Volume of Rectangular Prisms

Right Prisms

- A right prism is a geometric solid that has a polygon as its base and vertical sides perpendicular to the base. The base and top surface are the same shape and size.

- Polygon – Many sided shape (octagon, hexagon…)

- Click on the link to see some examples of different types of right prisms
  - http://www.learner.org/interactives/geometry/3d_prisms.html

VOLUME

VOLUME is the amount of liquid or solid that will ***FILL*** a 3-Dimensional object!

**Always measured in units cubed (u^3)*

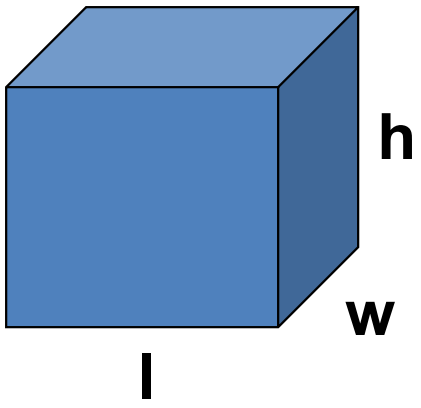
QUICK DEFINITION

- ***3-Dimensional*** objects are NOT FLAT.
- They have 3 measurements:
  - ***Length***
  - ***Width***
  - ***Height***

What Does Volume Mean?

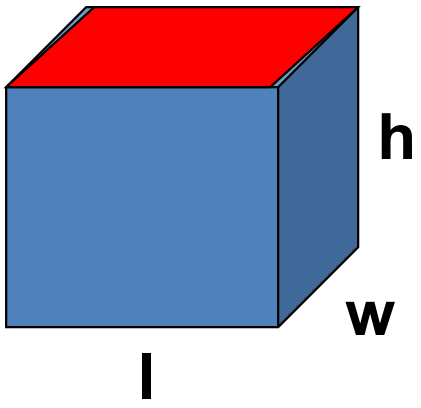
- Click on the link to explore the concept of volume
  - http://www.learner.org/interactives/geometry/area_volume.html

- **Volume – the amount of space occupied by an object.**



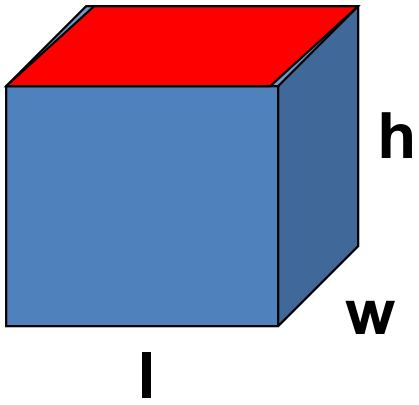
Example:
The VOLUME of this cube is all the space contained by the sides of the cube, measured in cube units (units^3).

- **Volume – To calculate the volume of a prism, we first need to calculate the area of the BASE of the prism.**



Example: The AREA of the base of this rectangular prism is l x w.

- **Volume – Once we know the area of the base, this is then multiplied by the height to determine the VOLUME of the prism.**



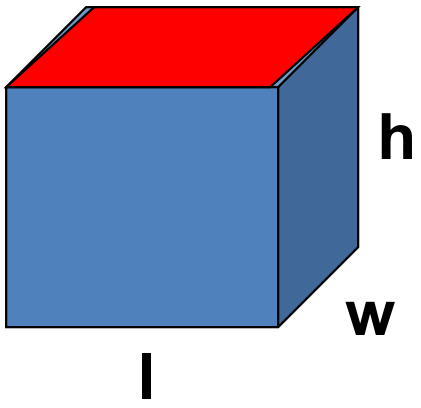
We find that:

Volume = Area of Base x Height

Volume = (l x w) x h

*Pro tip: Don't just multiply all the numbers together. Find the area of the base and multiply by the height. This will make finding the volume of other prisms much easier if you learn this way.

- **Volume (rectangular prism)**

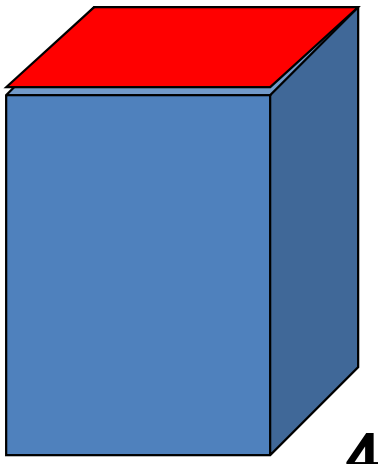


Formula:

$$V = B \times h$$

$$V = l \times w \times h$$

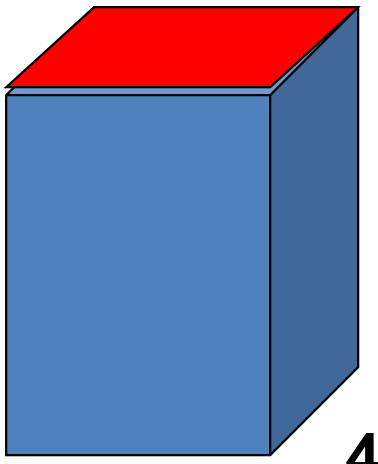
- **Find the volume of this prism…**



Formula:

$$V = B \times h$$
$$V = l \times w \times h$$

- **Find the volume of this prism…**



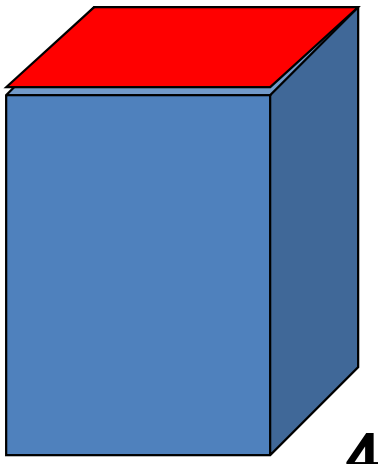
Formula:

$$V = B \times h$$

$$V = l \times w \times h$$

$$V = 5cm \times 4cm \times 7cm$$

- **Find the volume of this prism…**



Formula:

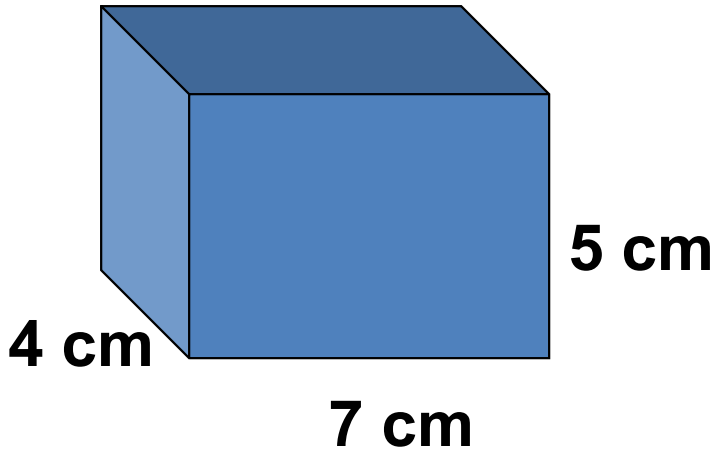
$$V = B \times h$$

$$V = l \times w \times h$$

$$V = 5cm \times 4cm \times 7cm$$

$$V = 140cm^3$$

- **Does it matter which side is the base?**



Formula:

$$V = B \times h$$

$$V = l \times w \times h$$

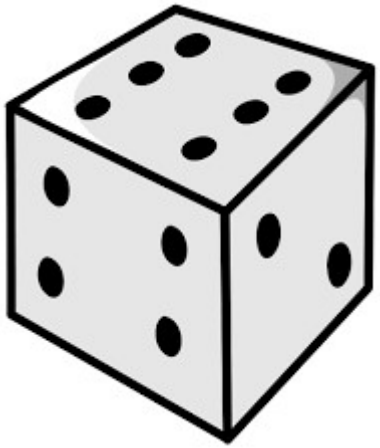
$$V = 7cm \times 4cm \times 5cm$$

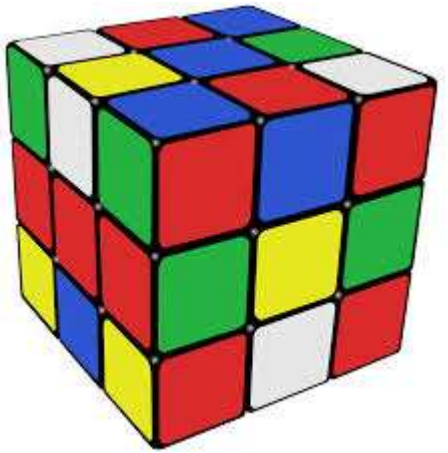
RECTANGULAR PRISM

- ***A RECTANGULAR PRISM***, is a solid figure that has **six** faces that are all **rectangles**. Opposite faces are congruent and parallel.

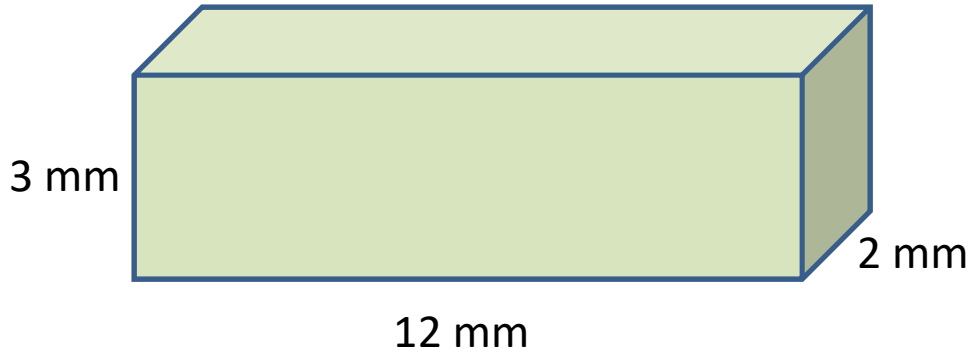
Cube

- ***A CUBE***, is a solid figure that has **six** faces that are all **squares**. All faces are congruent and parallel. This shape is classified as a rectangular prism because all squares are technically rectangles

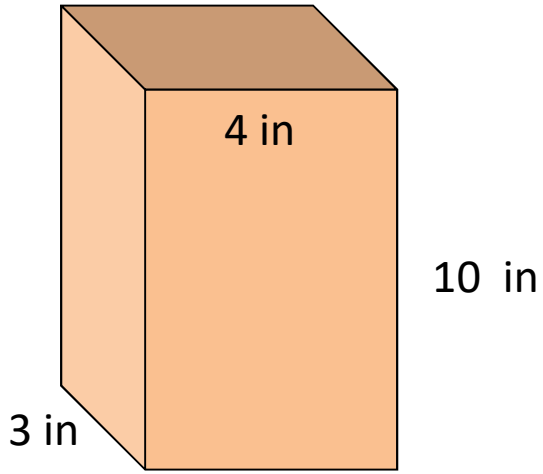




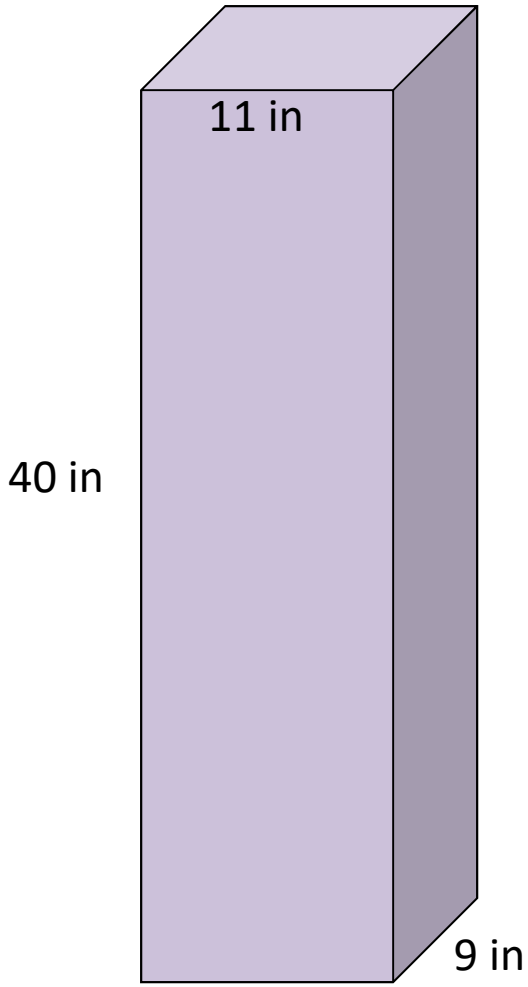
FIND THE VOLUME OF THIS RECTANGULAR PRISM:



