

Volume of Rectangular Prisms

Grade 5 Math • Section 9.3

Name: _____

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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 cm^3 . If in inches, the volume is in 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 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 in^3 . It is 12 in long and 6 in wide. What is its height?



Answer Keys

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