

SOLIDS

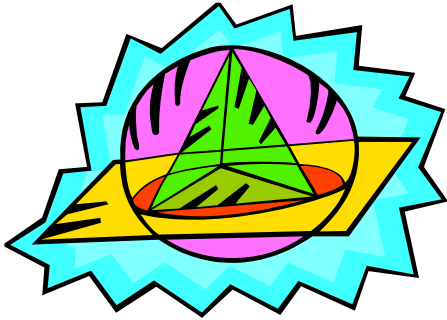
VISUALIZING GEOMETRIC MODELS

There are lots of interesting three-dimensional (3-D) shapes to study in mathematics. These shapes are the fundamental shapes of many objects you find around you, both naturally and man-made. We'll begin by looking some 3-D shapes which can be referred to as solids.

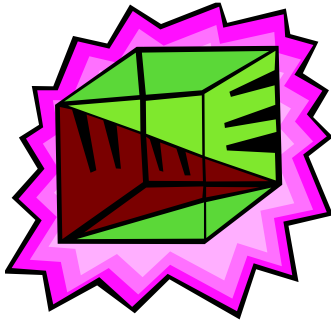
Then we'll take a closer look at prisms. Prisms are named by the shape of their bases. A rectangular prism has six faces, twelve edges, and 8 vertices.

Three-dimensional objects look differently from different views. We'll examine a shape built out of cubes and see how differently it looks from a top view, side view, and back view. We will use isometric dot paper to sketch 3-D objects.

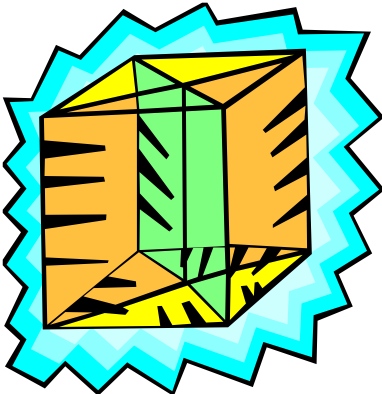
Solids



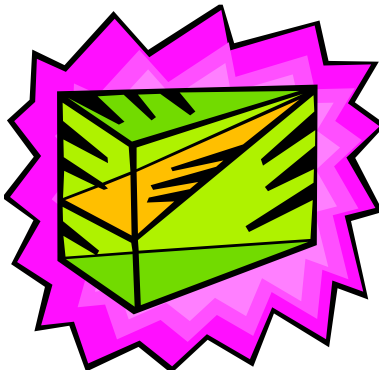
A **sphere** is one continuous curved surface where all of its points are the same distance from a center point within the sphere.



A **cube** is a rectangular prism where all sides are congruent.



This box is shaped like a **rectangular prism**. A rectangular prism has six rectangular faces that meet at right angles.

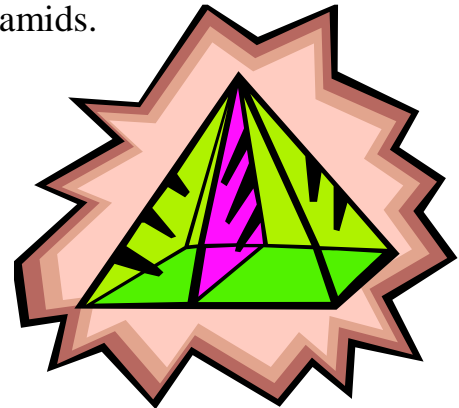


A **triangular prism** has triangles for bases and three rectangular sides.



A **cylinder** has two circular bases and a curved surface.

A **pyramid** has a polygon for its base and triangles for its sides which meet at one vertex. The ancient Egyptians built many pyramids.

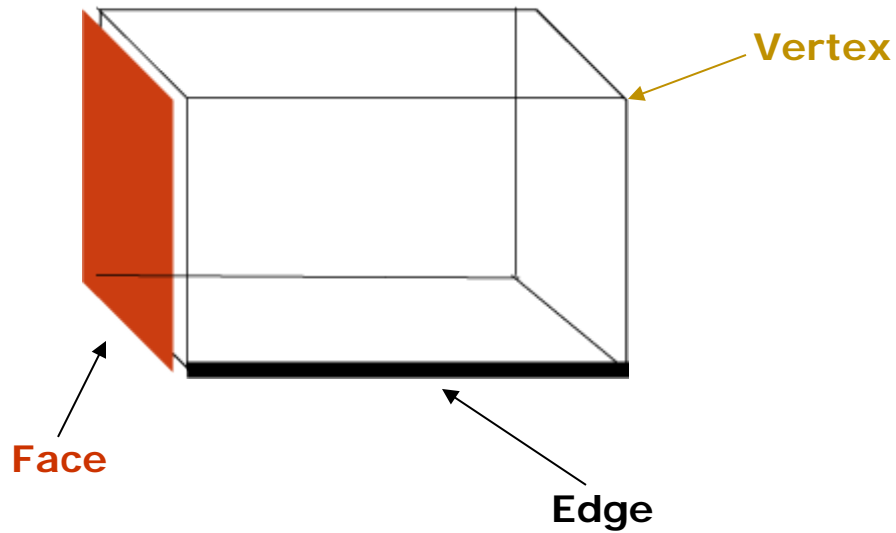


A **cone** has a curved surface, a circular base, and one vertex.



Prisms

A rectangular prism has **6 faces**, **12 edges**, and **8 vertices**.



Face – the flat surface of a three-dimensional figure

Edge – the line segment formed where two faces intersect

Vertex – the point where the edges of a three-dimensional figure intersect

Three Dimensional Cube Models



Here is a structure built out of candle cubes.

Do you see all 12 cubes? There are six cubes on the bottom layer, 4 cubes in the middle layer, and 2 cubes on the top layer.

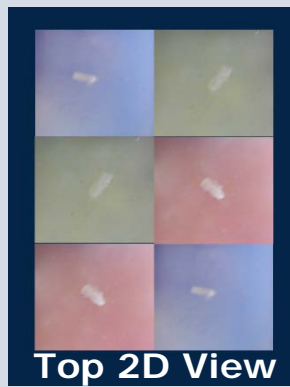
A 3-D (dimensional) structure has six 2-D views.

The six sides are top, bottom, two sides, front, and back.

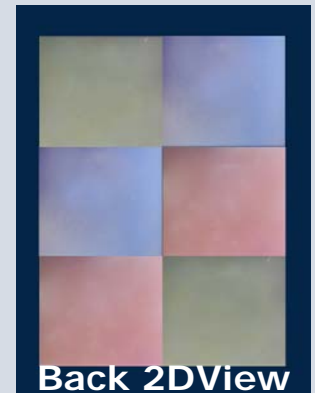
When you stand far enough back and are viewing one face of the structure, that face appears to be two dimensional.

Below are three of the six views of the structure including an actual picture of the face, then the 2-D view of the face.

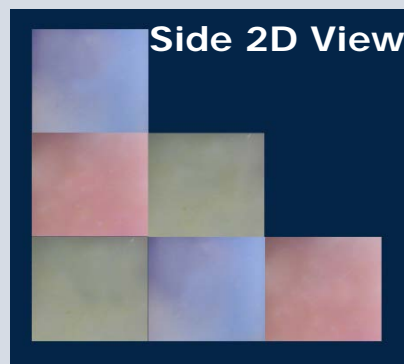
Top



Back



Side



Isometric Dot Paper

