Isometric and Oblique Pictorials
Pictorial Drawing

• 2D illustration of a 3D object
• Shows three faces of an object in one view
• Provides a realistic view of an object
• Three types
  – Isometric
  – Oblique
  – Perspective
Oblique Pictorials

• An *Oblique pictorial* starts with a straight-on view of one of the object’s faces, which is often the front face.

• Angled, parallel lines are drawn to one side to represent the object’s depth. Common oblique angles include 30°, 45°, and 60°.
Oblique Pictorials

• Two common types of oblique pictorials:
  – Cavalier
  – Cabinet

• The difference between the two is how the depth of the object is represented
Oblique Pictorials

Object appears deeper than it actually is

More realistic view because depth does not appear distorted

Cavalier Oblique

Cabinet Oblique
Oblique Pictorials

The following slides show the steps in creating oblique pictorials of the puzzle piece shown below.

Imagine a glass box that encloses the entire object.
1. Sketch a rectangle to represent the overall height and width of “the box” such that height lines are vertical and widths lines are horizontal. This will give a straight on view of the front of the object.
Oblique Pictorials

2. Complete “the box” by sketching depth lines to the overall depth of the object at a given angle (45 degrees here).

- Cavalier Oblique: drawn full depth
- Cabinet Oblique: drawn half depth
Oblique Pictorials

3. Sketch points and construction lines to identify the edges of the object faces that occur on the visible surfaces of "the box".

Cavalier Oblique
- Cavalier is full depth

Cabinet Oblique
- Cabinet is half depth
Oblique Pictorials

3. Sketch points and construction lines to identify the edges of the object faces that occur on the visible surfaces of “the box”.

**Cavalier Oblique**
- Cavalier is full depth

**Cabinet Oblique**
- Cabinet is half depth
3. Sketch points and construction lines to identify the edges of the object faces that occur on the visible surfaces of “the box”.

Cavalier Oblique

Cabinet Oblique

Cavalier is full depth

Cabinet is half depth
4. Use object lines to trace over the construction lines to delineate the edges of the object faces that occur on the visible surfaces of “the box”.

Cavalier Oblique

Cabinet is half depth

Cavalier is full depth

Cabinet Oblique
Oblique Pictorials

5. Sketch additional construction lines to identify edges of the object inside of the box.
6. Trace over construction lines with object lines to delineate the remaining object lines.
Create the Oblique Cabinet view.

Cavalier is full depth

Cabinet is half depth

Cavalier Oblique

Cabinet Oblique
Oblique Pictorials

7. You may use tonal shading to enhance the appearance of the perspective sketch and create a more realistic representation.
Oblique Pictorials

- Examples

Interlocking pavement concept

Game system controller
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

Best shape Description

No hidden edges

Most natural position

Longest Dimension

BEST FRONT VIEW
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
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
• A shading option is to use parallel lines drawn closely together on a face
• 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)

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