LESSON MAKER PRO

Cube Count Volume

Find how many unit cubes fill each solid.

GRADE 5 · 5.MD.C.3b

CCSS.Math.Content.5.MD.C.3b "A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units."

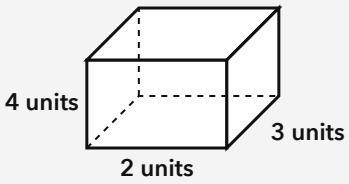
NAME _____ DATE _____

VOLUME FROM UNIT CUBES

Volume tells how many unit cubes fill a solid with no gaps or overlaps. For a rectangular prism, find the cubes in one layer, then multiply by the number of layers. Write the answer in cubic units.

WORKED EXAMPLE

The prism has length 2 units, width 3 units and height 4 units. How many unit cubes fill it without gaps or overlaps?

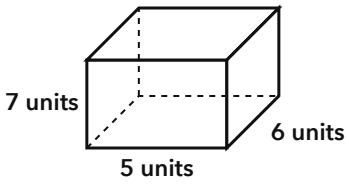


1. One layer has 2 x 3 = 6 unit cubes.
2. The prism has 4 layers.
3. 6 x 4 = 24 cubic units.

Answer: 24 cubic units

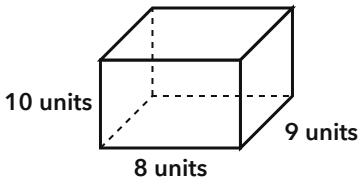
PRACTICE 6 problems

1 The prism has length 5 units, width 6 units and height 7 units. How many unit cubes fill it?



ANSWER _____

2 The prism has length 8 units, width 9 units and height 10 units. How many unit cubes fill it?



ANSWER _____

3 A rectangular prism has 5 unit cubes in each row, 8 rows in each layer, and 11 layers. What is its volume?

ANSWER _____

4 A solid is filled with 378 unit cubes, with no gaps or overlaps. What is its volume?

ANSWER _____

5 A storage block has 12 unit cubes in each row, 13 rows in each layer, and 8 layers. What is its volume?

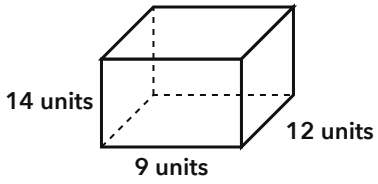
ANSWER _____

6 A rectangular prism has 11 unit cubes in each row, 12 rows in each layer, and 13 layers. What is its volume?

ANSWER _____

APPLY IT Show your work

1 A student designs a storage box for trading cards. The box has length 9 units, width 12 units and height 14 units. It is packed with unit cubes without gaps or overlaps to test its capacity. What is its volume?



ANSWER _____

2 A robotics team makes a rectangular practice block from unit cubes. Each layer has 15 rows with 16 unit cubes in each row. The block has 17 layers. What is the volume of the block?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A museum display uses 1,260 unit cubes. It has 9 cubes in each row and 10 rows in every layer. It uses all the cubes. How many layers does the display have? Explain your reasoning.

WORK SPACE AND ANSWER

ANSWER KEY

Cube Count Volume

GRADE 5 · 5.MD.C.3b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The prism has length 5 units, width 6 units and height 7 units. How many unit cubes fill it?	**210 cubic units**
2	The prism has length 8 units, width 9 units and height 10 units. How many unit cubes fill it?	**720 cubic units**
3	A rectangular prism has 5 unit cubes in each row, 8 rows in each layer, and 11 layers. What is its volume?	**440 cubic units**
4	A solid is filled with 378 unit cubes, with no gaps or overlaps. What is its volume?	**378 cubic units**
5	A storage block has 12 unit cubes in each row, 13 rows in each layer, and 8 layers. What is its volume?	**1,248 cubic units**
6	A rectangular prism has 11 unit cubes in each row, 12 rows in each layer, and 13 layers. What is its volume?	**1,716 cubic units**

PART 2 · APPLY IT

1. **1,512 cubic units** Multiply the cubes in one layer, 9 x 12 = 108. Then multiply by 14 layers: 108 x 14 = 1,512.
2. **4,080 cubic units** Each layer has 15 x 16 = 240 unit cubes. Multiply 240 x 17 to get 4,080 cubic units.

CHALLENGE

14 layers. Each layer has 9 x 10 = 90 cubes, and 1,260 / 90 = 14.

Accept answers that include the correct number and cubic units. For the challenge, accept any clear explanation that finds 90 cubes per layer and 14 layers.