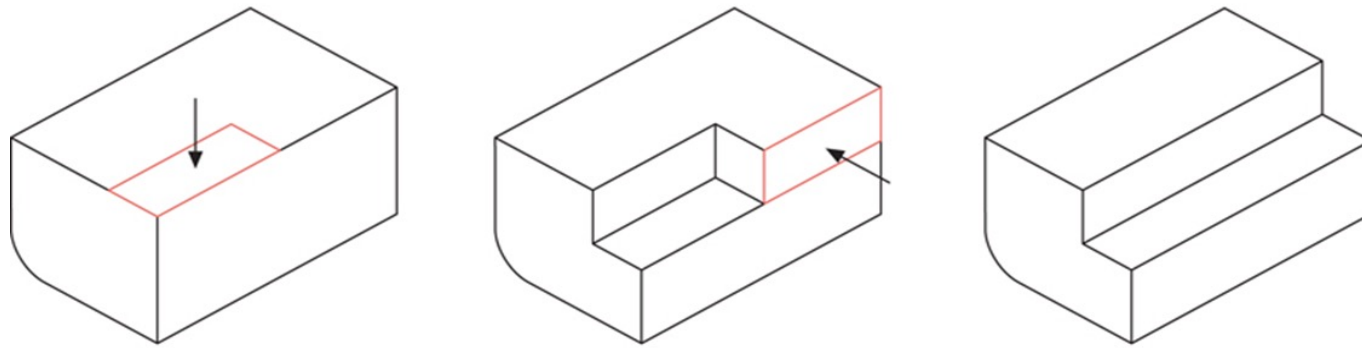


How would you model this part?

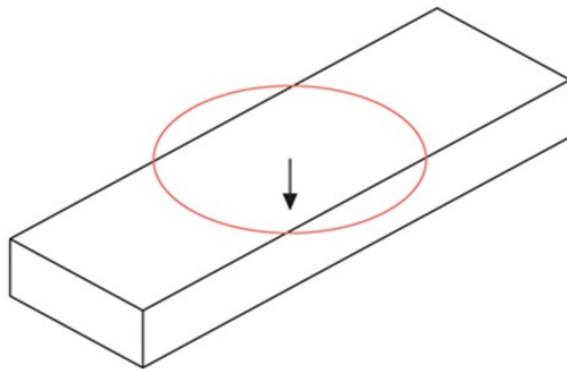




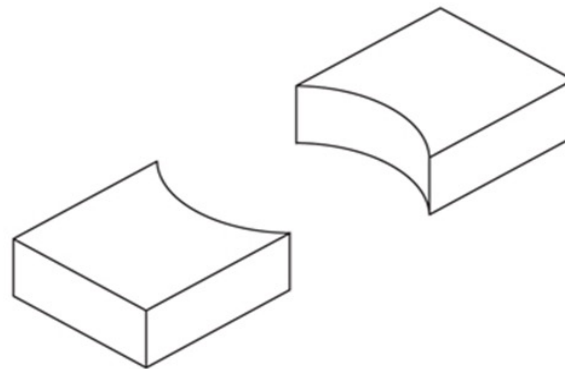
Feature Definition- How not to do it



(A)



(B)

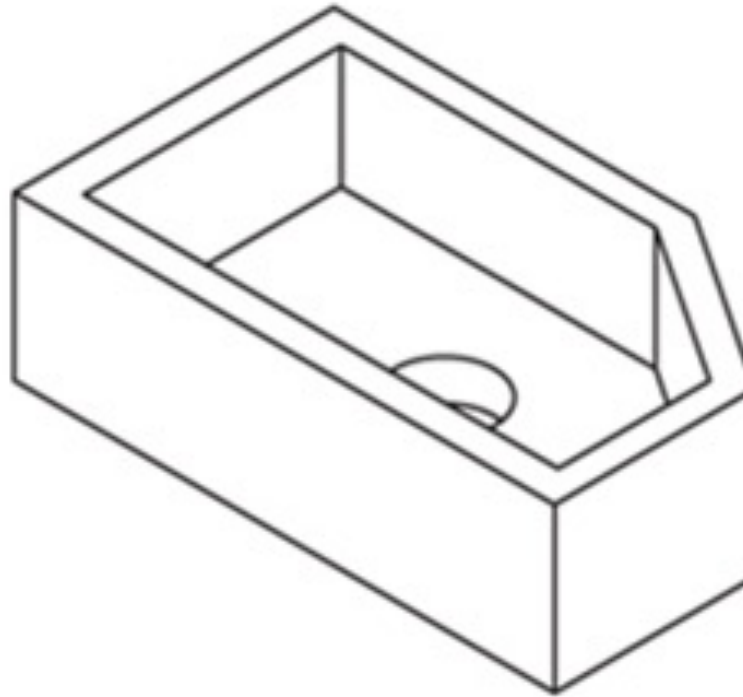


Too many steps!

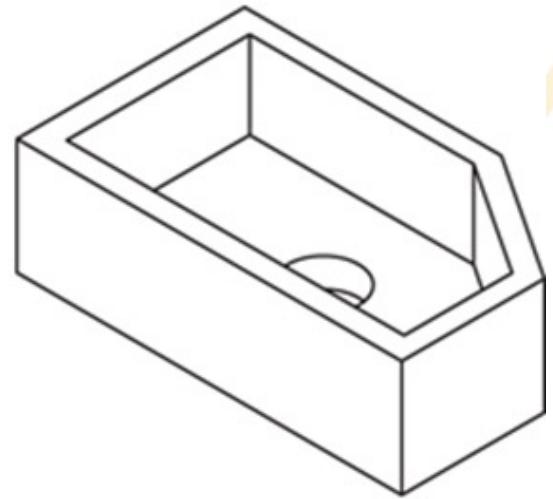
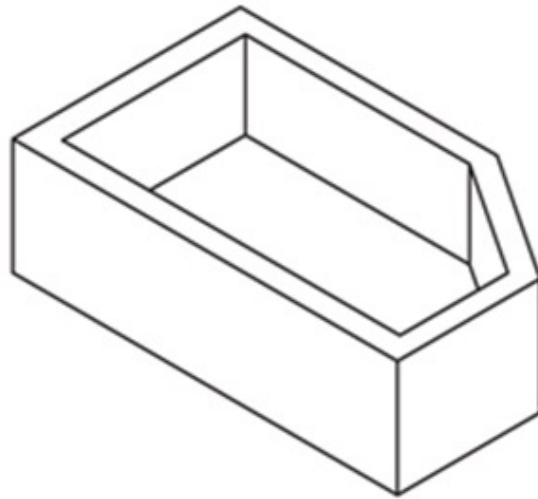
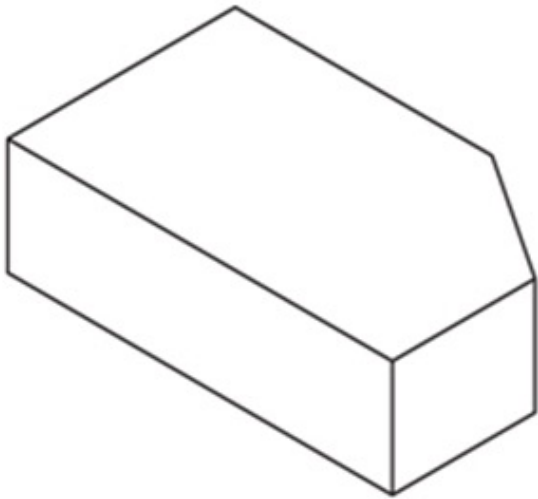
Don't make two parts from one!

Try this...

- ◉ Model this hollowed out, angled, box with a hole in it.



Box
↓
Shell
↓
Hole



Break Time...get up and move!

