

Isometric Sketching

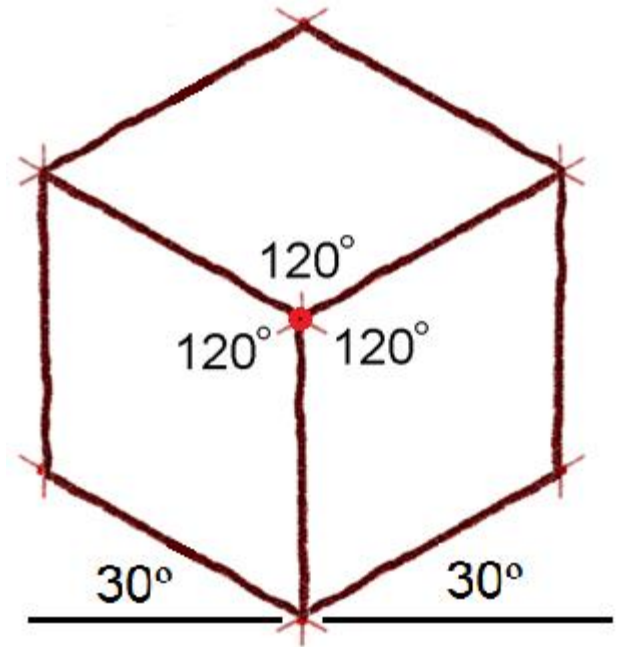
Learning Objectives

- Understand the vocabulary related to Isometric Sketching
- Be able to create Isometric Sketches using the Box method.

Isometric Pictorial

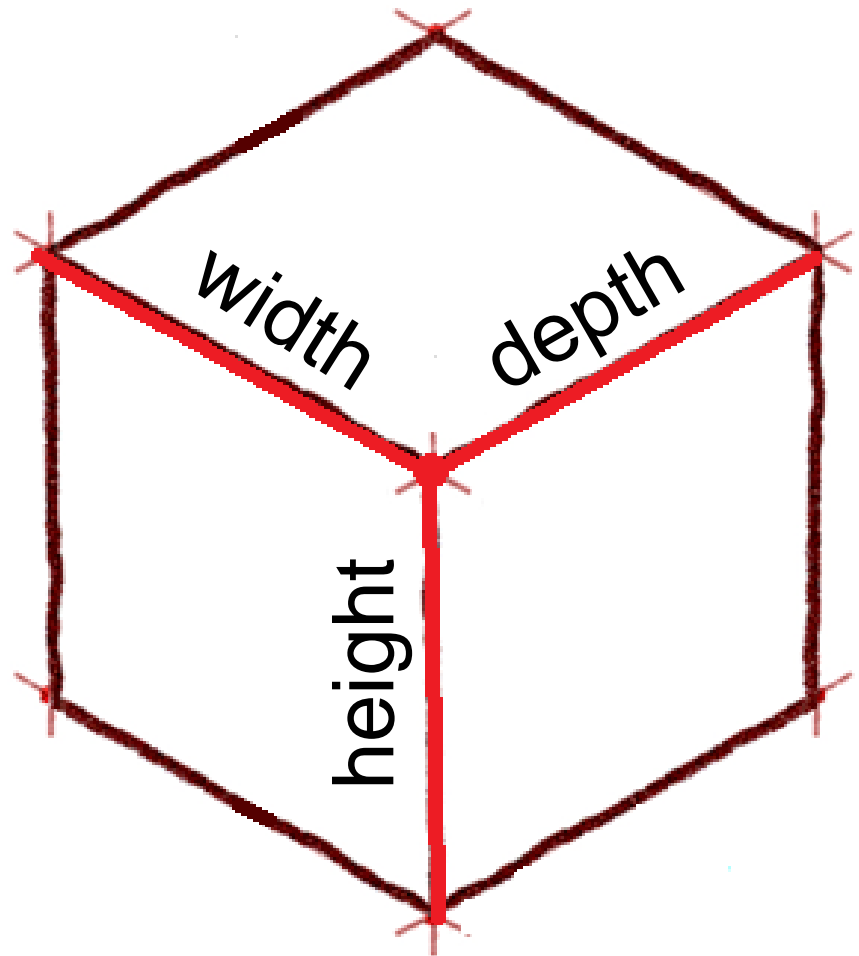
Isometric means *equal measure*.

- Three adjacent faces on a cube will share a single point
- Edges converge at one point will appear as 120 degree angles or 30 degrees from the horizon line

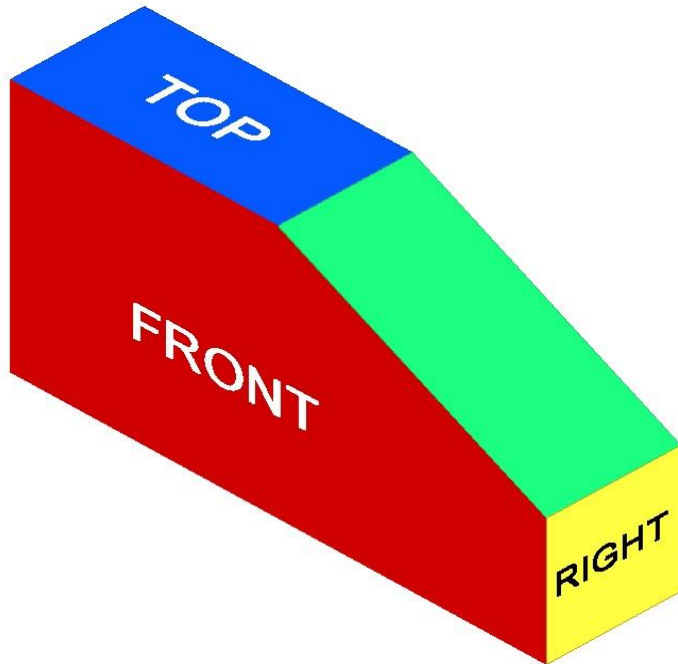


Isometric Pictorial

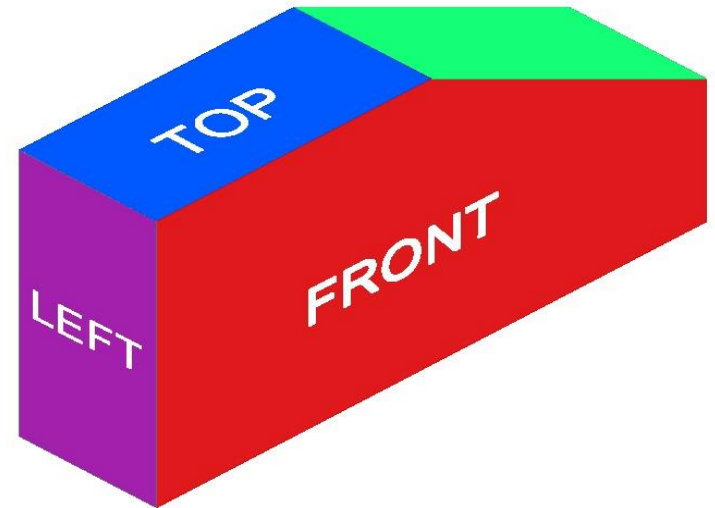
- These three edges represent height, width, and depth



View labels



Top, Front, Right Side
view orientation

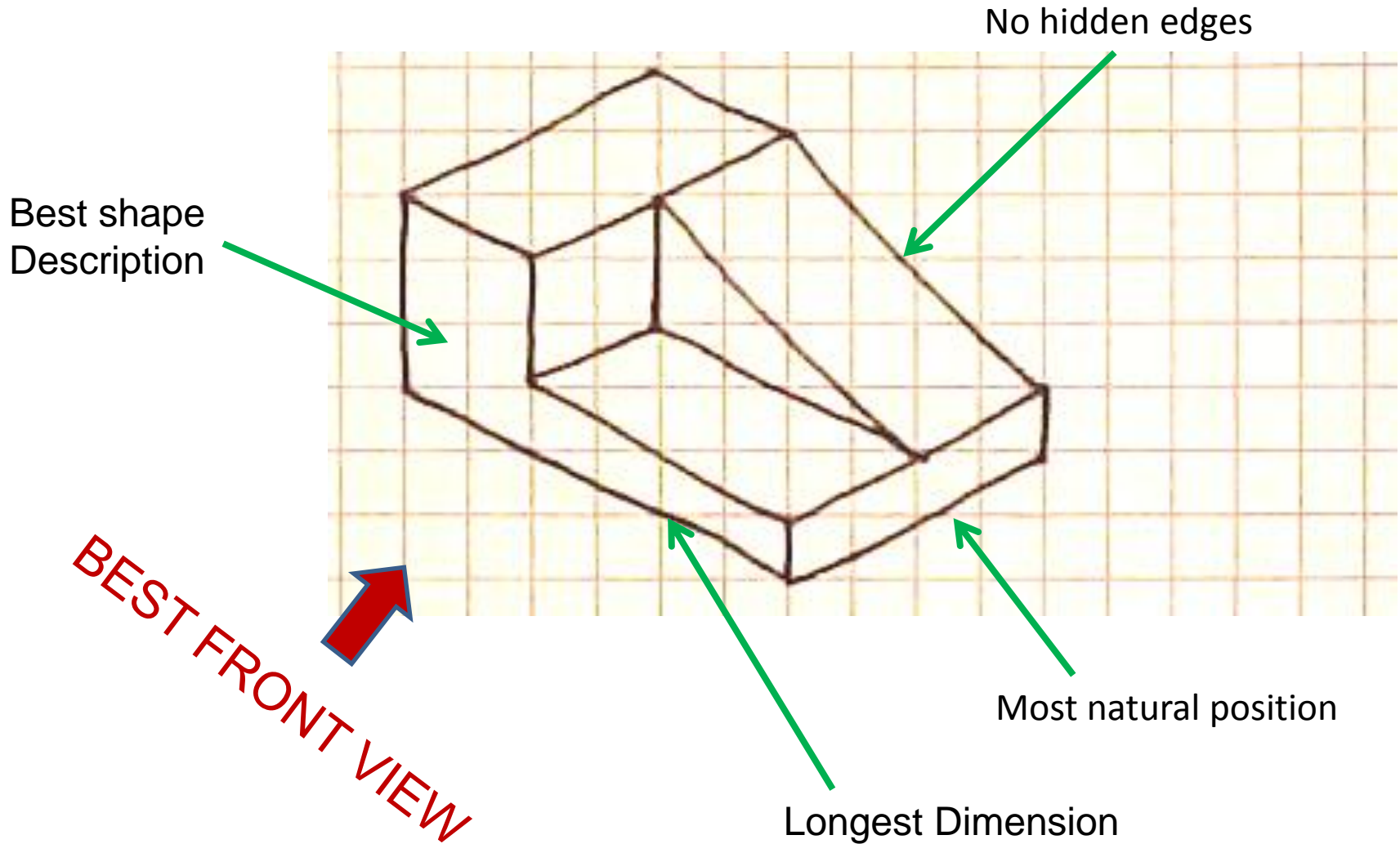


Top, Left Side, Front,
view orientation

View Selection

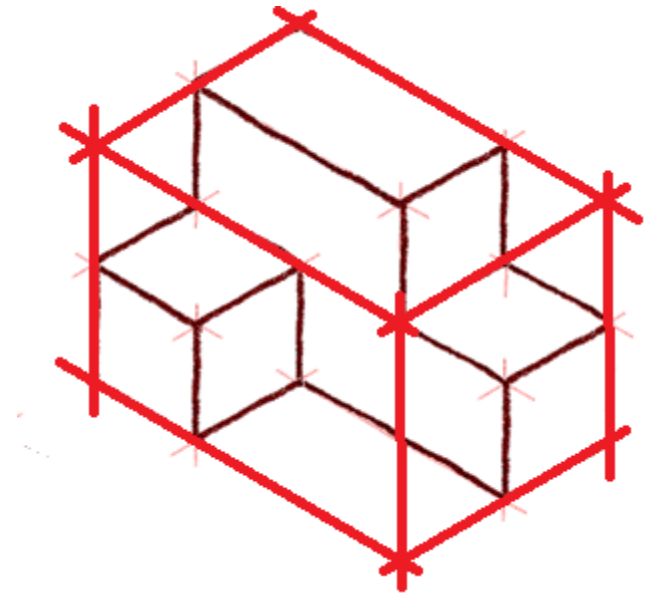
- Recommendations for how to select the front view
 - Most natural position or use
 - Shows best shape and characteristic contours
 - Longest dimensions
 - Fewest hidden lines
 - Most stable and natural position

Orthographic View Selection



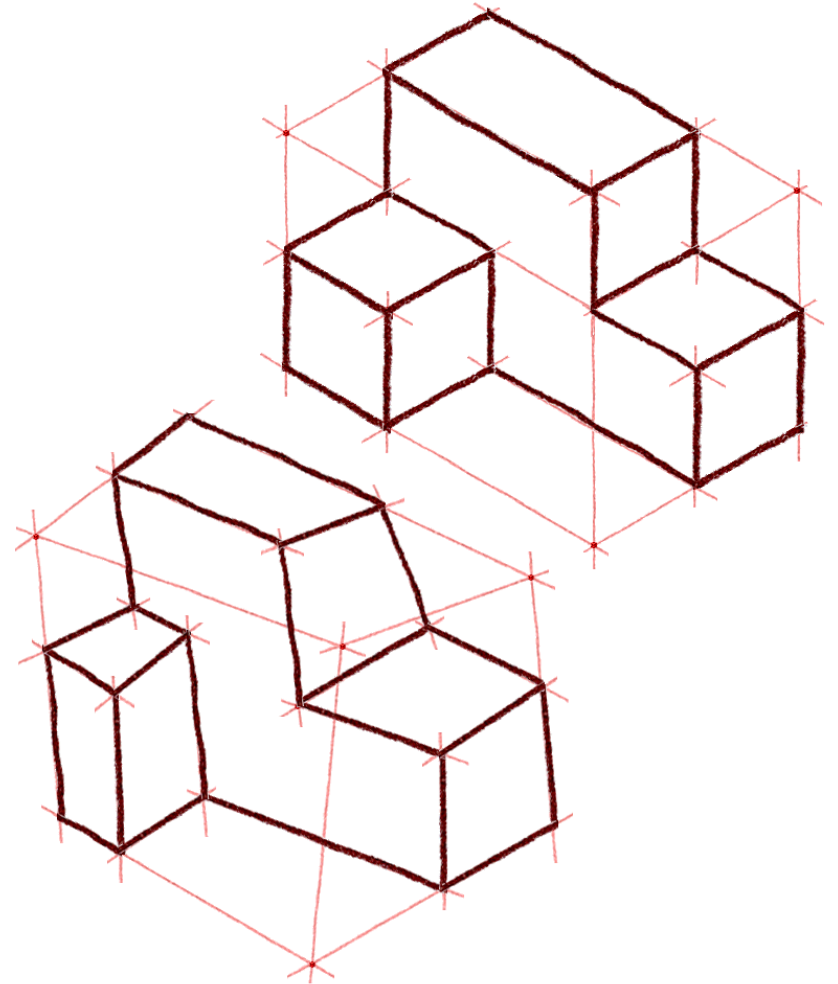
The Box Method

- The box method is a sketching technique used to maintain proportionality
- It starts with a sketcher envisioning an object contained within an imaginary box



