

## Lesson Summary

- The formula for the volume of a prism is  $V = Bh$ , where  $B$  is the area of the base of the prism and  $h$  is the height of the prism.
- A base that is neither a rectangle nor a triangle must be decomposed into rectangles and triangles in order to find the area of the base.

## Problem Set

1. The pieces in Figure 1 are rearranged and put together to form Figure 2.

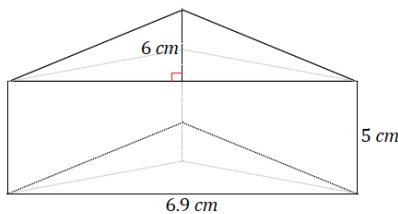


Figure 1

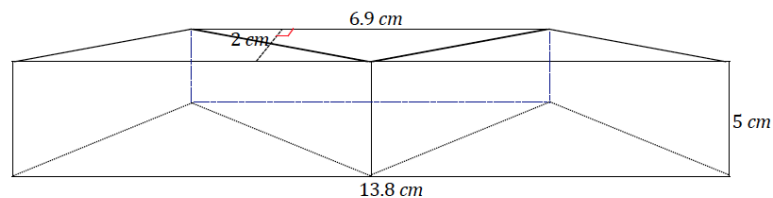


Figure 2

- Use the information in Figure 1 to determine the volume of the prism.
  - Use the information in Figure 2 to determine the volume of the prism.
  - If we were not told that the pieces of Figure 1 were rearranged to create Figure 2, would it be possible to determine whether the volumes of the prisms were equal without completing the entire calculation for each?
- Two right prism containers each hold 75 gallons of water. The height of the first container is 20 inches. The of the second container is 30 inches. If the area of the base in the first container is  $6 \text{ ft}^2$ , find the area of the base in the second container. Explain your reasoning.
  - Two containers are shaped like right rectangular prisms. Each has the same height, but the base of the larger container is 50% more in each direction. If the smaller container holds 8 gallons when full, how many gallons does the larger container hold? Explain your reasoning.
  - A right prism container with the base area of  $4 \text{ ft}^2$  and height of 5 ft. is filled with water until it is 3 ft. deep. If a solid cube with edge length 1 ft. is dropped to the bottom of the container, how much will the water rise?
  - A right prism container with a base area of  $10 \text{ ft}^2$  and height 9 ft. is filled with water until it is 6 ft. deep. A large boulder is dropped to the bottom of the container, and the water rises to the top, completely submerging the boulder without causing overflow. Find the volume of the boulder.
  - A right prism container with a base area of  $8 \text{ ft}^2$  and height 6 ft. is filled with water until it is 5 ft. deep. A solid cube is dropped to the bottom of the container, and the water rises to the top. Find the length of the cube.

7. A rectangular swimming pool is 30 feet wide and 50 feet long. The pool is 3 feet deep at one end, and 10 feet deep at the other.
- Sketch the swimming pool as a right prism.
  - What kind of right prism is the swimming pool?
  - What is the volume of the swimming pool in cubic feet?
  - How many gallons will the swimming pool hold if each cubic feet of water is about 7.5 gallons?
8. A milliliter (mL) has a volume of  $1 \text{ cm}^3$ . A 250 mL measuring cup is filled to 200 mL. A small stone is placed in the measuring cup. The stone is completely submerged, and the water level rises to 250 mL.
- What is the volume of the stone in  $\text{cm}^3$ ?
  - Describe a right rectangular prism that has the same volume as the stone.