LESSON MAKER PRO

Cube Count Lab

Count layers to find volume.

GRADE 7 · 7.GM.1.3

7.GM.1.3 "Using a variety of tools and strategies, develop the concept that the volume of rectangular prisms can be found by counting the total number of same-sized unit cubes that fill a shape without gaps or overlaps..."

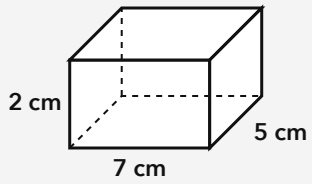
NAME _____ DATE _____

CUBES MAKE VOLUME

Equal-sized cubes can fill a rectangular prism without gaps or overlaps. Count the cubes in one layer, then multiply by the number of layers. If each cube has edges of 1 cm, the cube count is the volume in cm^3.

WORKED EXAMPLE

The prism shown is filled with 1-cm cubes. Find its volume.

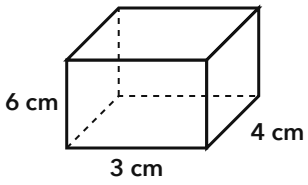


1. One bottom layer holds 7 × 5 = 35 cubes.
2. There are 2 layers, so the prism holds 35 × 2 = 70 cubes.
3. Each cube has a volume of 1 cm^3.

Answer: 70 cm^3

PRACTICE 6 problems

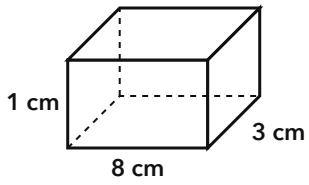
1 The prism shown is filled with 1-cm cubes. How many cubes are in one bottom layer? What is its volume?



ANSWER _____

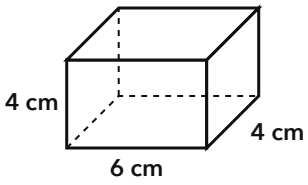
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2 How many 1-cm cubes fill the prism shown?



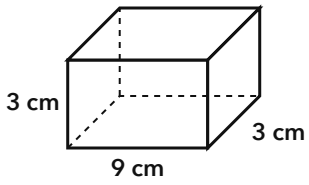
ANSWER _____

3 Find the volume of the prism shown using 1-cm cubes.



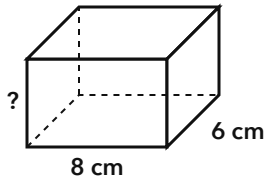
ANSWER _____

4 The prism shown is filled with 1-cm cubes. How many cubes fill it?



ANSWER _____

5 The prism shown holds 144 cubes with edges of 1 cm. Find its height.



ANSWER _____

6 Each prism is filled with 1-cm cubes. How much greater is Prism A's volume than Prism B's volume?

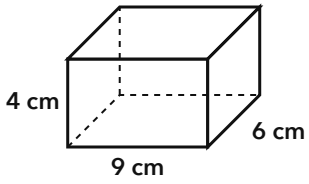
CUBES IN TWO PRISMS

Prism	Cubes per layer	Layers
A	8	9
B	9	6

ANSWER _____

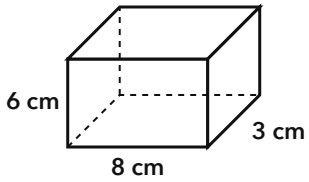
APPLY IT Show your work

1 A storage case has the inside dimensions shown. How many 1-cm cubes could fill it without gaps? What is its capacity in cm^3?



ANSWER _____

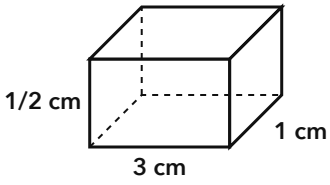
2 You build a solid platform in a building game using 1-cm cubes. Its dimensions are shown. How many cubes do you need?



ANSWER _____

CHALLENGE One step up

The prism shown is filled with cubes whose edges are 1/2 cm. How many cubes fill it, and what is its volume in cm^3? Explain why the two numbers differ.



WORK SPACE AND ANSWER

ANSWER KEY

Cube Count Lab

GRADE 7 · 7.GM.1.3

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The prism shown is filled with 1-cm cubes. How many cubes are in one bottom layer? What is its volume?	**12 cubes in one bottom layer; 72 cm^3**
2	How many 1-cm cubes fill the prism shown?	**24 cubes**
3	Find the volume of the prism shown using 1-cm cubes.	**96 cm^3**
4	The prism shown is filled with 1-cm cubes. How many cubes fill it?	**81 cubes**
5	The prism shown holds 144 cubes with edges of 1 cm. Find its height.	**3 cm**
6	Each prism is filled with 1-cm cubes. How much greater is Prism A's volume than Prism B's volume?	**18 cm^3**

PART 2 · APPLY IT

1. **216 cubes; 216 cm^3** One layer holds 9 × 6 = 54 cubes. Four layers hold 216 cubes, so the capacity is 216 cm^3.
2. **144 cubes** Each layer holds 8 × 3 = 24 cubes. Six layers require 24 × 6 = 144 cubes.

CHALLENGE

It takes 12 cubes because 6 × 2 × 1 = 12. Each cube has a volume of 1/8 cm^3, so the prism's volume is 12/8 = 3/2 cm^3.

Accept 1.5 cm^3 for the challenge volume. Cube counts and volumes in cm^3 are different quantities, even when their numbers match for 1-cm cubes.