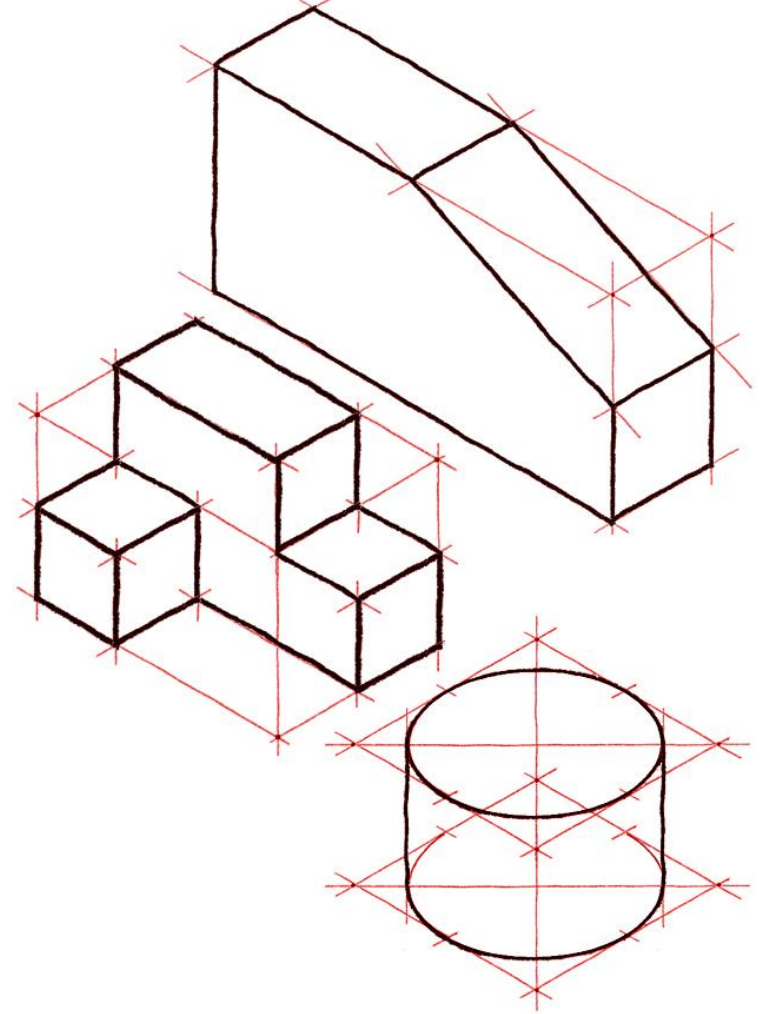
Proportion and Estimation

- Good sketching requires a sense of proportion, and the ability to estimate size, distance, angles, and other spatial relationships



Isometric Sketching

- The following examples show steps used to create isometric sketches of simple geometric objects, including tonal shading techniques



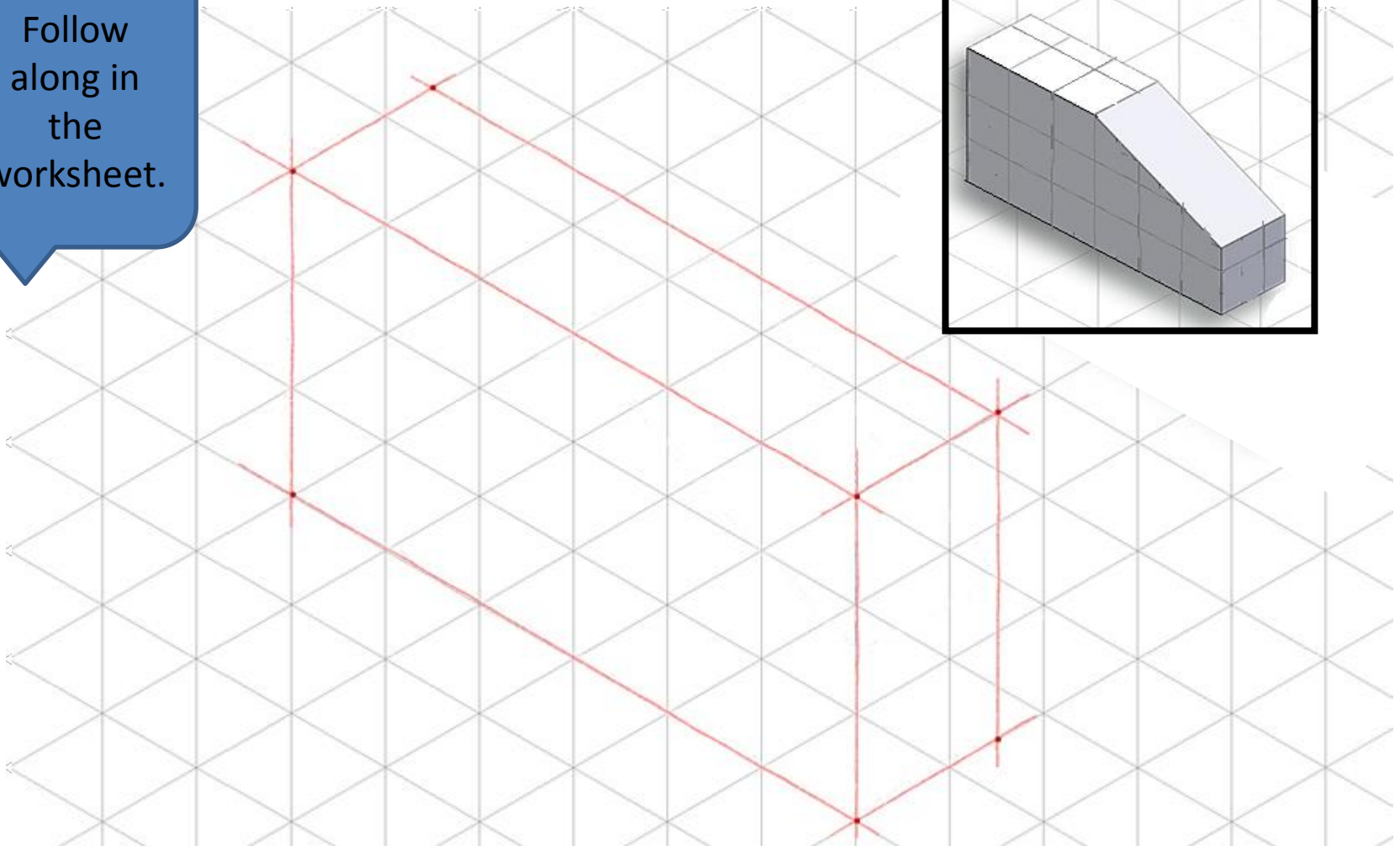
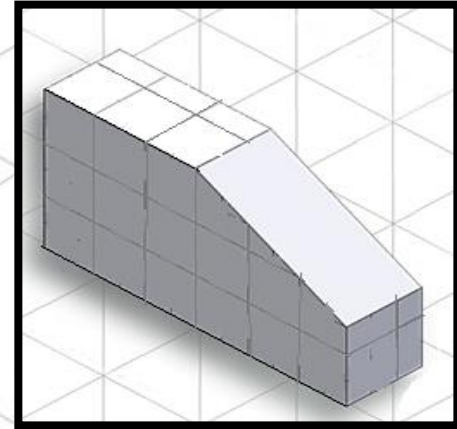
EXAMPLE 1

