

# Measuring Volume by Counting Unit Cubes

Grade 5 Math • Section 9.2

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

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

Score: \_\_\_\_\_ / 12

## 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  $1 \text{ cm}^3$ . 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.  $120 \text{ cm}^3$

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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