

# Volume of Rectangular Prisms

Grade 5 Math • Section 9.3

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

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

Score: \_\_\_\_\_ / 14

## Quick Review and Helpful Hints

**Formula:**  $V = l \times w \times h$  or equivalently  $V = B \times h$ , where  $B$  is the area of the base.

**Units:** if the sides are in cm, the volume is in  $\text{cm}^3$ . If in inches, the volume is in  $\text{in}^3$ .

**Make sure** all measurements use the **same** unit before computing.

**Example:** Find the volume of a box that is 8 cm long, 5 cm wide, and 3 cm tall.

$V = l \times w \times h = 8 \times 5 \times 3 = 120 \text{ cm}^3$ .

**Answer:**  $120 \text{ cm}^3$

## Practice Problems

Find the volume of each rectangular prism.

- |  |   |
|--|---|
| 1. $l = 6 \text{ in}$ , $w = 4 \text{ in}$ , $h = 3 \text{ in}$ . $V =$ _____  | 7. $l = 4 \text{ ft}$ , $w = 4 \text{ ft}$ , $h = 10 \text{ ft}$ . $V =$ _____  |
| 2. $l = 10 \text{ cm}$ , $w = 5 \text{ cm}$ , $h = 2 \text{ cm}$ . $V =$ _____ | 8. $l = 11 \text{ m}$ , $w = 3 \text{ m}$ , $h = 6 \text{ m}$ . $V =$ _____     |
| 3. $l = 7 \text{ ft}$ , $w = 7 \text{ ft}$ , $h = 7 \text{ ft}$ . $V =$ _____  | 9. $l = 20 \text{ cm}$ , $w = 10 \text{ cm}$ , $h = 5 \text{ cm}$ . $V =$ _____ |
| 4. $l = 12 \text{ m}$ , $w = 3 \text{ m}$ , $h = 5 \text{ m}$ . $V =$ _____    | 10. $l = 8 \text{ in}$ , $w = 6 \text{ in}$ , $h = 5 \text{ in}$ . $V =$ _____  |
| 5. $l = 9 \text{ in}$ , $w = 8 \text{ in}$ , $h = 4 \text{ in}$ . $V =$ _____  | 11. A cube has side 9 cm. $V =$ _____   |
| 6. $l = 15 \text{ cm}$ , $w = 6 \text{ cm}$ , $h = 2 \text{ cm}$ . $V =$ _____ | 12. $B = 24 \text{ ft}^2$ , $h = 7 \text{ ft}$ . $V =$ _____                    |

## Word Problems

13. A fish tank is 30 cm long, 20 cm wide, and 25 cm tall. What is the volume? \_\_\_\_\_
14. A shipping box has a volume of  $360 \text{ in}^3$ . It is 12 in long and 6 in wide. What is its height? \_\_\_\_\_



## Answer Keys

- |                       |                           |
|-----------------------|---------------------------|
| 1. $72 \text{ in}^3$  | 8. $198 \text{ m}^3$      |
| 2. $100 \text{ cm}^3$ | 9. $1,000 \text{ cm}^3$   |
| 3. $343 \text{ ft}^3$ | 10. $240 \text{ in}^3$    |
| 4. $180 \text{ m}^3$  | 11. $729 \text{ cm}^3$    |
| 5. $288 \text{ in}^3$ | 12. $168 \text{ ft}^3$    |
| 6. $180 \text{ cm}^3$ | 13. $15,000 \text{ cm}^3$ |
| 7. $160 \text{ ft}^3$ | 14. $5 \text{ in}$        |

### Step-by-Step Explanations

- Start with the main idea. For volume of rectangular prisms,  $V = lwh = 6 \times 4 \times 3 = 72$  cubic inches. Volume counts cubic units, so the unit on the answer should be cubic units.
- Keep the work tidy. For volume of rectangular prisms,  $10 \times 5 \times 2 = 100$  cubic centimeters. For rectangular prisms, multiply length, width, and height.
- Look at what the numbers mean. For volume of rectangular prisms,  $7 \times 7 \times 7 = 343$  cubic feet. For composite figures, find each prism's volume first and then add.
- Use the setup first. For volume of rectangular prisms,  $12 \times 3 \times 5 = 180$  cubic meters. Volume counts cubic units, so the unit on the answer should be cubic units.
- Check the size of the answer. For volume of rectangular prisms,  $9 \times 8 \times 4 = 288$  cubic inches. For rectangular prisms, multiply length, width, and height.
- Match the operation to the words. For volume of rectangular prisms,  $15 \times 6 \times 2 = 180$  cubic centimeters. For composite figures, find each prism's volume first and then add.
- Write the important values first. For volume of rectangular prisms,  $4 \times 4 \times 10 = 160$  cubic feet. Volume counts cubic units, so the unit on the answer should be cubic units.
- Follow the pattern carefully. For volume of rectangular prisms,  $11 \times 3 \times 6 = 198$  cubic meters. For rectangular prisms, multiply length, width, and height.
- Start with the main idea. For volume of rectangular prisms,  $20 \times 10 \times 5 = 1,000$  cubic centimeters. For composite figures, find each prism's volume first and then add.
- Keep the work tidy. For volume of rectangular prisms,  $8 \times 6 \times 5 = 240$  cubic inches. Volume counts cubic units, so the unit on the answer should be cubic units.
- Look at what the numbers mean. For volume of rectangular prisms, a cube with side 9 has volume  $9^3 = 729$ . For rectangular prisms, multiply length, width, and height.
- Use the setup first. For volume of rectangular prisms,  $V = Bh = 24 \times 7 = 168$  cubic feet. For composite figures, find each prism's volume first and then add.
- Check the size of the answer. For volume of rectangular prisms,  $30 \times 20 \times 25 = 15,000$  cubic centimeters. Volume counts cubic units, so the unit on the answer should be cubic units.
- Match the operation to the words. For volume of rectangular prisms, height is  $360 \div (12 \times 6) = 360 \div 72 = 5$  inches. For rectangular prisms, multiply length, width, and height.



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