Isometric Sketch

Step 1: Construct the Box

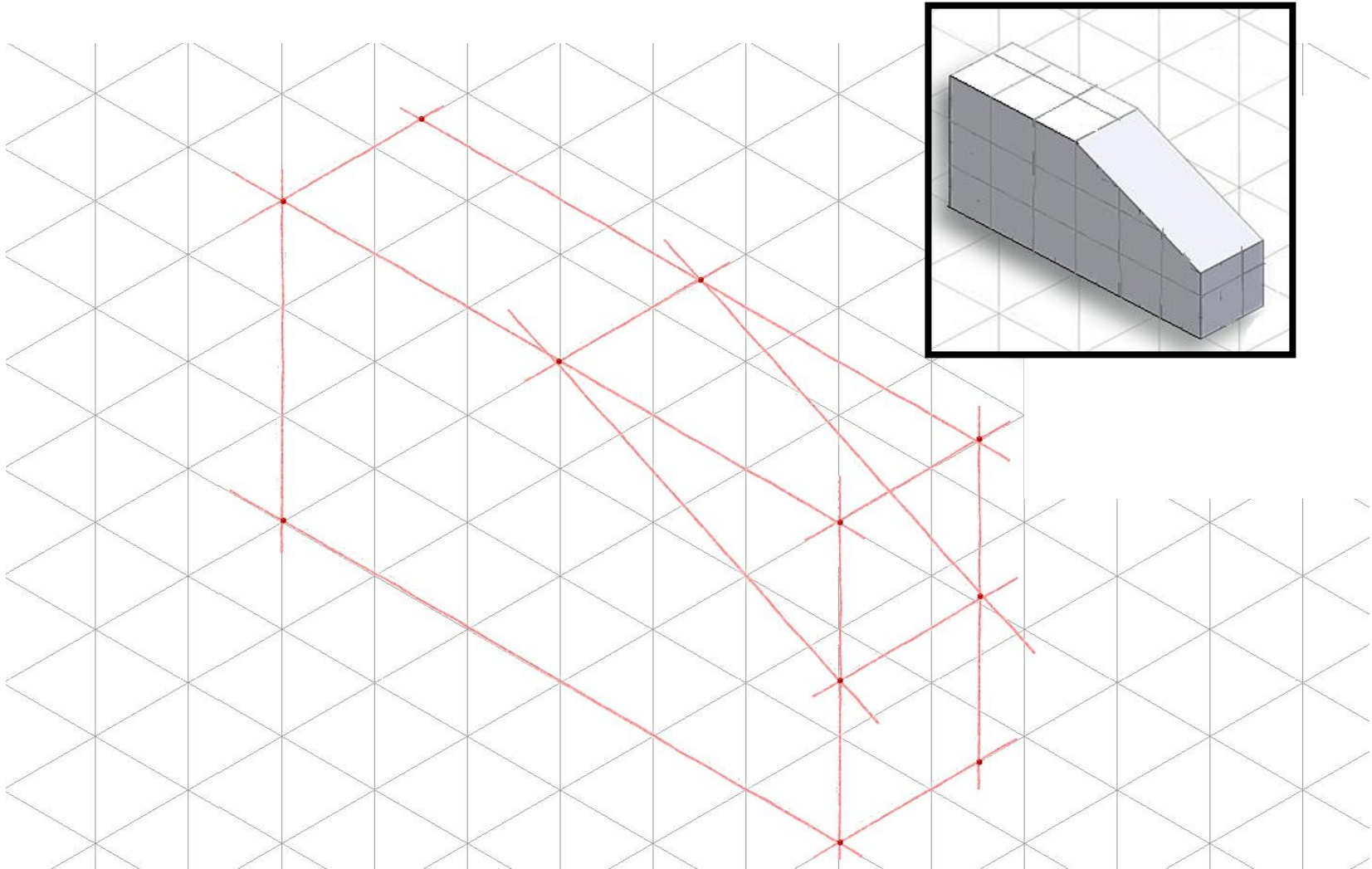
Layout the box that will contain the isometric view using points and construction lines

Follow along in the worksheet.



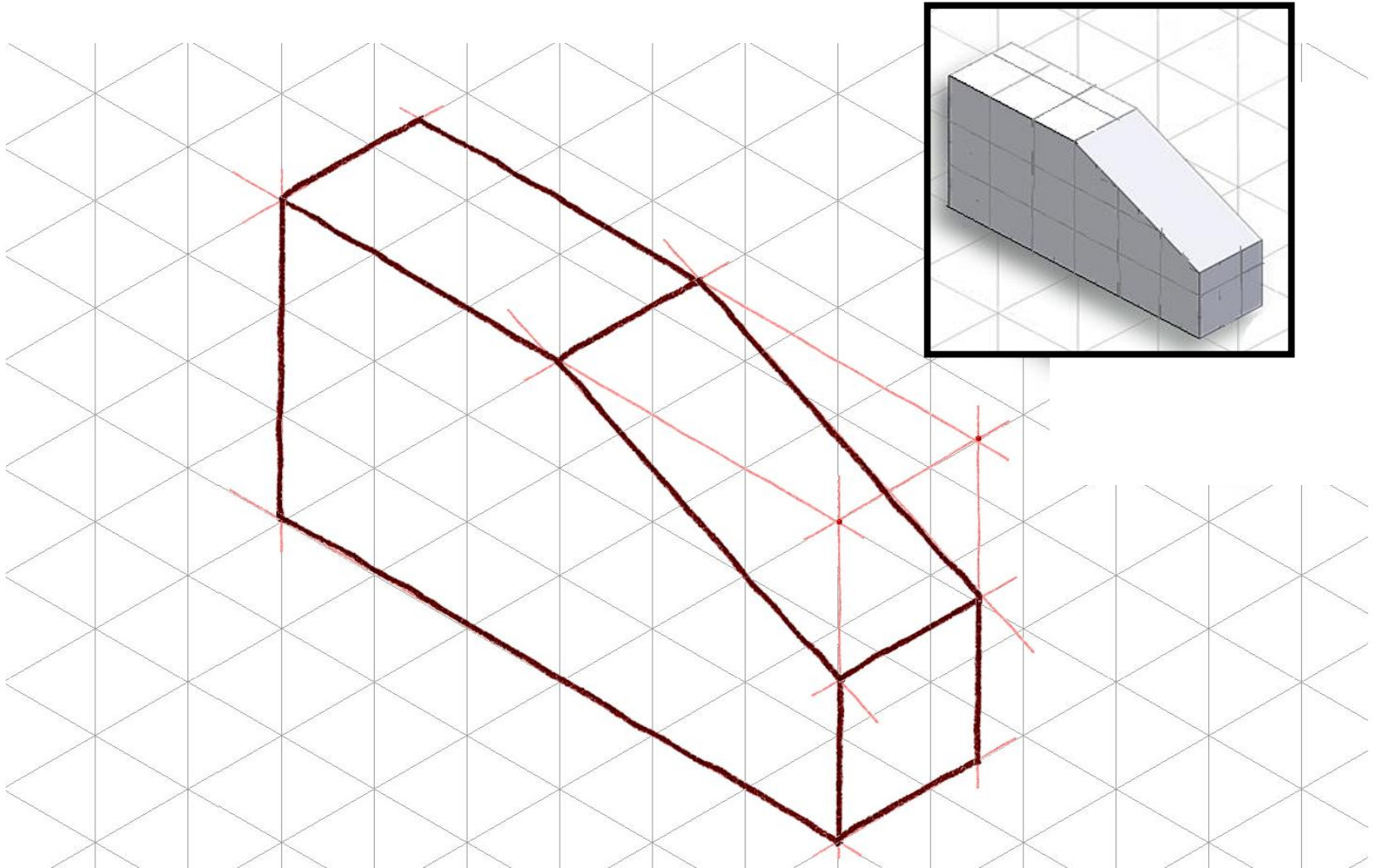
Step 2: Outside Faces

Use points and construction lines to identify corners and edges of object faces that occur on box surface



