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 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.

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

Answer: 120 cm^3

Practice Problems

Find the volume of each rectangular prism.

1. $l = 6$ in, $w = 4$ in, $h = 3$ in. $V =$ _____

2. $l = 10$ cm, $w = 5$ cm, $h = 2$ cm. $V =$ _____

3. $l = 7$ ft, $w = 7$ ft, $h = 7$ ft. $V =$ _____

4. $l = 12$ m, $w = 3$ m, $h = 5$ m. $V =$ _____

5. $l = 9$ in, $w = 8$ in, $h = 4$ in. $V =$ _____

6. $l = 15$ cm, $w = 6$ cm, $h = 2$ cm. $V =$ _____

7. $l = 4$ ft, $w = 4$ ft, $h = 10$ ft. $V =$ _____

8. $l = 11$ m, $w = 3$ m, $h = 6$ m. $V =$ _____

9. $l = 20$ cm, $w = 10$ cm, $h = 5$ cm. $V =$ _____

10. $l = 8$ in, $w = 6$ in, $h = 5$ in. $V =$ _____

11. A cube has side 9 cm. $V =$ _____

12. $B = 24$ ft^2, $h = 7$ 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. $72\ \text{in}^3$
2. $100\ \text{cm}^3$
3. $343\ \text{ft}^3$
4. $180\ \text{m}^3$
5. $288\ \text{in}^3$
6. $180\ \text{cm}^3$
7. $160\ \text{ft}^3$
8. $198\ \text{m}^3$
9. $1{,}000\ \text{cm}^3$
10. $240\ \text{in}^3$
11. $729\ \text{cm}^3$
12. $168\ \text{ft}^3$
13. $15{,}000\ \text{cm}^3$
14. $5\ \text{in}$

Step-by-Step Explanations

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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.

11. 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.

12. 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.

13. 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.

14. 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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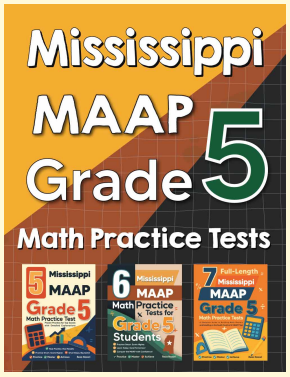

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