

Volume of Rectangular Prisms (Cuboids)

Study the two formulas for the volume of a rectangular prism:

1. $V = w \times d \times h$ (volume is width $\times$ depth $\times$ height)
Some people use width, length, and height instead.

2. $V = A_b \times h$ (volume is area of the bottom $\times$ height)

The width, depth, and height need to be in the same kind of units of length (such as meters). The volume will then be in corresponding cubic units (such as cubic meters).

Example. A room measures 12 ft by 8 ft, and it is 8 ft high. What is the volume of the room? What is the area of the room?

To find the area, we simply multiply the two given dimensions: $A = 12 \text{ ft} \times 8 \text{ ft} = 96 \text{ ft}^2$.

To find the volume, we can multiply the area by the height: $V = 96 \text{ ft}^2 \times 8 \text{ ft} = 768 \text{ ft}^3$.

1. **a.** Find the volume of a box that is 2 inches high, 5 inches wide, and 7 inches deep. Include the units!

$$V = \underline{5 \text{ in.}} \times \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

- b.** Find the area and volume of a room that is 25 ft $\times$ 20 ft, and 9 feet high.

$$A = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$V = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

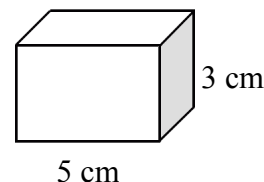
2. Find the volume of a box that is

a. 8 cm wide, 4 cm deep, and 10 cm high.

b. 16 square inches on the bottom, and 6 inches tall.

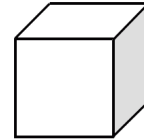
3. A rectangular pool takes up an area of 70 ft $\times$ 25 ft, and it is 6 ft deep. What is its volume?

4. The volume of this box is 30 cm³.
What is its depth?



5. *Optional.* Measure the width, height, and depth of a dresser and/or a fridge.
Find out its volume.

6. The volume of this cube is 8 cubic inches.
How long is its edge?



7. Design a box (give its width, height, and depth) with a volume of

a. 64 cubic inches

b. 1,200 cubic centimeters

8. The length and width of a rectangular box are 5 inches and 6 inches.
Its volume is 180 cubic inches. How tall is it?

9. Find the total volume of these boxes.