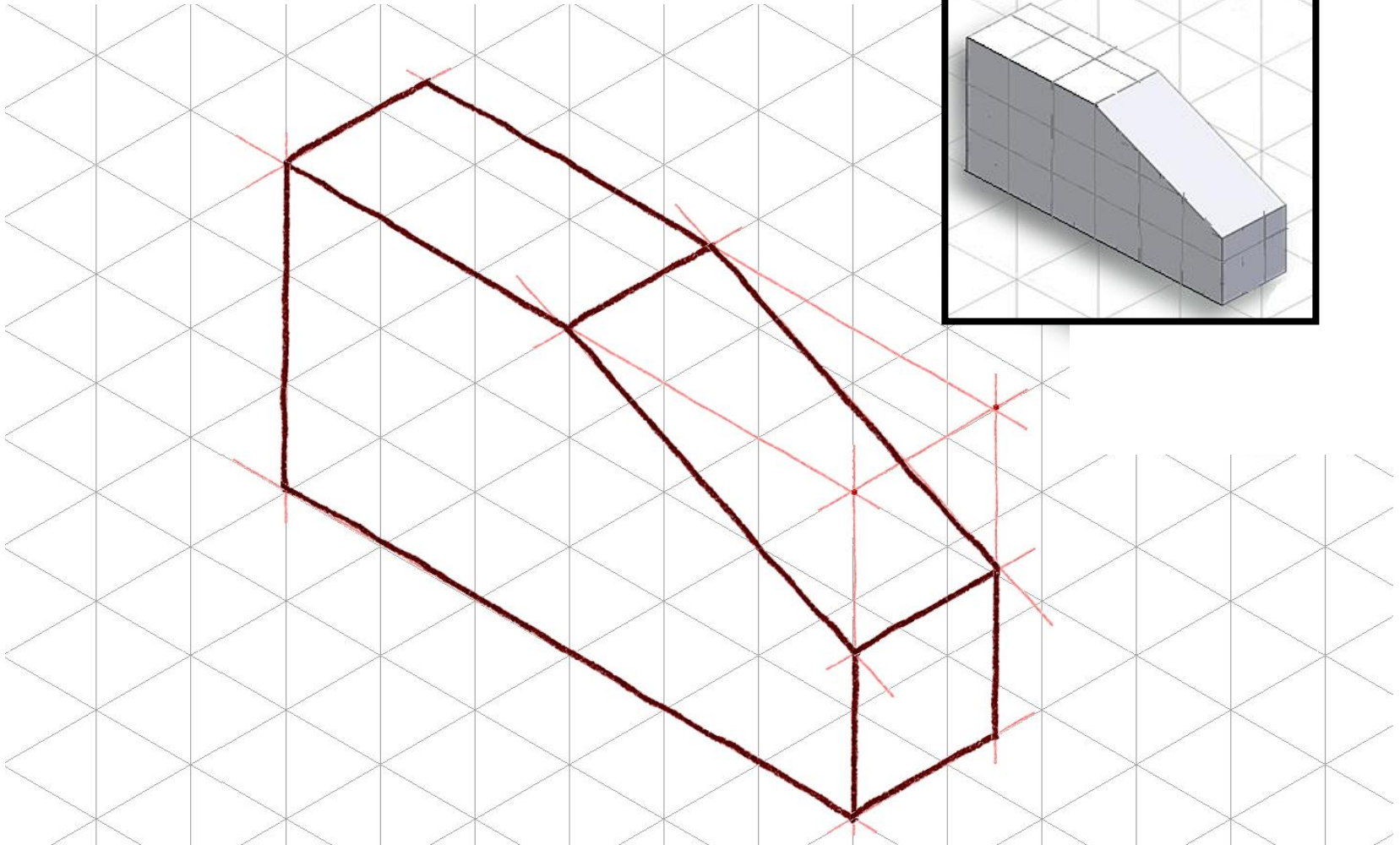
Step 2: Outside Faces (continued)

Trace visible edges of part with thick, dark object lines



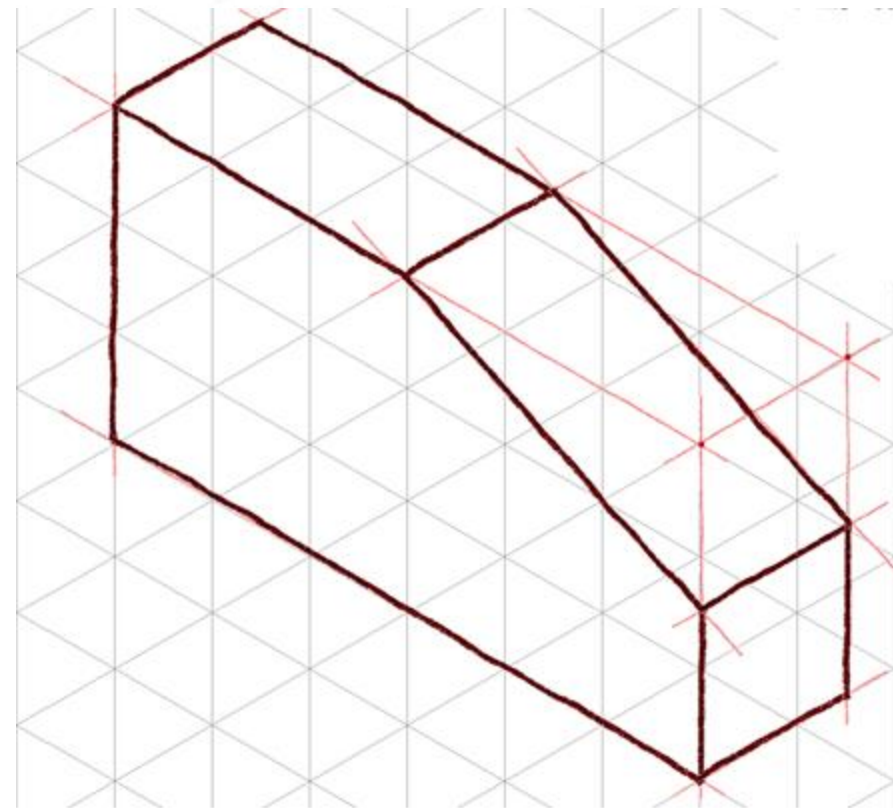
Step 3: Inside Faces

In this case, there are no inside faces



Step 4 - Tonal Shading

- Decide the light source position, and add tonal shading to two of the three faces
- A shading option is to use parallel lines drawn closely together on a face
- Increase contrast by cross-hatching lines on darkest face



EXAMPLE 2

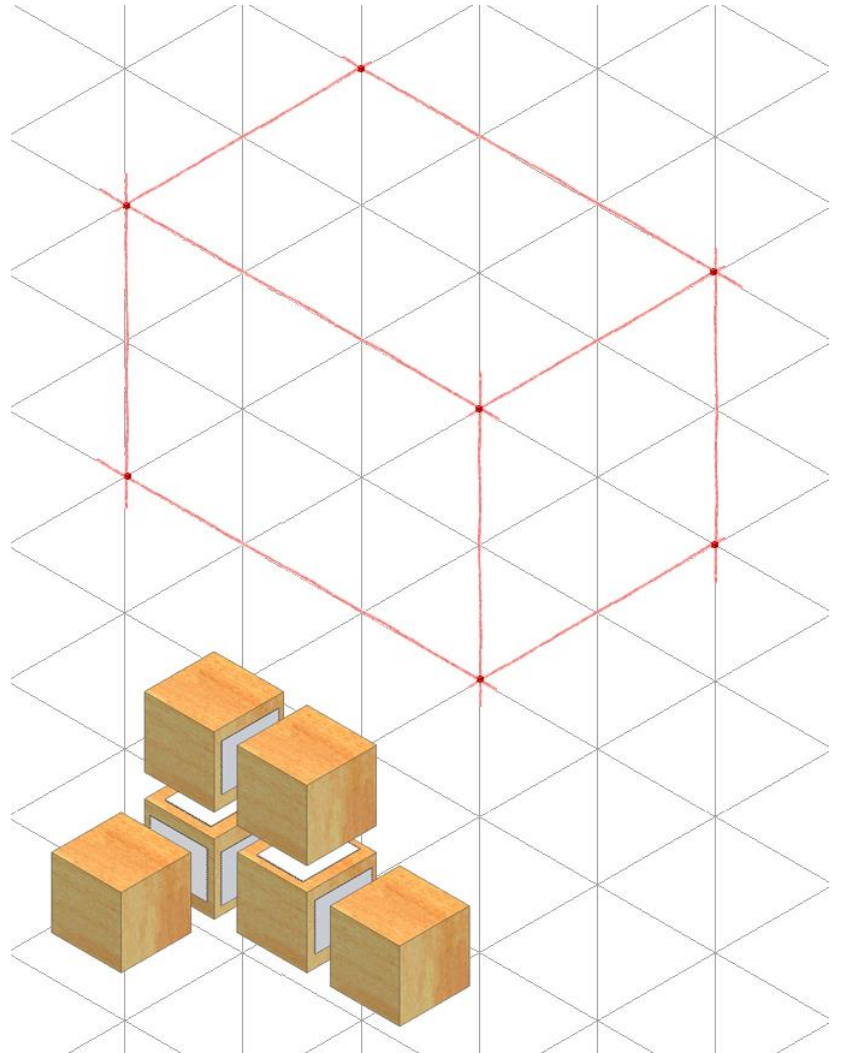
Isometric Sketch

Step 1: Constructing The Box

Determine the overall dimensions of the object:

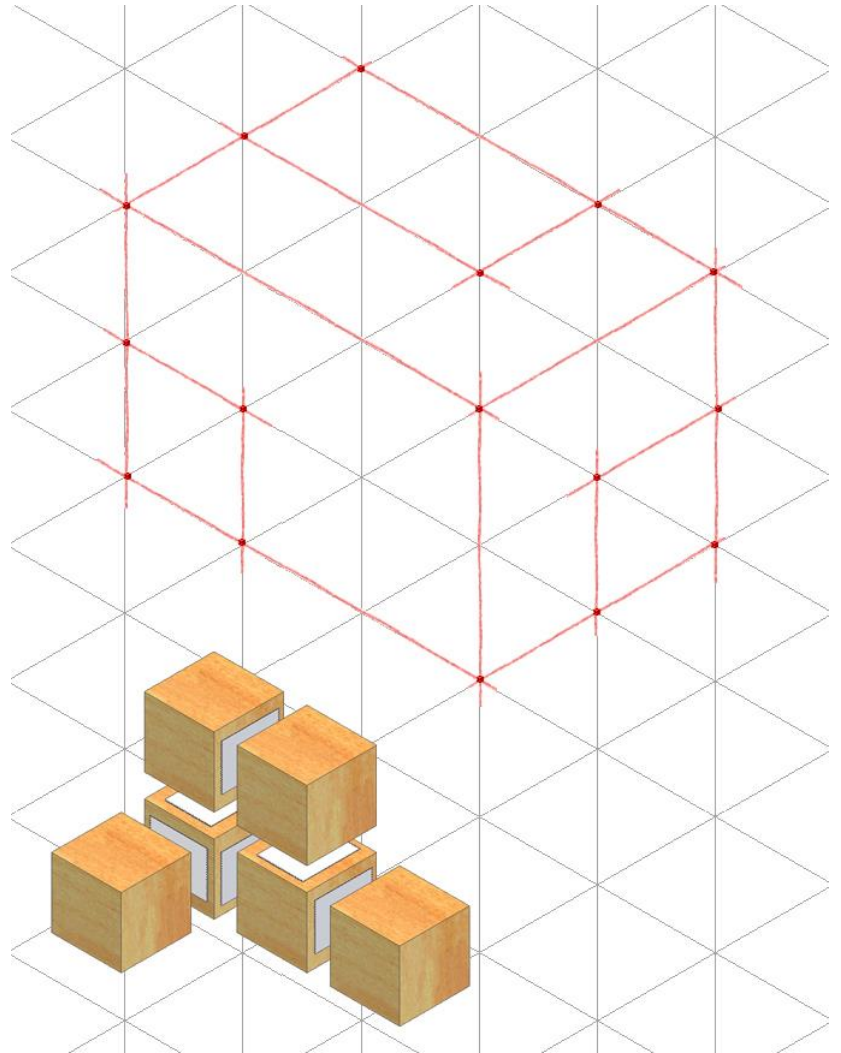
- 3 units wide
- 2 units tall
- 2 units deep

Use points and construction lines to layout the box.



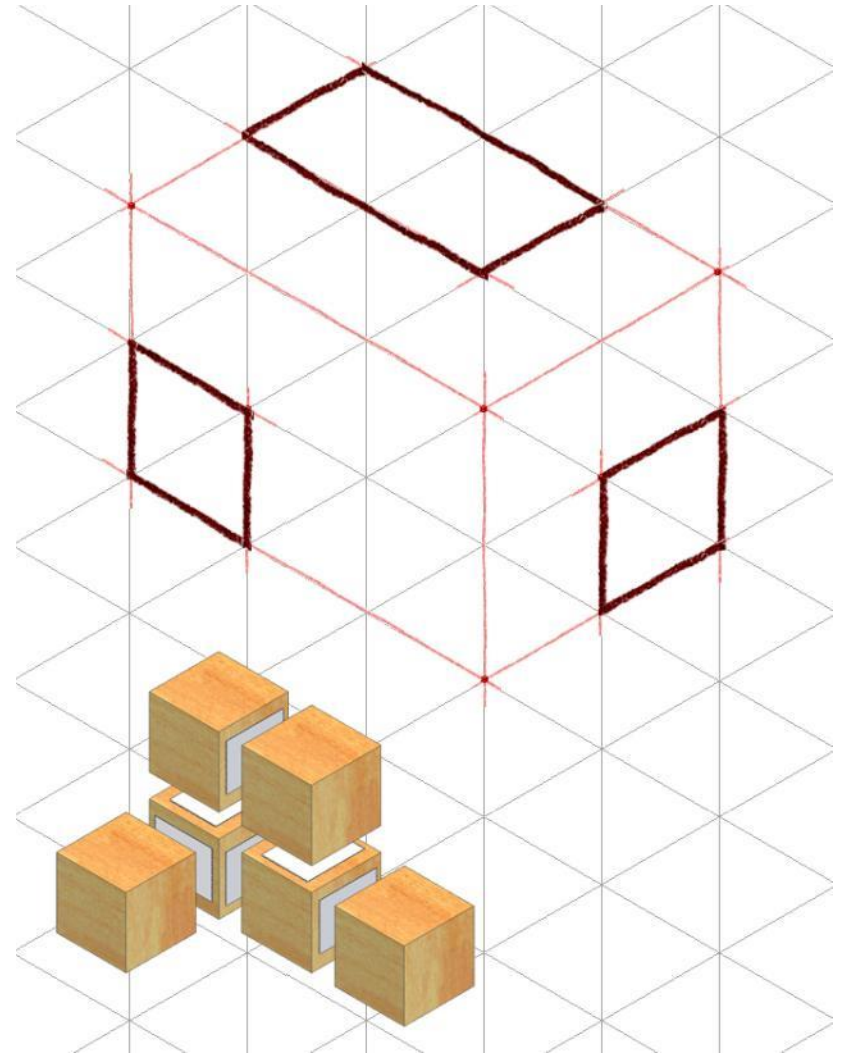
Step 2: Outside Faces

Use points and construction lines to identify corners and edges of object faces that occur on surface of the box



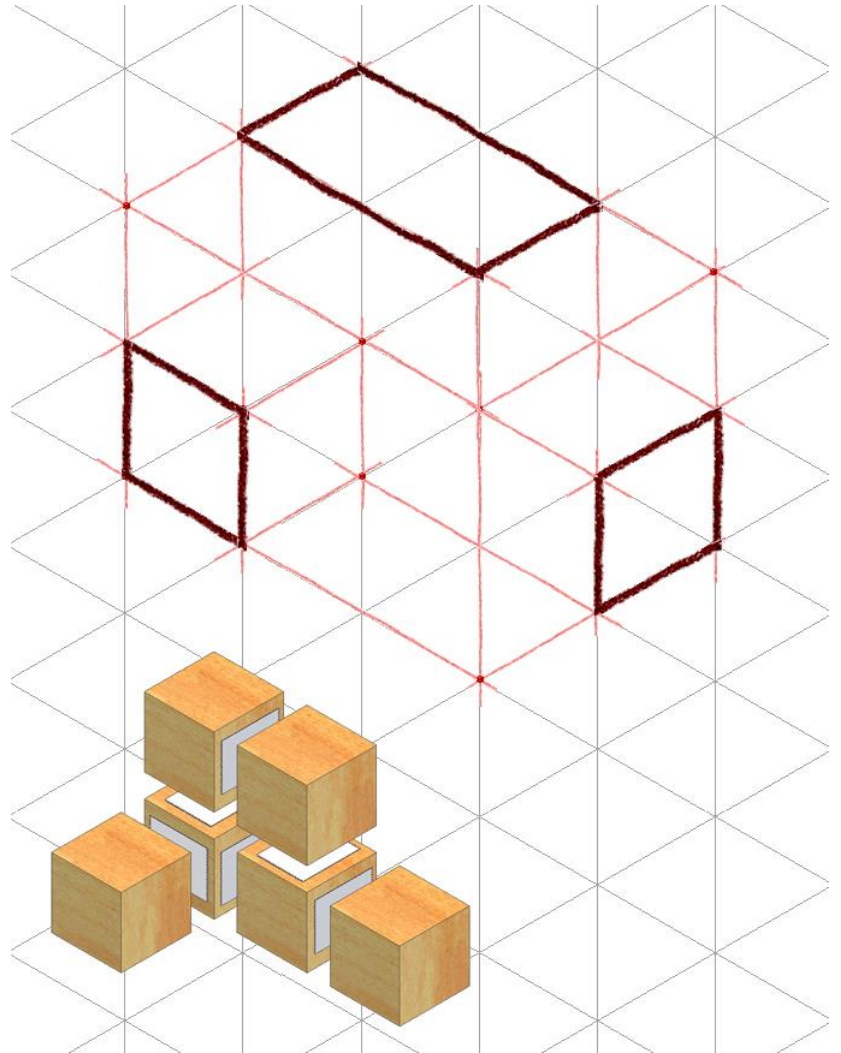
Step 2 – Outside Faces (continued)

