

Measuring Volume by Counting Unit Cubes

Grade 5 Math • Section 9.2

Name: _____

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Quick Review and Helpful Hints

Counting cubes: Count all unit cubes that fill the solid figure, including any hidden cubes behind or beneath the visible ones.

A systematic approach: count the cubes in one layer, then multiply by the number of layers.

Don't forget cubes you can't see in a 3D drawing! Count layer by layer.

Example: A rectangular prism is 4 cubes long, 3 cubes wide, and 2 cubes tall. Find the volume.

One layer: $4 \times 3 = 12$ cubes. Two layers: $12 \times 2 = 24$ cubes. Volume = 24 cubic units.

Answer: 24 cubic units

Practice Problems

Find the volume of each rectangular prism.

- | | |
|--|---|
| 1. 5 cubes long, 3 cubes wide, 2 cubes tall. $V =$ _____ | 6. 8 cubes long, 2 cubes wide, 4 cubes tall. $V =$ _____ |
| 2. 4 cubes long, 4 cubes wide, 4 cubes tall. $V =$ _____ | 7. 10 cubes long, 5 cubes wide, 1 cube tall. $V =$ _____ |
| 3. 6 cubes long, 2 cubes wide, 3 cubes tall. $V =$ _____ | 8. 6 cubes long, 4 cubes wide, 3 cubes tall. $V =$ _____ |
| 4. 7 cubes long, 1 cube wide, 5 cubes tall. $V =$ _____ | 9. 2 cubes long, 2 cubes wide, 9 cubes tall. $V =$ _____ |
| 5. 3 cubes long, 3 cubes wide, 3 cubes tall. $V =$ _____ | 10. 5 cubes long, 5 cubes wide, 2 cubes tall. $V =$ _____ |

Word Problems

11. A storage container is 8 cubes long, 5 cubes wide, and 3 cubes tall. Each unit cube is 1 cm^3 . What is the volume in cubic centimeters? _____

12. A block tower has a base layer with 6 cubes by 4 cubes. There are 7 identical layers. What is the volume in cubic units? _____



Answer Keys

1. 30

2. 64

3. 36

4. 35

5. 27

6. 64

7. 50

8. 72

9. 36

10. 50

11. 120 cm^3

12. 168

Step-by-Step Explanations

1. Start with the main idea. For measuring volume by counting unit cubes, $5 \times 3 \times 2 = 30$ cubic units. Volume counts cubic units, so the unit on the answer should be cubic units.

2. Keep the work tidy. For measuring volume by counting unit cubes, $4 \times 4 \times 4 = 64$ cubic units. For rectangular prisms, multiply length, width, and height.

3. Look at what the numbers mean. For measuring volume by counting unit cubes, $6 \times 2 \times 3 = 36$ cubic units. For composite figures, find each prism's volume first and then add.

4. Use the setup first. For measuring volume by counting unit cubes, $7 \times 1 \times 5 = 35$ cubic units. Volume counts cubic units, so the unit on the answer should be cubic units.

5. Check the size of the answer. For measuring volume by counting unit cubes, $3 \times 3 \times 3 = 27$ cubic units. For rectangular prisms, multiply length, width, and height.

6. Match the operation to the words. For measuring volume by counting unit cubes, $8 \times 2 \times 4 = 64$ cubic units. For composite figures, find each prism's volume first and then add.

7. Write the important values first. For measuring volume by counting unit cubes, $10 \times 5 \times 1 = 50$ cubic units. Volume counts cubic units, so the unit on the answer should be cubic units.

8. Follow the pattern carefully. For measuring volume by counting unit cubes, $6 \times 4 \times 3 = 72$ cubic units. For rectangular prisms, multiply length, width, and height.

9. Start with the main idea. For measuring volume by counting unit cubes, $2 \times 2 \times 9 = 36$ cubic units. For composite figures, find each prism's volume first and then add.

10. Keep the work tidy. For measuring volume by counting unit cubes, $5 \times 5 \times 2 = 50$ cubic units. Volume counts cubic units, so the unit on the answer should be cubic units.

11. Look at what the numbers mean. For measuring volume by counting unit cubes, $8 \times 5 \times 3 = 120$ cubic centimeters. For rectangular prisms, multiply length, width, and height.

12. Use the setup first. For measuring volume by counting unit cubes, the base has $6 \times 4 = 24$ cubes; $24 \times 7 = 168$ cubic units. For composite figures, find each prism's volume first and then add.



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