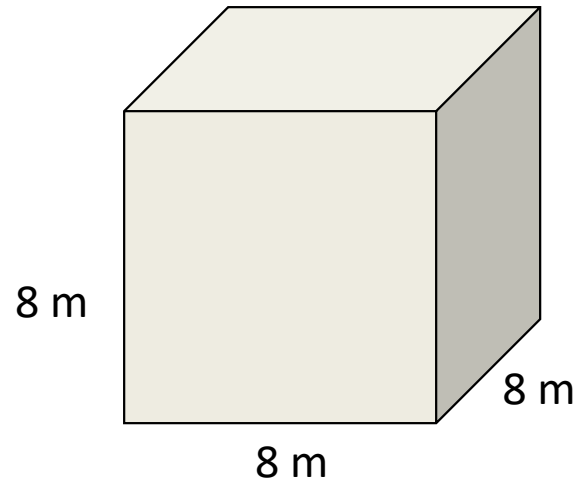
FIND THE VOLUME OF THIS RECTANGULAR PRISM:



FIND THE VOLUME OF THIS RECTANGULAR PRISM:



FIND THE VOLUME OF THIS RECTANGULAR PRISM:



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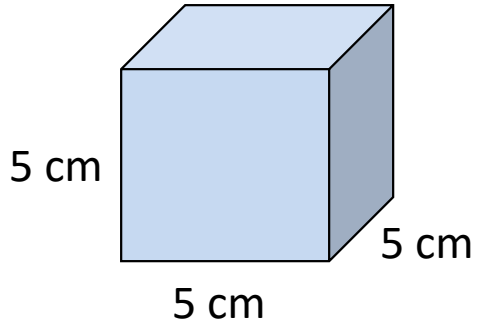

A cereal box has a length of 8 inches, a width of 1.75 inches, and a height of 12.125 inches? How much cereal will the box hold?

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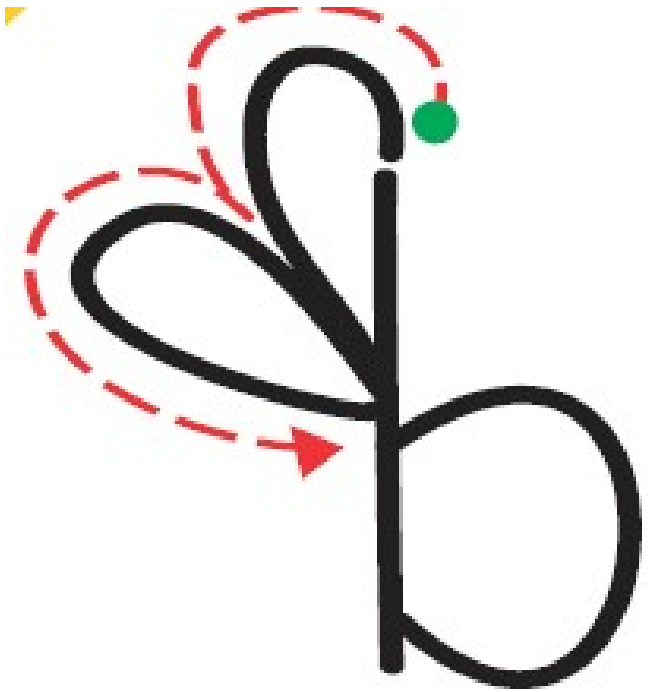