Before sketch
becomes too
congested with
construction lines,
trace visible edges
with object lines



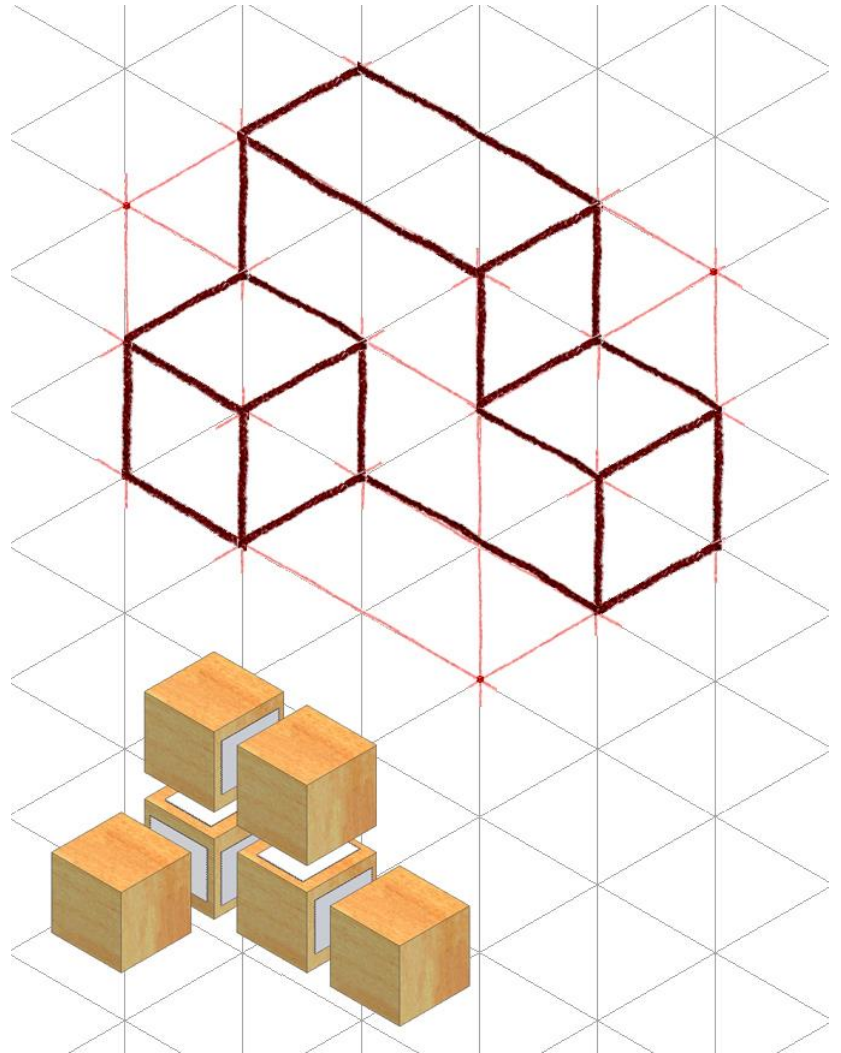
Step 3 - Inside Faces

Use points and construction lines to identify the corners and edges of the object faces that occur inside the box.



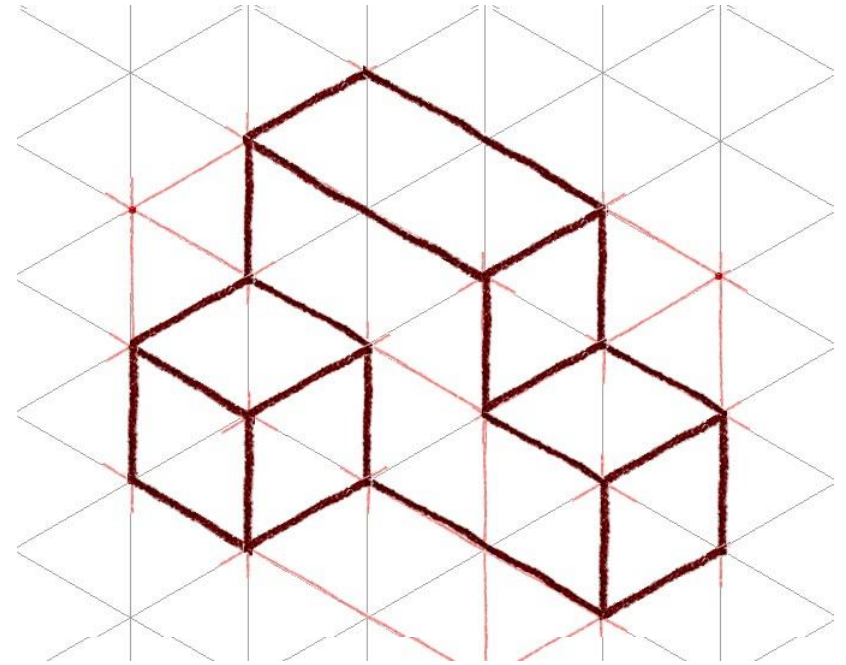
Step 3 - Inside Faces (continued)

