

# Depth

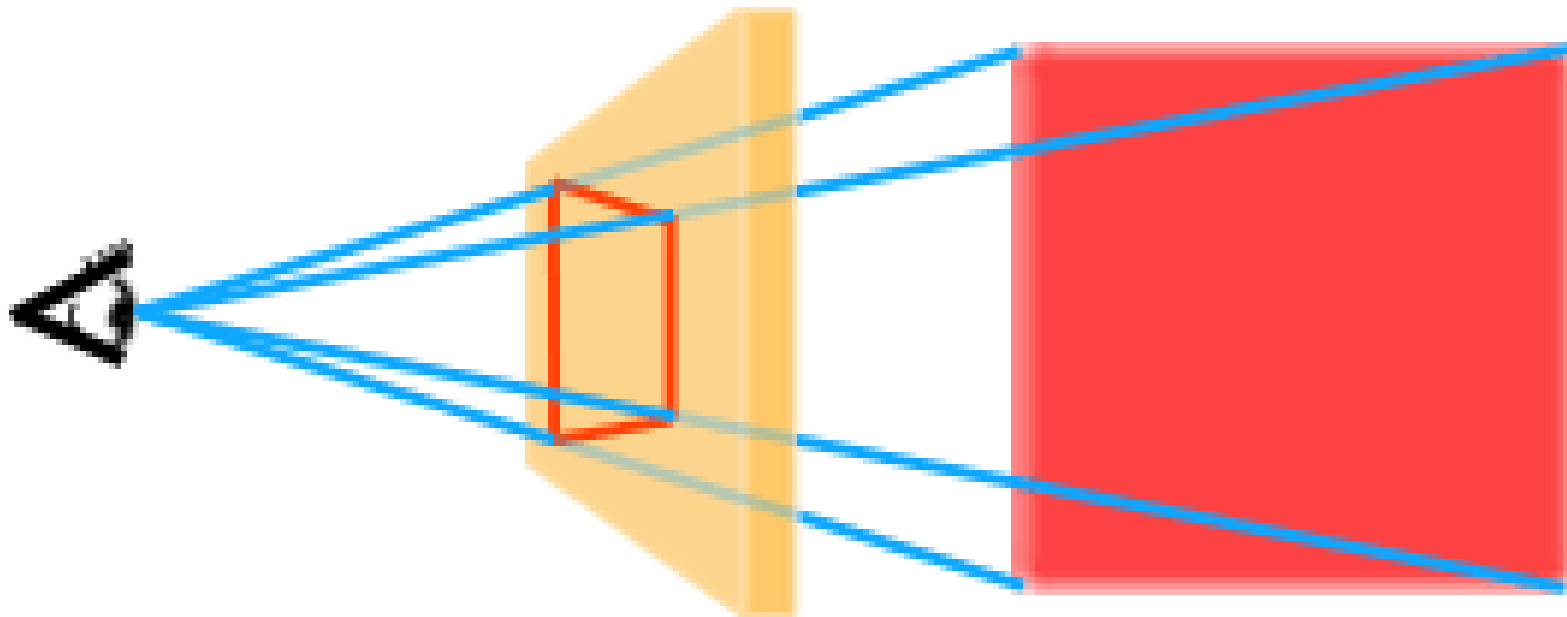
- How to represent a three dimensional scene in a two dimensional image?

# Depth

- Overlap
- Height of ground
- Size
- Shading (Chiaroscuro)
- Detail
- Color
- Vanishing points – linear perspective

# Linear Perspective

- Picture plane between eye and scene.
- Visual pyramid.



# Leonardo's Window

- View a scene through a window with one eye closed and head steady.
- Trace scene onto clear plastic taped to the window
- Alternately, viewer directs helpers to attach masking tape to the window along lines of scene.

# Vanishing Points

- Every receding set of parallel lines in the scene converges to a unique vanishing point in the picture plane.
- Horizontal lines in the scene have vanishing points on a horizontal line in the picture plane, the “horizon”.
- The horizon establishes eye level.