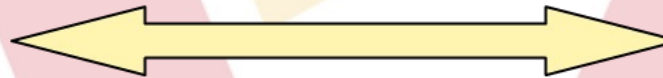
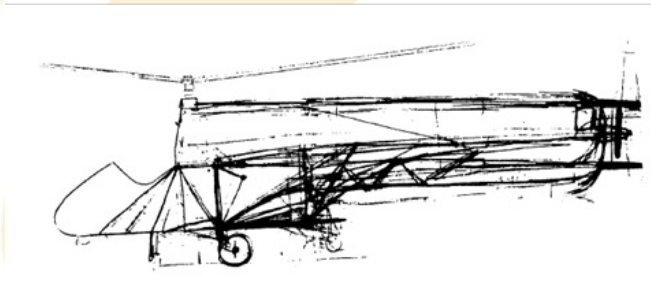


Technical Drawings

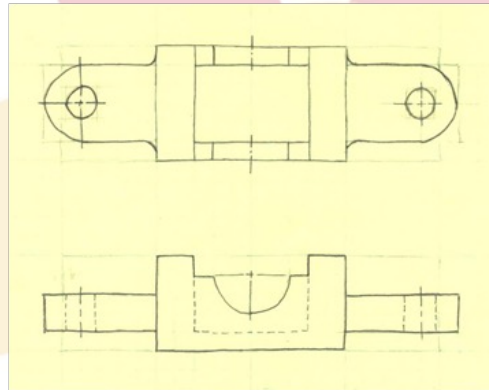
- *rough draft of product that highlights its main features

Less Detail
Less Structure

Design
Sketching

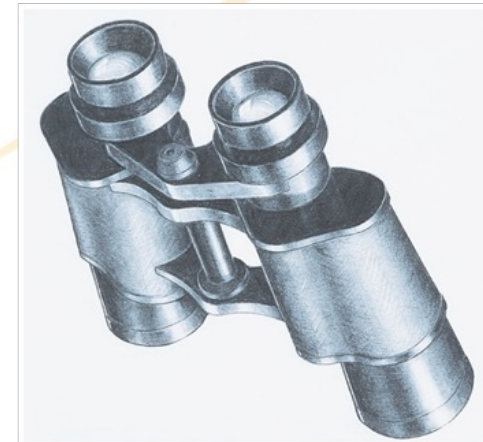


Freehand Technical
Drawing



More Detail
More Structure

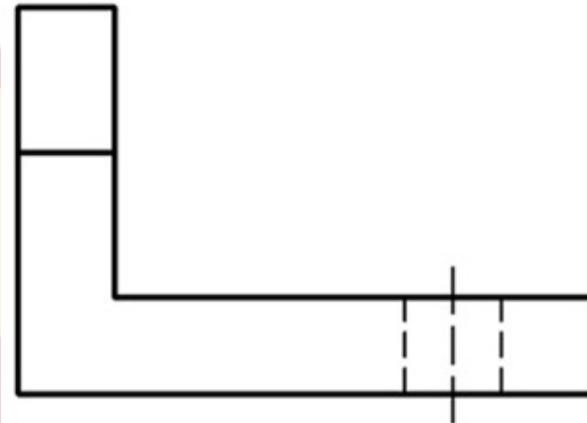
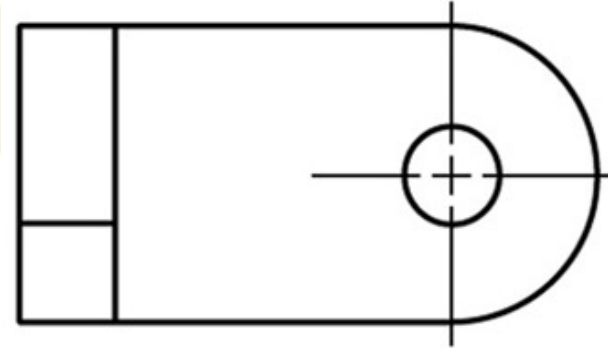
Freehand Technical
Illustration



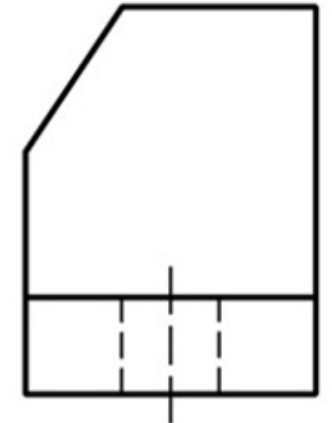
Multiview Drawings

- 2-Dimensional
- Generally, three parallel projections (principle) are used.

