

LESSON
10-2

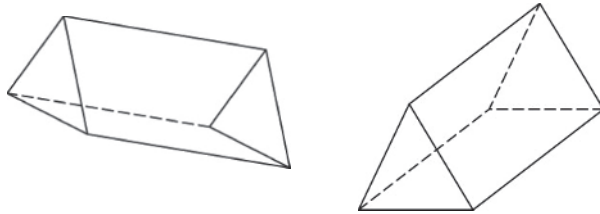
Volume of Triangular Prisms and Pyramids

Reteach

The volume formulas for triangular prisms and pyramids are similar in that both calculate volume as a product of an area and a distance.

Triangular Prisms

Triangular prisms have two congruent triangular bases that are parallel as shown.



- Each side of the triangular base is also one of the two parallel sides of the three parallelograms or rectangles that form the **faces** of the prism.
- The **height** of the triangular prism is the distance between the two triangular bases, which is also the length of one of the parallel sides of the faces.

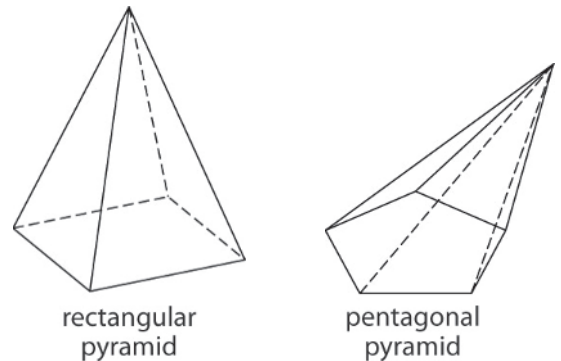
The faces can be parallelograms or rectangles. Either shape has two pair of sides that are congruent, opposite, and parallel. Congruency means the length, or height, will be the same along any side of the face that is not a side of the base.

The area of the base times the height gives the volume.

$V = B \times h$, where B is the area of one of the triangular bases.

Pyramids

Pyramids are named by the shapes of their bases



- The **faces** of the pyramid are all triangles, but they may or may not be congruent. The **vertices** of the triangular faces converge to a point, called the **vertex**.
- The **height** of a pyramid is the perpendicular distance between the vertex and the plane of the base.

The height may intersect the plane of the base *outside* the perimeter of the base as shown in the right figure.

The volume is the product of the area of the base times the height, *multiplied by one third*. The decreasing volume from the base to the vertex requires the one third.

$$V = \frac{1}{3} \times B \times h, \text{ where } B \text{ is the base area.}$$

Find the missing measurements.

1. The volume of a prism is 20 cubic inches. Its length is 4 inches. What is its base area?

2. The base area of a pyramid is 200 square meters. Its height is 6 meters. What is its volume?