Trace out remaining visible edges with object lines

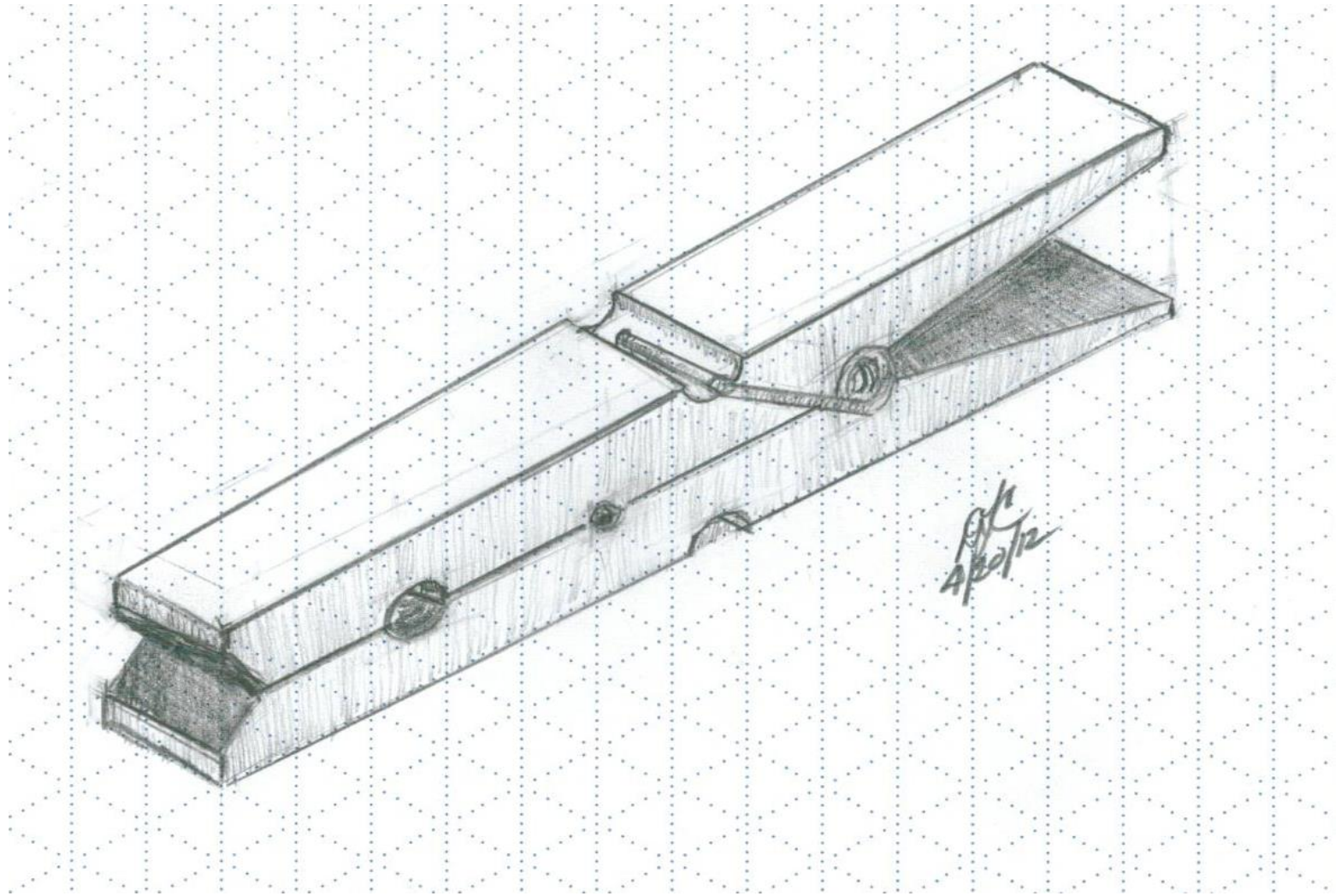


Step 4 - Tonal Shading

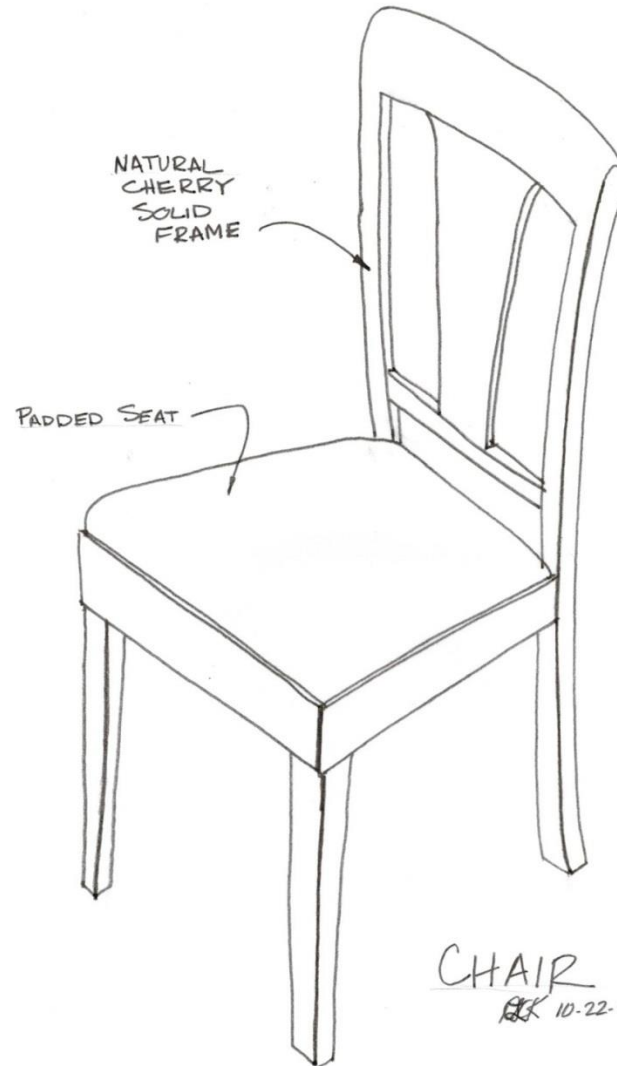
- Decide the light source position, and add tonal shading to two of the three faces
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- Increase contrast by cross-hatching lines on darkest face



Isometric Sketch Example

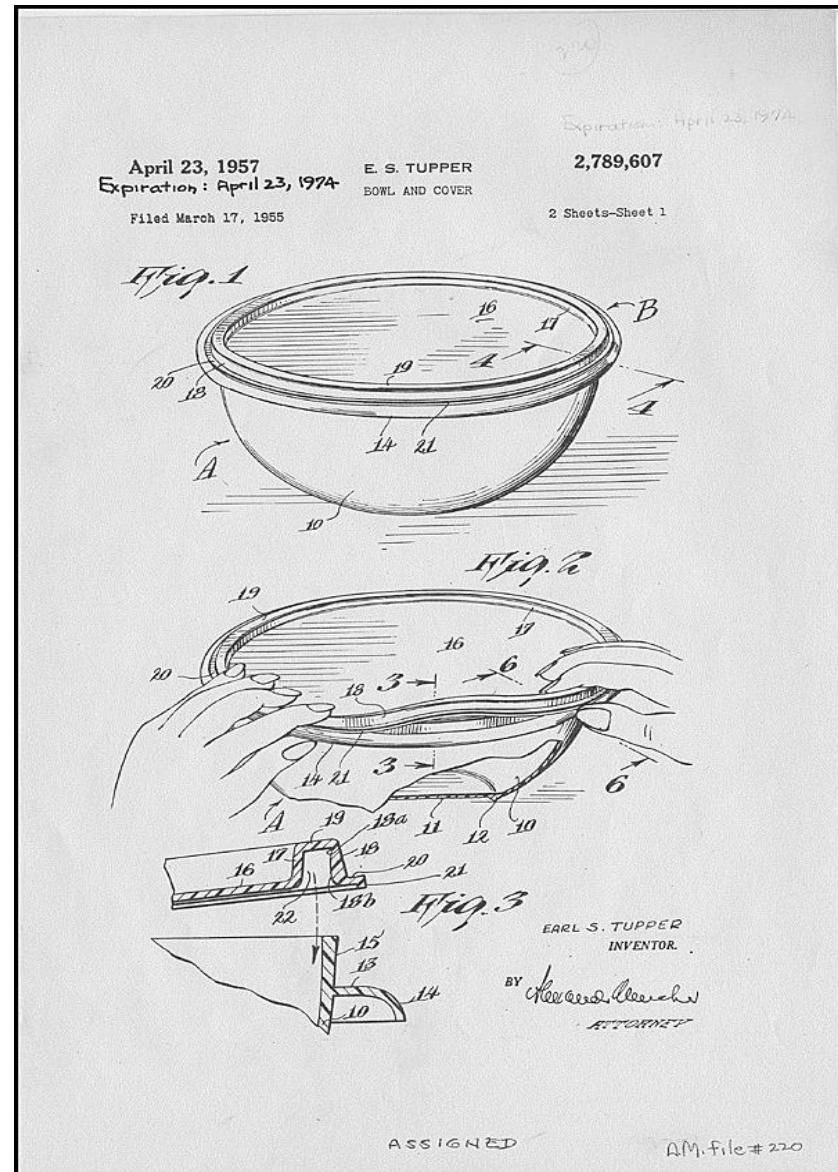


Isometric Sketch Example



Isometric Sketch Historical Example

- Earl Silas Tupper (1907 - 1983) invented an air-tight Tupper Seal in 1947
- Patent drawings of bowl and cover, 1957 (isometric pictorial)



Patent drawing of bowl and cover, 1957
Earl S. Tupper, Leominster, Massachusetts
printed ink on paper

Doodles, Drafts and Designs: Industrial Drawings from the Smithsonian



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

Courtesy Smithsonian Institute:
<http://sil.si.edu/exhibitions/doodles>

Isometric Drawing Activity

References

- Tupper, Earl Silas. Patent drawings, 1957. Smithsonian Institute:
<http://sil.si.edu.exhibitions/doodles>
- Wikipedia (2011). *Three point flexural test*. Retrieved from
<http://en.wikipedia.org/wiki/File:Threepoint.jpg>