# Vertical Lines

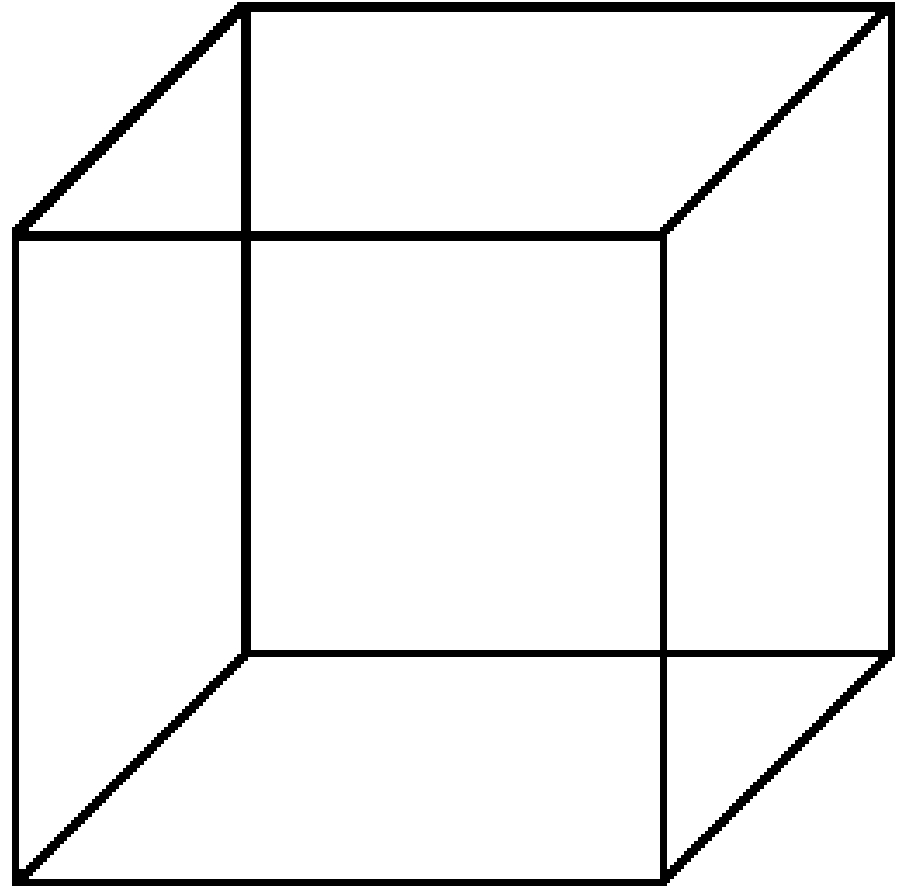
- Vertical lines in the scene may converge.
- Viewer looking up – verticals converge upwards to a **zenith**.
- Viewer looking down – verticals converge downwards to a **nadir**.

# Student Questions

- What techniques are used to give depth in ...
- Find the horizon line and vanishing points
- Draw a block in 1, 2, 3 point perspective.
- Be specific:
  - In house of stairs, find one curl-up who thinks this vanishing point is a zenith, one who thinks it is a nadir, one who thinks it is on the horizon.

