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

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.

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

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
  - Cavalier is full depth

- Cabinet Oblique
  - Cabinet is half depth
Oblique Pictorials

5. Sketch additional construction lines to identify edges of the object inside of the box.

Cavalier Oblique
Cabinet Oblique

6. Trace over construction lines with object lines to delineate the remaining object lines.

Cavalier Oblique
Cabinet Oblique

Oblique Pictorials

Create the Oblique Cabinet view.

Cavalier Oblique
Cabinet Oblique

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

Cavalier Oblique
Cabinet Oblique
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

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)

References