Top view



Front view

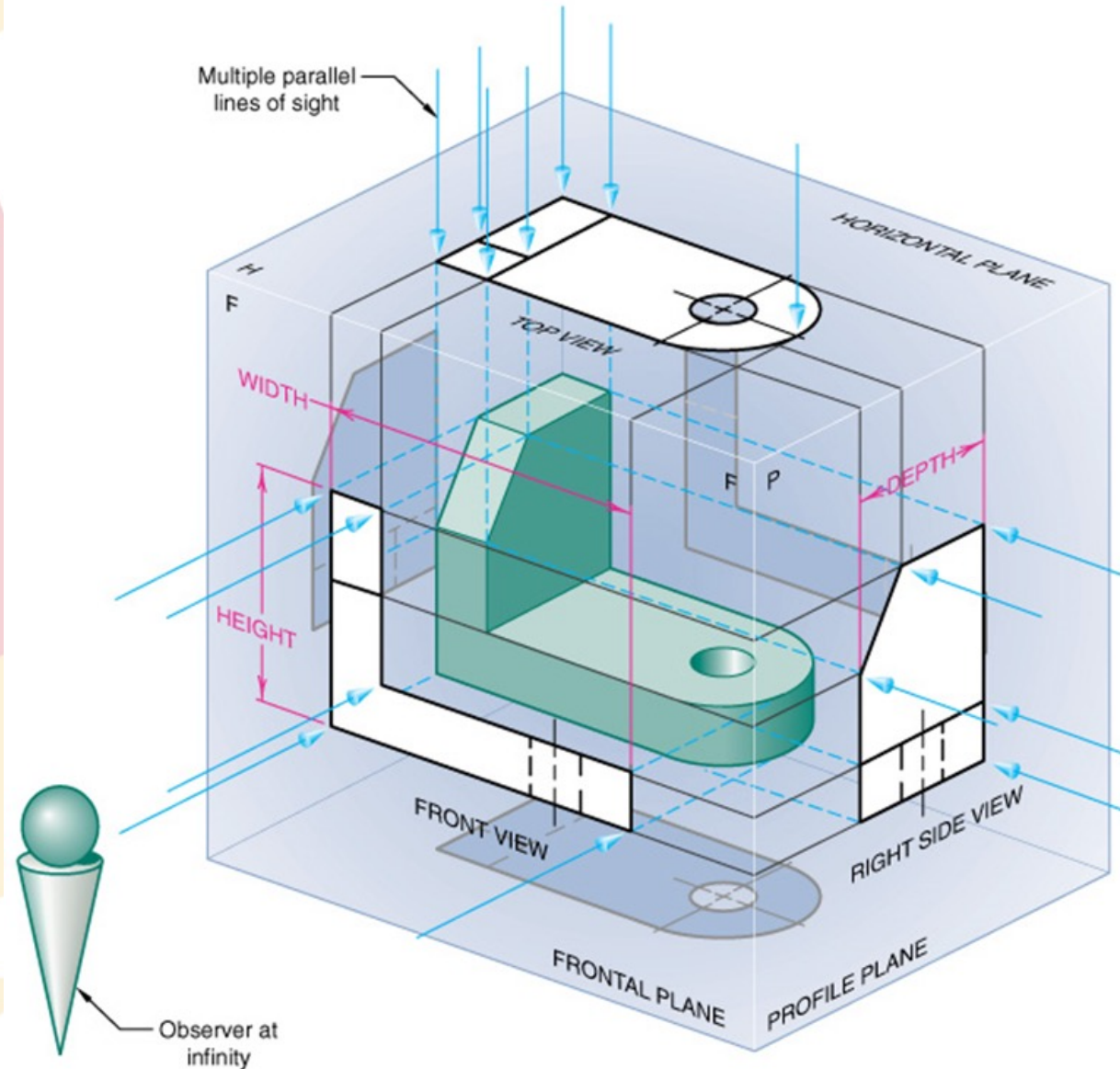


Right side view

