LESSON MAKER PRO

Build the Volume

Count layers and multiply to find space inside a box.

GRADE 5 · 5.MD.5

5.MD.5 "Relate volume to the operations of multiplication and solve real-world and mathematical problems involving volume. Find the volume of a right rectangular prism with whole number dimensions by multiplying them..."

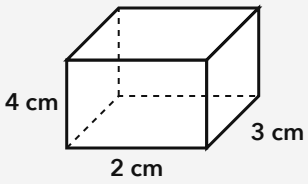
NAME _____ DATE _____

COUNT THE LAYERS

A rectangular prism's bottom layer holds length × width unit cubes. Multiply the cubes in one layer by the number of layers: V = l × w × h = B × h, where B is the area of the base.

WORKED EXAMPLE

How many 1-cm cubes fill the prism shown? Find its volume.

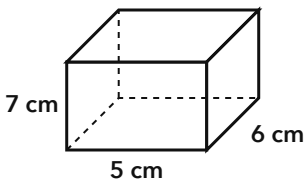


1. One bottom layer holds 2 × 3 = 6 cubes.
2. Four layers hold 6 × 4 = 24 cubes.
3. V = 2 × 3 × 4 = 24 cm^3.

Answer: 24 cubes; 24 cm^3

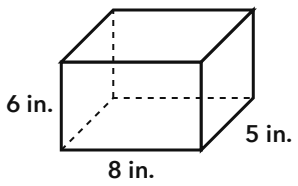
PRACTICE 6 problems

1 Find the volume of the prism shown.



ANSWER _____

2 Find the volume of the prism shown.

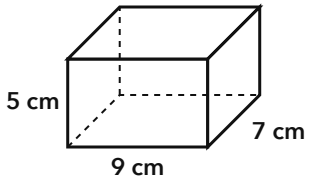


ANSWER _____

3 A rectangular prism has a base area of 56 square inches and a height of 9 inches. What is its volume?

ANSWER _____

4 Find the volume of the prism shown.



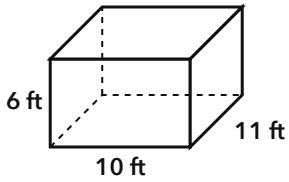
ANSWER _____

5 A prism has 8 layers with 35 unit cubes in each layer. How many unit cubes does it hold? What is its volume in cubic units?

ANSWER _____

_____

6 Find the volume of the prism shown.



ANSWER _____

APPLY IT Show your work

1 A storage bin for board-game pieces is 10 inches long, 8 inches wide, and 6 inches high on the inside. What is its inside volume?

WORK SPACE

ANSWER _____

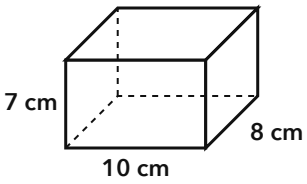
2 A class fills a clear box with 1-cm cubes for an art display. The box is 8 cm long, 8 cm wide, and 9 cm high on the inside. How many cubes fit with no gaps?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Compare the prism shown with a second prism that is 9 cm long, 9 cm wide, and 7 cm high. Which has greater volume, and by how much? Show your multiplication.



WORK SPACE AND ANSWER

ANSWER KEY

Build the Volume

GRADE 5 · 5.MD.5

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the volume of the prism shown.	**210 cm^3**
2	Find the volume of the prism shown.	**240 $in.^3$**
3	A rectangular prism has a base area of 56 square inches and a height of 9 inches. What is its volume?	**504 $in.^3$**
4	Find the volume of the prism shown.	**315 cm^3**
5	A prism has 8 layers with 35 unit cubes in each layer. How many unit cubes does it hold? What is its volume in cubic units?	**280 unit cubes; 280 cubic units**
6	Find the volume of the prism shown.	**660 ft^3**

PART 2 · APPLY IT

1. **480 $in.^3$** Multiply the inside dimensions: 10 × 8 × 6 = 480 cubic inches.
2. **576 cubes** Each layer holds 8 × 8 = 64 cubes. Nine layers hold 64 × 9 = 576 cubes.

CHALLENGE

The second prism is greater by 7 cm^3. The shown prism is 10 × 8 × 7 = 560 cm^3; the second is 9 × 9 × 7 = 567 cm^3.

Accept equivalent multiplication orders and correctly written cubic units. In the cube-counting problems, the number of unit cubes equals the volume in cubic units.