

# Word Problems with Volume

Grade 5 Math • Section 9.5

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 10

## Quick Review and Helpful Hints

**Volume formula:**  $V = l \times w \times h$ .

**Finding a missing dimension:** If  $V$  and two dimensions are known, divide to find the third:  $h = V \div (l \times w)$ .

**Volume is always given in cubic units.** Read the problem carefully to identify what is given and what is asked.

**Example:** A box has a volume of  $480 \text{ in}^3$ . It is 12 in long and 8 in wide. What is the height?

$V = l \times w \times h$ , so  $h = V \div (l \times w) = 480 \div (12 \times 8) = 480 \div 96 = 5 \text{ in}$ .

**Answer:** 5 inches

## Practice Problems

Solve each word problem. Show your work.

- A toy box is 3 ft long, 2 ft wide, and 2 ft tall. What is its volume?  
\_\_\_\_\_
- A rectangular aquarium holds  $1,200 \text{ cm}^3$  of water. It is 15 cm long and 10 cm wide. How deep is the water?  
\_\_\_\_\_
- A cube has a volume of  $125 \text{ cm}^3$ . What is the length of one side? (Hint:  $5 \times 5 \times 5 = ?$ )  
\_\_\_\_\_
- A moving box is 18 in long, 12 in wide, and 15 in tall. How many cubic inches of space does it have?  
\_\_\_\_\_
- A swimming pool is 10 m long, 5 m wide, and 2 m deep. How many cubic meters of water can it hold?  
\_\_\_\_\_
- A storage container has a base area of  $36 \text{ ft}^2$  and a height of 5 ft. What is the volume?  
\_\_\_\_\_
- A crate has a volume of  $864 \text{ in}^3$ . Its length is 12 in and height is 9 in. What is the width?  
\_\_\_\_\_
- Two boxes have the same base (6 cm by 4 cm). Box A is 5 cm tall and Box B is 8 cm tall. How much more volume does Box B have?  
\_\_\_\_\_

## Word Problems

- A sandbox is 6 feet long, 4 feet wide, and 1 foot deep. Sand costs \$2 per cubic foot. How much will it cost to fill the sandbox?  
\_\_\_\_\_
- A warehouse has a room that is 40 ft long, 25 ft wide, and 12 ft tall. Boxes occupy 60% of the room's volume. What volume of the room is empty?  
\_\_\_\_\_



## Answer Keys

- |                         |                          |
|-------------------------|--------------------------|
| 1. $12 \text{ ft}^3$    | 6. $180 \text{ ft}^3$    |
| 2. $8 \text{ cm}$       | 7. $8 \text{ in}$        |
| 3. $5 \text{ cm}$       | 8. $72 \text{ cm}^3$     |
| 4. $3,240 \text{ in}^3$ | 9. $\$48$                |
| 5. $100 \text{ m}^3$    | 10. $4,800 \text{ ft}^3$ |

### Step-by-Step Explanations

- Start with the main idea. For word problems with volume,  $3 \times 2 \times 2 = 12$  cubic feet. Volume counts cubic units, so the unit on the answer should be cubic units.
- Keep the work tidy. For word problems with volume, depth is  $1,200 \div (15 \times 10) = 8 \text{ cm}$ . For rectangular prisms, multiply length, width, and height.
- Look at what the numbers mean. For word problems with volume,  $5 \times 5 \times 5 = 125$ , so the side length is  $5 \text{ cm}$ . For composite figures, find each prism's volume first and then add.
- Use the setup first. For word problems with volume,  $18 \times 12 \times 15 = 3,240$  cubic inches. Volume counts cubic units, so the unit on the answer should be cubic units.
- Check the size of the answer. For word problems with volume,  $10 \times 5 \times 2 = 100$  cubic meters. For rectangular prisms, multiply length, width, and height.
- Match the operation to the words. For word problems with volume,  $V =$

$Bh = 36 \times 5 = 180$  cubic feet. For composite figures, find each prism's volume first and then add.

7. Write the important values first. For word problems with volume, width is  $864 \div (12 \times 9) = 8$  inches. Volume counts cubic units, so the unit on the answer should be cubic units.

8. Follow the pattern carefully. For word problems with volume, the shared base is  $6 \times 4 = 24$ ; extra height is  $8 - 5 = 3$ , so extra volume is  $24 \times 3 = 72$ . For rectangular prisms, multiply length, width, and height.

9. Start with the main idea. For word problems with volume, volume is  $6 \times 4 \times 1 = 24$  cubic feet; cost is  $24 \times 2 = 48$ . For composite figures, find each prism's volume first and then add.

10. Keep the work tidy. For word problems with volume, room volume is  $40 \times 25 \times 12 = 12,000$  cubic feet. Empty space is 40% of that, or 4,800 cubic feet. Volume counts cubic units, so the unit on the answer should be cubic units.



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