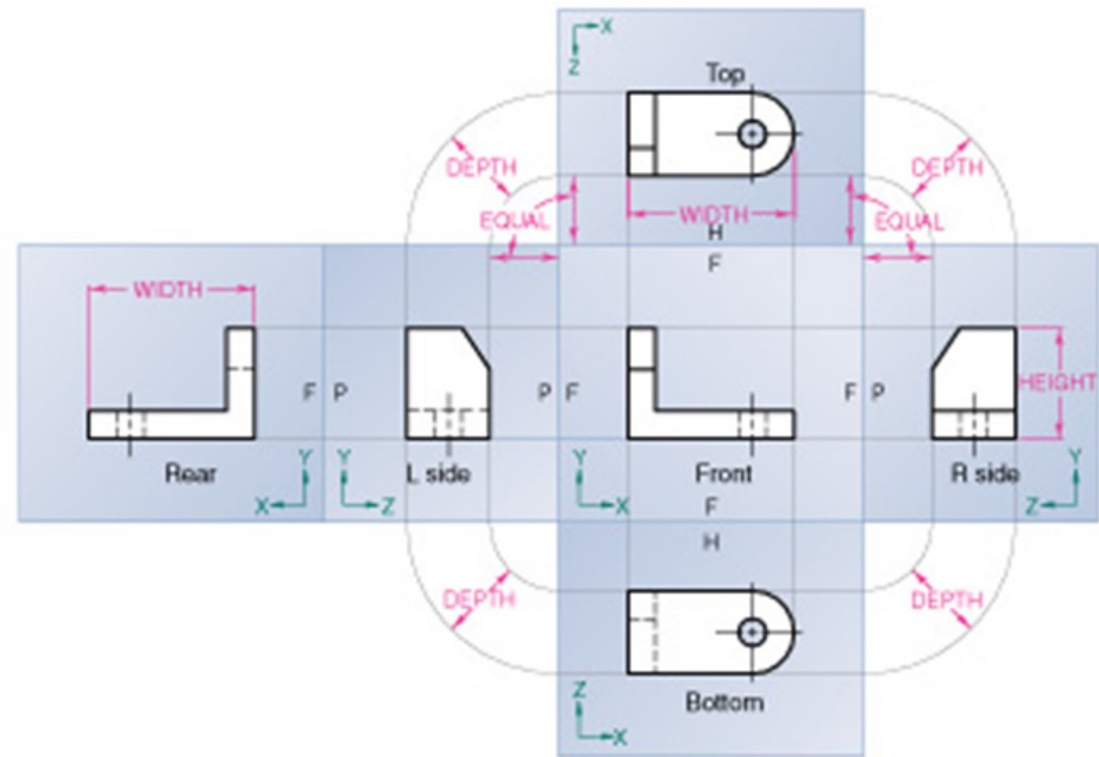
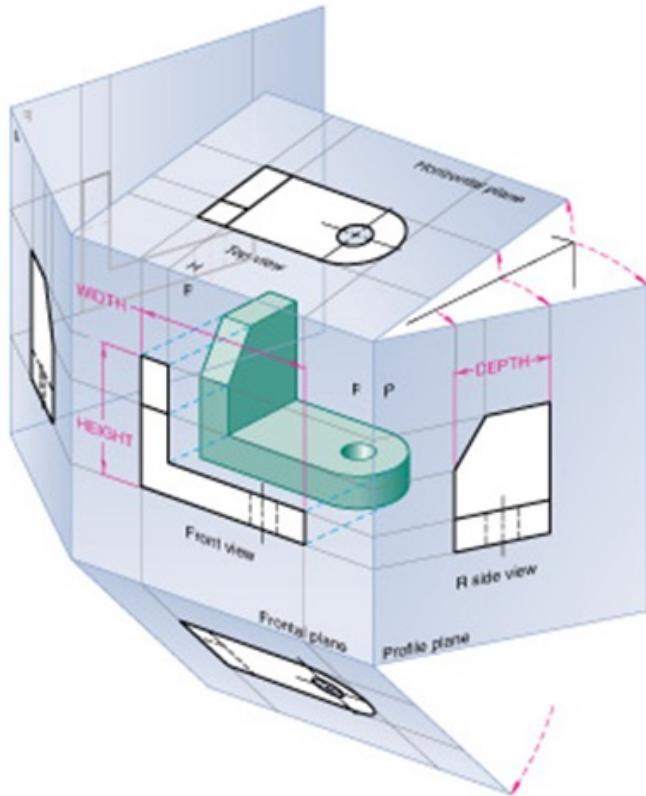
Projected Views

