

Cube Count Quest

Find volume by counting layers and multiplying edge lengths.

GRADE 5 • 5.MD.C.5a

CCSS.Math.Content.5.MD.C.5a "Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths..."

NAME _____

DATE _____

BUILD VOLUME IN LAYERS

A right rectangular prism is filled with equal layers of unit cubes. Find the number of cubes in one base layer, then multiply by the number of layers, or multiply length $\times$ width $\times$ height.

WORKED EXAMPLE

Find the volume of a right rectangular prism that is 3 units long, 4 units wide, and 6 units high.

1. One base layer holds $3 \times 4 = 12$ unit cubes.
2. With 6 layers, $12 \times 6 = 72$ unit cubes.
3. Multiplying all edge lengths gives $3 \times 4 \times 6 = 72$.

Answer: 72 cubic units

PRACTICE 6 problems

- 1** A rectangular prism is 2 units long, 5 units wide, and 7 units high. Find its volume.

ANSWER _____

- 2** A rectangular prism has a base area of 56 square units and a height of 2 units. Find its volume.

ANSWER _____

- 3** A rectangular prism has a base that is 8 units by 9 units. It is 7 units high. Find its volume.

ANSWER _____

- 4** A prism is packed with 5 layers of unit cubes. Each layer has 8 rows with 2 cubes in each row. How many unit cubes fill the prism?

ANSWER _____

- 5** A prism is 7 units long, 7 units wide, and 2 units high. Find the volume by multiplying the base area by the height.

ANSWER _____

- 6** Write a three-factor multiplication equation and find the volume of a prism that is 9 units by 5 units by 8 units.

ANSWER _____

APPLY IT Show your work

- 1** A game club packs prize cards in a rectangular box that is 9 cm long, 2 cm wide, and 8 cm high. What is the volume of the box?

WORK SPACE

ANSWER _____

- 2** The art team has a rectangular supply bin that is 7 inches long, 5 inches wide, and 9 inches high. What is the volume of the bin?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A rectangular prism has a base that is 7 units by 8 units and a volume of 280 cubic units. Find the height. Explain how the base area helps you find it.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A rectangular prism is 2 units long, 5 units wide, and 7 units high. Find its volume.	70 cubic units
2	A rectangular prism has a base area of 56 square units and a height of 2 units. Find its volume.	112 cubic units
3	A rectangular prism has a base that is 8 units by 9 units. It is 7 units high. Find its volume.	504 cubic units
4	A prism is packed with 5 layers of unit cubes. Each layer has 8 rows with 2 cubes in each row. How many unit cubes fill the prism?	80 cubic units
5	A prism is 7 units long, 7 units wide, and 2 units high. Find the volume by multiplying the base area by the height.	98 cubic units
6	Write a three-factor multiplication equation and find the volume of a prism that is 9 units by 5 units by 8 units.	$9 \times 5 \times 8 = 360$ cubic units

PART 2 • APPLY IT

- 144 cubic centimeters** Multiply 9×2 to find a base area of 18 square centimeters. Then multiply $18 \times 8 = 144$ cubic centimeters.
- 315 cubic inches** Multiply the edge lengths: $7 \times 5 \times 9 = 315$ cubic inches.

CHALLENGE

The height is 5 units. The base area is $7 \times 8 = 56$ square units, and $280 / 56 = 5$ layers.

Accept any correct multiplication order or grouping, including base area $\times$ height. Students should label volume with cubic units when units are given.