LESSON MAKER PRO

Cube by Cube

Find the space inside rectangular prisms.

GRADE 5 · 5.MD.5a

5.MD.5a "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..."

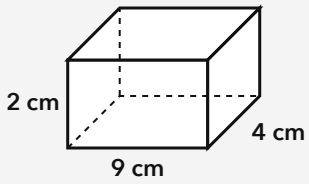
NAME _____ DATE _____

COUNT THE LAYERS

A rectangular prism can be filled with unit cubes. Multiply its length by its width to find the cubes in one layer. Then multiply by its height to find the number of layers and the total volume.

WORKED EXAMPLE

Find the volume of the prism shown. Show how counting cubes in layers matches multiplication.

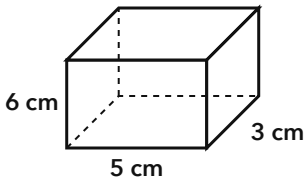


1. 9 x 4 = 36 one-cm cubes in each layer.
2. 36 x 2 = 72 one-cm cubes in all.
3. 9 x 4 x 2 = 72 cubic cm.

Answer: 72 cubic cm

PRACTICE 6 problems

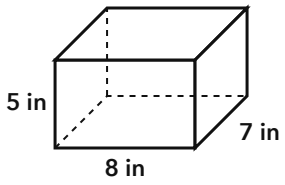
1 For the prism shown, how many one-cm cubes fit in one bottom layer? How many fill the whole prism?



ANSWER _____

_____

2 What is the volume of the prism shown?



ANSWER _____

3 A rectangular prism is 11 cm long, 3 cm wide, and 5 cm high. What is its volume?

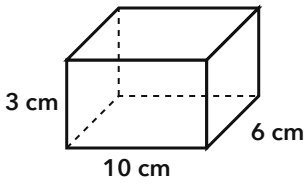
ANSWER _____

4 Each layer of a prism has 7 rows of 8 unit cubes. The prism has 3 layers. Write a multiplication equation and find how many cubes fill it.

ANSWER _____

_____

5 What is the volume of the prism shown? Show how counting cubes in layers gives the same total.



ANSWER _____

_____

6 A rectangular prism is 13 units long, 5 units wide, and 3 units high. Find its volume.

ANSWER _____

APPLY IT Show your work

1 A box for a board game has an inside space that is 12 cm long, 8 cm wide, and 5 cm high. What is the volume of the space inside?

WORK SPACE

ANSWER _____

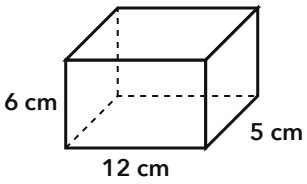
2 A student is making a solid foam block for a miniature skate park. The block is 7 cm long, 6 cm wide, and 5 cm high. How many one-cm cubes would fill the same space?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A second prism is 15 cm long and 8 cm wide. What height would give it the same volume as the prism shown? Explain using layers of one-cm cubes.



WORK SPACE AND ANSWER

ANSWER KEY

Cube by Cube

GRADE 5 · 5.MD.5a

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For the prism shown, how many one-cm cubes fit in one bottom layer? How many fill the whole prism?	**15 cubes in one layer; 90 cubes in the whole prism**
2	What is the volume of the prism shown?	**280 cubic inches**
3	A rectangular prism is 11 cm long, 3 cm wide, and 5 cm high. What is its volume?	**165 cubic cm**
4	Each layer of a prism has 7 rows of 8 unit cubes. The prism has 3 layers. Write a multiplication equation and find how many cubes fill it.	**7 x 8 x 3 = 168 unit cubes**
5	What is the volume of the prism shown? Show how counting cubes in layers gives the same total.	**10 x 6 = 60 cubes per layer; 60 x 3 = 180 cubic cm**
6	A rectangular prism is 13 units long, 5 units wide, and 3 units high. Find its volume.	**195 cubic units**

PART 2 · APPLY IT

1. **480 cubic cm** Multiply the inside dimensions: 12 x 8 x 5 = 480 cubic cm.
2. **210 one-cm cubes** Each layer holds 7 x 6 = 42 cubes. Five layers hold 42 x 5 = 210 cubes.

CHALLENGE

3 cm. The shown prism holds 12 x 5 x 6 = 360 one-cm cubes. The second prism holds 15 x 8 = 120 cubes per layer, so it needs 360 / 120 = 3 layers.

Accept factors in any order. A count of one-cm cubes is equivalent to the same number of cubic cm.