- Six total views of a part:

- Front
- Top
- Right
- Left
- Back
- Bottom



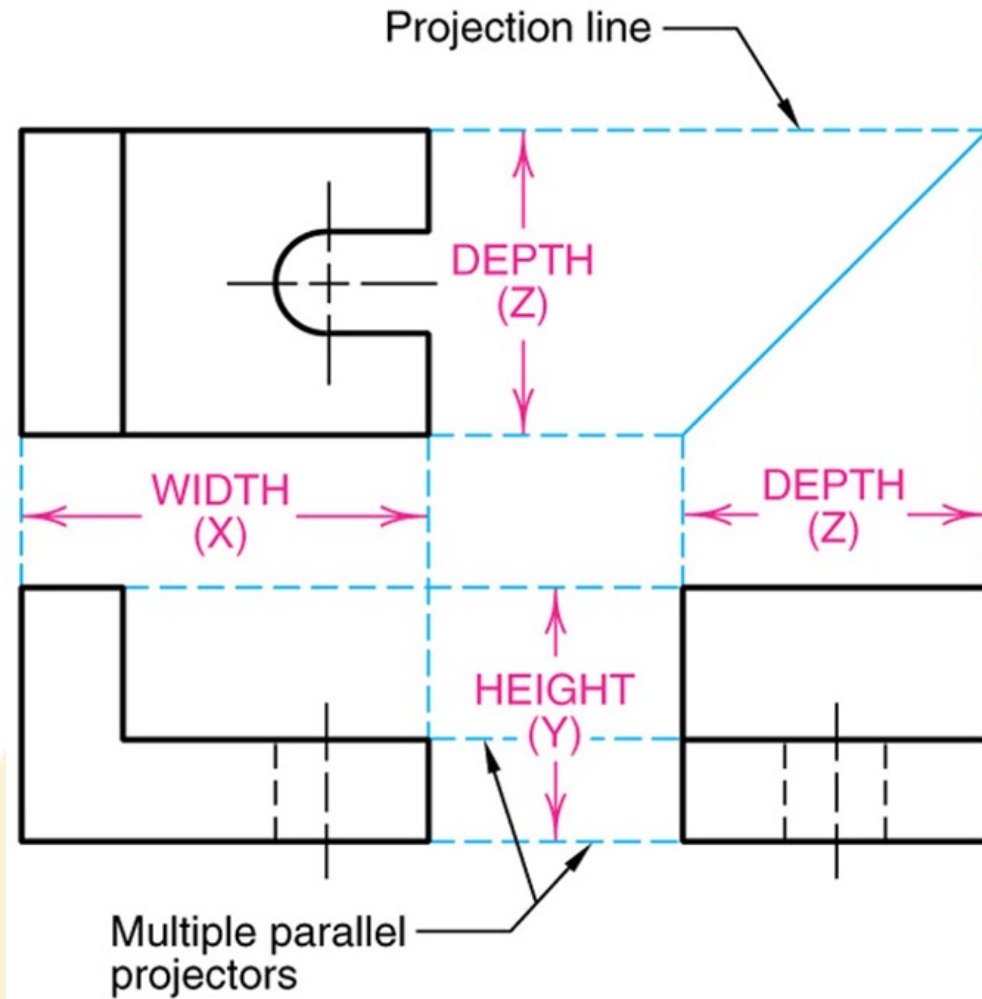
To help visualize...



