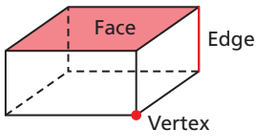
Section Overview

Professional Development

Solid Geometry — Lesson 10-1

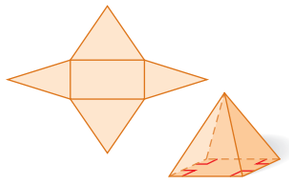
Why? Nets and cross sections of three-dimensional figures can be used to create models and find surface areas.

Three-dimensional figures can be made up of flat or curved surfaces.

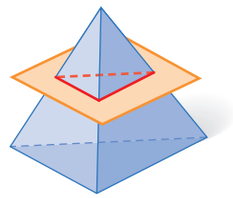


A flat surface is called a **face.** An **edge** is the intersection of two faces. A **vertex** is the intersection of three or more faces.

A **net** is a diagram of the surfaces of a three-dimensional figure that can be folded to form the three-dimensional figure.



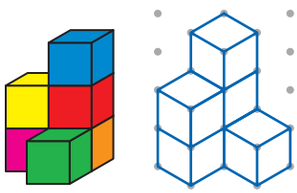
A **cross section** is the intersection of a three-dimensional figure and a plane.



Representations of Three-Dimensional Figures — Lesson 10-2

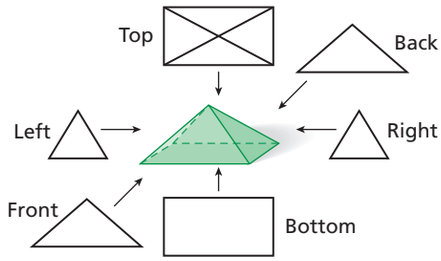
Why? Architects use drawings of three-dimensional figures to represent plans for buildings.

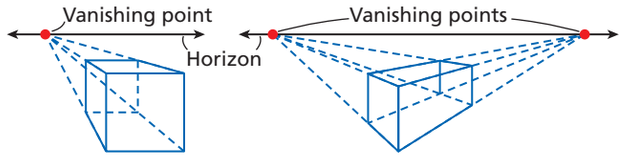
An **isometric drawing** shows a corner view of a figure.



A **perspective drawing** shows parallel lines drawn such that they meet at a vanishing point.

An **orthographic drawing** shows six different views of an object.





One-Point Perspective **Two-Point Perspective**

Formulas in Three Dimensions — Lesson 10-3

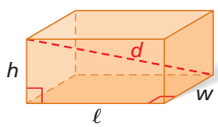
Why? A three-dimensional coordinate system can be used to find distances between points in a three-dimensional space.

Euler's Formula

For any polyhedron with V vertices, E edges, and F faces, $V - E + F = 2$.

Diagonal of a Right Rectangular Prism

$$d = \sqrt{\ell^2 + w^2 + h^2}$$



Distance and Midpoint Formulas for Three Dimensions

Distance between (x_1, y_1, z_1) and (x_2, y_2, z_2):

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

Midpoint between (x_1, y_1, z_1) and (x_2, y_2, z_2):

$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}, \frac{z_1 + z_2}{2}\right)$$