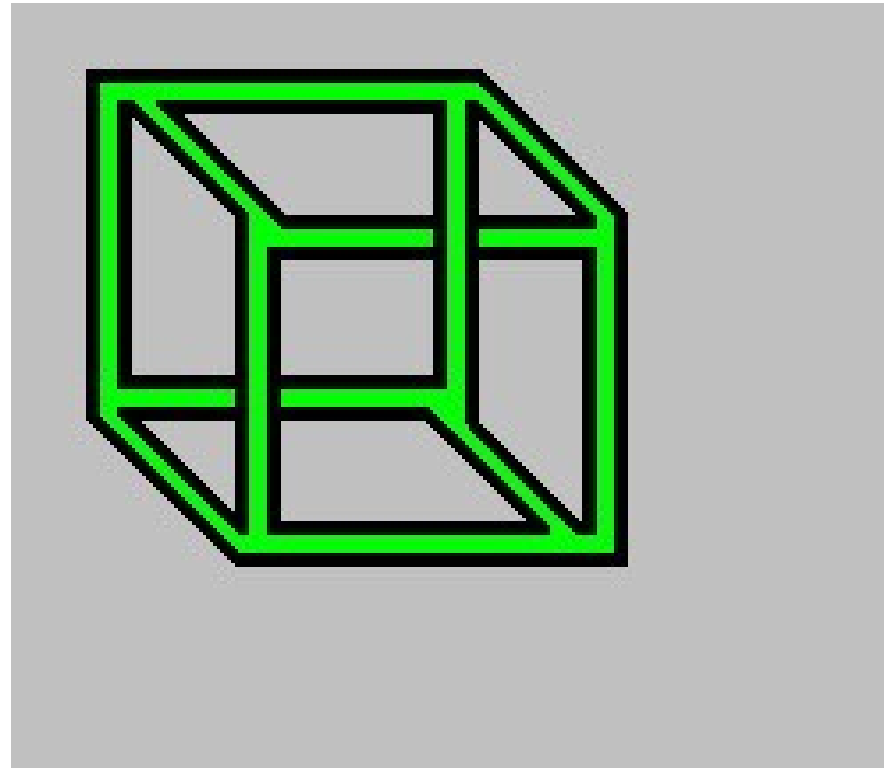
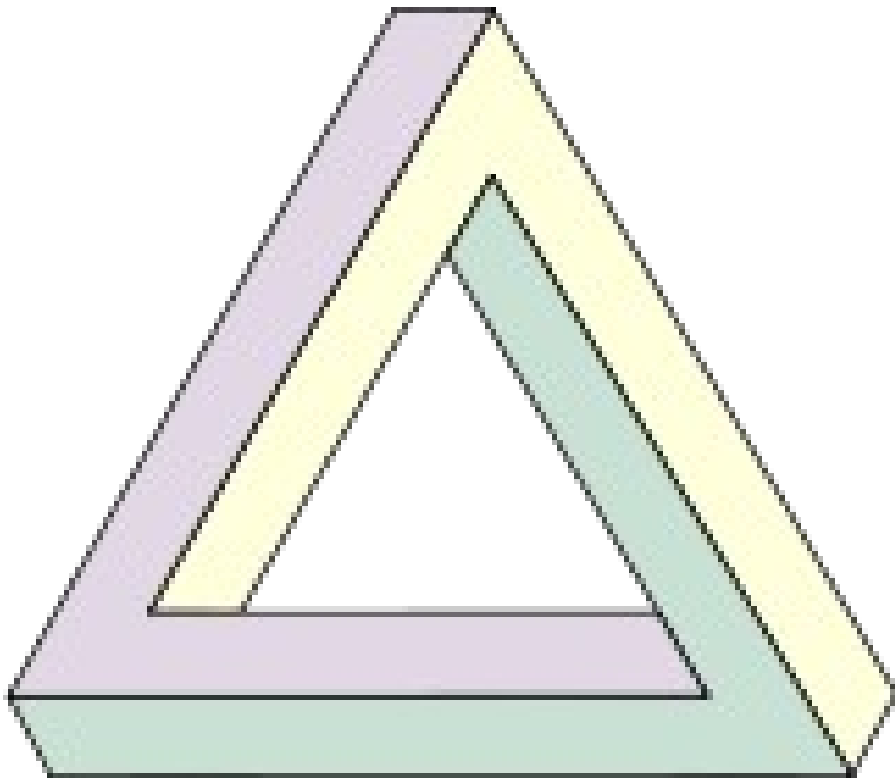
# Ambiguity

- 2D picture cannot unambiguously represent a 3D scene.
- Necker Cube (Louis Necker, 1832)



# Impossibility

- Penrose Triangle (1958), Impossible Cube



# Student Work

- Identify ambiguities
- Draw impossible figures
- Identify impossibilities
- Be specific
  - There are two trumpeters in Convex and Concave. Describe what would happen to each of them if they both jumped out their window.
- Goal: Have students look critically at art.

# Art is Illusion

- Mind reconstructs 3D scene from 2D picture.
- Escher forces the viewer to acknowledge that.
- Rene Magritte (1898-1967) Belgian surrealist.

# Onward

- Optical illusions and the Op Art movement.
- Fourth Dimension