Adjacent Views

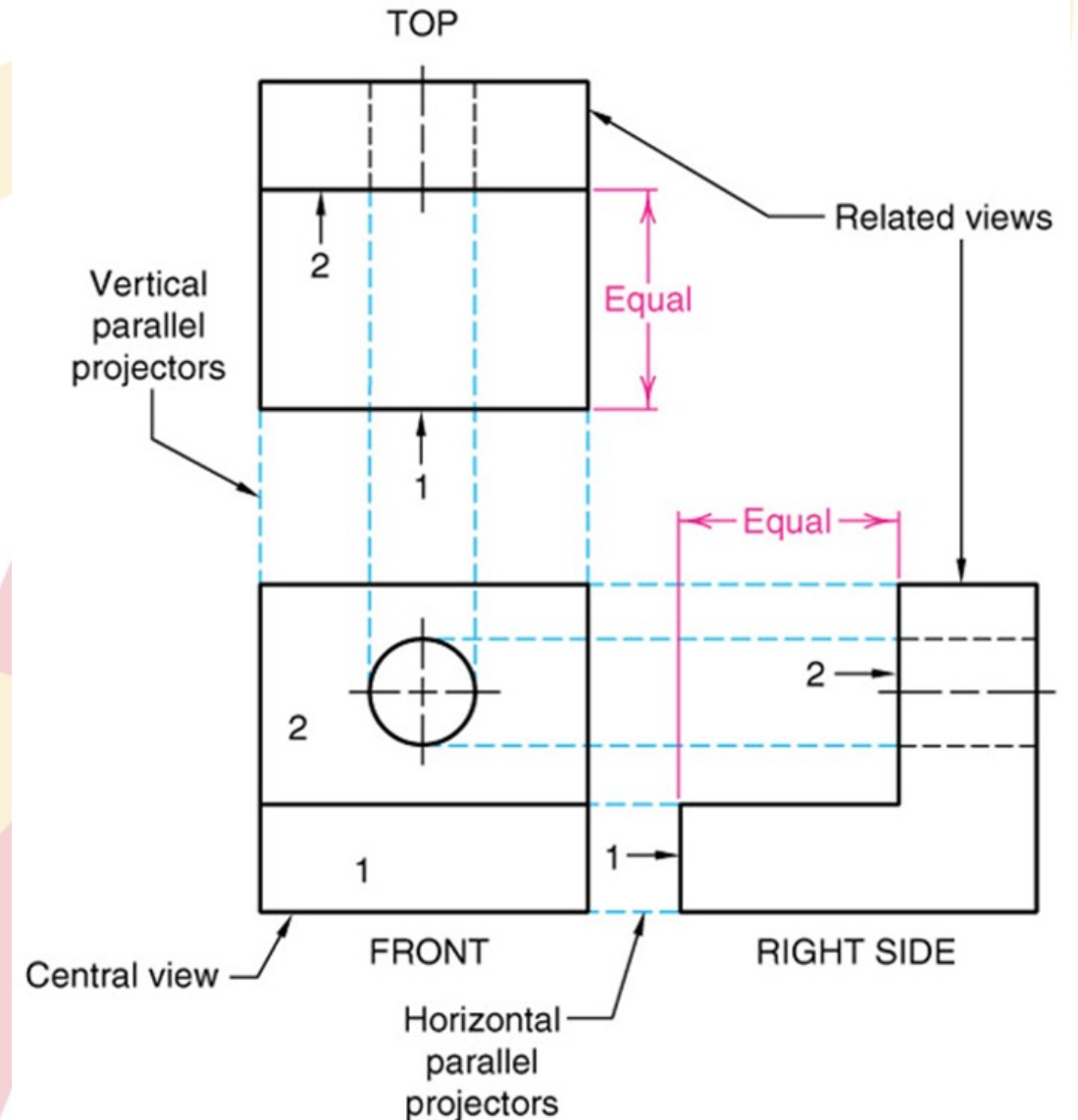
Note: all necessary information to model a part is given in its technical drawing.

*Do the math to find the dimension of a feature that is not directly given to you.



Take a closer look...

- Orthographic Projection Rule 1:
Every point or feature in one view must be aligned on a parallel projector in any adjacent view.
- Note the projection lines located on the right and top views that represent the hole on the front view.



Activity

- Model these parts of the Vise in Solidworks ***All measurements are in inches***
 - Pin
 - Grip
 - Jaw
 - Shaft
 - Base (Hint: utilize a revolute extrusion)
 - Wheel (Hint: utilize a revolute extrusion)
- Note: Think about the part's main features and how to best model them. In what order should you model these features?