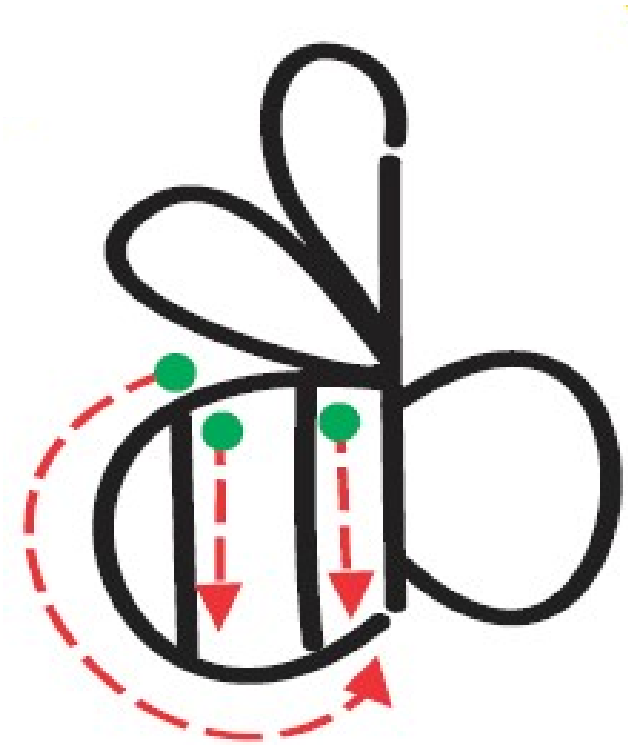

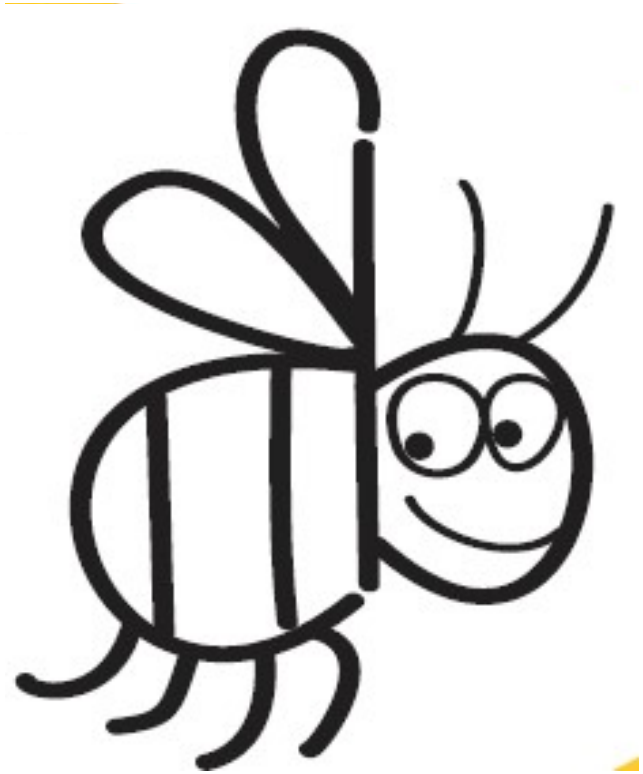

Alexia's bathroom has a tub in the shape of a rectangular prism with a length of 1.5 meters, a width of 0.5 meter, and a height of 0.4 meter. How many cubic meters of water can it hold?

Trailers that travel on the road behind trucks are rectangular prisms. A typical height for the inside of these trailers is 108 inches. If the trailer is 8 ft wide and 20 ft long, what is the volume of the trailer?

Hint: Make sure you are using the same units. 1ft = 12in

An aquarium shaped like a rectangular prism has a length of 120 centimeters, a width of 60 centimeters, and a height of 100 centimeters. How much water is needed to fill the aquarium?

A rectangular prism has a length of 2 inches, a height of 5 inches, and a width of 3 inches. What is the volume of this rectangular prism?