



## 8 - Measurement Relationships

### 8.3 - Surface Area and Volume of Pyramids and Prisms



**Surface Area** - the number of square units required to cover the surface of a 3-D object (ie how much wrapping paper 😊)

**Volume** - the amount of space that an object occupies, in cubic units

**Prism** - a 3-D object with **two parallel and congruent polygon faces**. The prism is named for its faces: square-based prism, triangular-based prism etc.

**Pyramid** - a 3-D object whose base is a polygon, and whose other faces **meet at a common vertex**. It is named for the shape of it's base: rectangular-based pyramid etc.

**How do we calculate SA and V?:**

**Surface area of a prism:** area of the face x 2 + area of each rectangular side

**Surface area of a pyramid:** area of the base + area of each triangular face

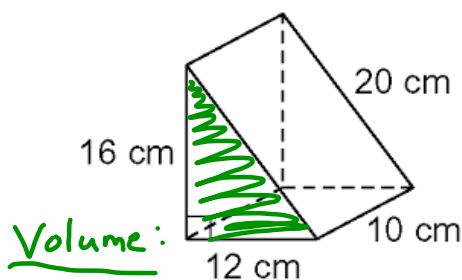
**Volume of a prism:** area of the face x the height of the prism

**Volume of a pyramid:**  $\frac{\text{area of the base} \times \text{height of the pyramid}^*}{3}$

\*(be careful! Height of the pyramid is NOT the same as the height of the triangles)

**One more thing!**

Liters are another unit for volume; **1 L = 1000 cm<sup>3</sup>** and **1 ml = 1 cm<sup>3</sup>**

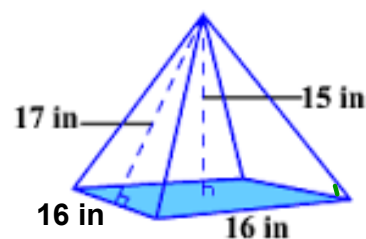


Volume:

$$\begin{aligned} \text{Area } \Delta &= \frac{bh}{2} \\ &= \frac{12 \times 16}{2} \\ &= 96 \end{aligned}$$

$$\text{height} = 10$$

$$\begin{aligned} V &= 96 \times 10 \\ &= 960 \text{ cm}^3 \end{aligned}$$



$$\begin{aligned} \text{Volume} &= \frac{\text{A}_{\text{base}} \times \text{height}}{3} \\ &= \frac{16 \times 16 \times 15}{3} \\ &= 1280 \text{ in}^3 \end{aligned}$$



Practice:

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