

Cube Count Quest

Find volume by counting equal layers of unit cubes.

GRADE 5 • NY-5.MD.4

NY-5.MD.4 "Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft., and improvised units."

NAME _____

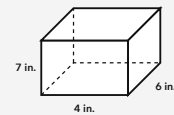
DATE _____

COUNT THE LAYERS

Volume tells how much space a solid takes up. Count the unit cubes in one layer, then multiply by the number of equal layers. Write the answer in cubic units.

WORKED EXAMPLE

What is the volume of the rectangular prism shown?

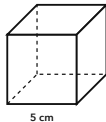


1. One layer has $4 \times 6 = 24$ unit cubes.
2. There are 7 equal layers.
3. $24 \times 7 = 168$.

Answer: 168 in³

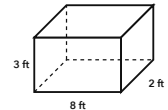
PRACTICE 6 problems

- 1** What is the volume of the cube shown?



ANSWER _____

- 2** What is the volume of the rectangular prism shown?



ANSWER _____

- 3** A model has 5 equal layers. Each layer has 2 rows of 9 unit snap-cubes. What is the volume in cubic snap-cubes?

ANSWER _____

- 4** A rectangular prism is 9 in. long, 3 in. wide, and 2 in. high. What is its volume?

ANSWER _____

- 5** A box is 8 cm long, 3 cm wide, and 5 cm high. What is its volume?

ANSWER _____

- 6** Prism A has dimensions 3 cm by 3 cm by 8 cm. Prism B has dimensions 2 cm by 9 cm by 5 cm. Which prism has the greater volume, and how many more cubic centimeters does it hold?

ANSWER _____

APPLY IT Show your work

- 1** Jalen is building a rectangular display space for mini game figures. The space is 8 cm long, 5 cm wide, and 3 cm high. What is the volume of the display space?

WORK SPACE

ANSWER _____

- 2** The school gardening club fills a rectangular raised bed with soil. The bed is 9 ft long, 2 ft wide, and 3 ft deep. What volume of soil can the bed hold?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A rectangular prism is built from 120 one-inch unit cubes. Its base has 5 rows of 8 cubes. How many layers does the prism have? Explain your reasoning.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	What is the volume of the cube shown?	125 cm³
2	What is the volume of the rectangular prism shown?	48 ft³
3	A model has 5 equal layers. Each layer has 2 rows of 9 unit snap-cubes. What is the volume in cubic snap-cubes?	90 cubic snap-cubes
4	A rectangular prism is 9 in. long, 3 in. wide, and 2 in. high. What is its volume?	54 in³
5	A box is 8 cm long, 3 cm wide, and 5 cm high. What is its volume?	120 cm³
6	Prism A has dimensions 3 cm by 3 cm by 8 cm. Prism B has dimensions 2 cm by 9 cm by 5 cm. Which prism has the greater volume, and how many more cubic centimeters does it hold?	Prism B, 18 cm³ more

PART 2 • APPLY IT

- 120 cm³** Multiply the cubes in one layer, $8 \times 5 = 40$. Then multiply by 3 layers: $40 \times 3 = 120$.
- 54 ft³** Multiply the three dimensions: $9 \times 2 \times 3 = 54$ cubic feet.

CHALLENGE

The base has $5 \times 8 = 40$ cubes. $120 \div 40 = 3$, so the prism has 3 layers.

Require cubic units for all volume answers. For the challenge, accept any correct explanation that finds 40 cubes in each layer and divides 120 by 40.