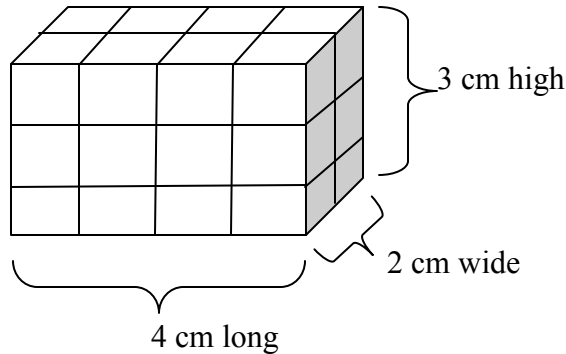


## 11-4: Volume of Prisms and Cylinders

**Volume** is a 3-dimensional unit of space. It can also be thought of as the amount of “stuff” an object can contain.

For objects having rectangular faces, volume is calculated by  $l \cdot w \cdot h$ , which is simply multiplying the three dimensions.



**Volume of prism:**  
 $4\text{cm} \cdot 2\text{cm} \cdot 3\text{cm} = 24\text{cm}^3$

Notice that the units are “cubic”—to the 3<sup>rd</sup> power—since you can count 24 little cubes that make up this rectangular prism.

In general, we can also say that volume can be calculated as (area of base)  $\cdot$  height, or  $V = B \cdot h$

Using the above example, the area of the base is  $4\text{ cm} \cdot 2\text{ cm} = 8\text{ cm}^2$ . Multiply this by the height, and we have  $8\text{ cm}^2 \cdot 3\text{ cm} = 24\text{ cm}^3$ .

Thus, to accommodate different shaped bases, it's easier to just generalize Volume as:

$$V = B \cdot h$$

Where  $B$  is the area of a base and  $h$  is the height connecting the bases.

Also remember that we need to know how to calculate  $B$ , the area of various base shapes:

**Area of a circular base** =  $\pi \cdot r^2$

**Area of a triangular base** =  $(b \cdot h)/2$

**Area of a parallelogram** =  $b \cdot h$

Now it's time to practice...

Find the volume:

