LESSON MAKER PRO

Cube Space Detectives

Use unit cubes to measure volume in cubic units.

GRADE 5 · 5.MD.C.3a

CCSS.Math.Content.5.MD.C.3a "A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume."

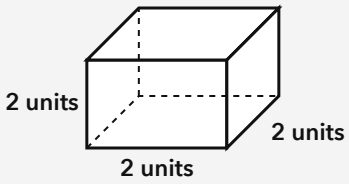
NAME _____ DATE _____

MEASURE SPACE WITH CUBES

A unit cube has side lengths of 1 unit. One unit cube fills one cubic unit of space. When a solid is built from unit cubes, count all the cubes to find its volume.

WORKED EXAMPLE

The outline shows a cube model filled with unit cubes: length 2 units, width 2 units and height 2 units. What is its volume?

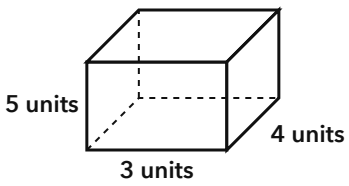


1. Count 2 unit cubes in each row.
2. Count 2 rows in each layer: 2 × 2 = 4 unit cubes per layer.
3. Count 2 layers: 4 × 2 = 8 unit cubes.

Answer: 8 cubic units

PRACTICE 6 problems

1 The rectangular prism is filled with unit cubes. Its length is 3 units, width is 4 units and height is 5 units. What is its volume?



ANSWER _____

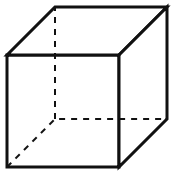
2 A model is made of 7 unit cubes. What is its volume?

ANSWER _____

3 Which label correctly tells the volume of a solid made from 9 unit cubes: 9 units, 9 square units, or 9 cubic units?

ANSWER _____

4 The cube is filled with unit cubes and each edge is 3 units long. What is its volume?



ANSWER _____

5 A box is filled with 6 layers of unit cubes. Each layer has 5 unit cubes. What is the volume of the cube model?

ANSWER _____

6 A rectangular model has 4 rows of unit cubes. Each row has 5 cubes, and the model has 3 equal layers. What is its volume?

ANSWER _____

APPLY IT Show your work

1 An after-school game design club builds a block trophy from unit cubes. The trophy has 3 layers. Each layer has 4 rows with 5 unit cubes in each row. What is the trophy's volume?

WORK SPACE

ANSWER _____

2 Maya builds a mini robot from unit cubes for a makerspace display. The robot has 6 layers. Each layer has 3 rows of 7 unit cubes. What is the robot's volume?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two block sculptures are built from unit cubes. Sculpture A has 4 layers, with 3 rows of 5 cubes in each layer. Sculpture B has 3 layers, with 4 rows of 5 cubes in each layer. Do the sculptures have the same volume? Explain your reasoning.

WORK SPACE AND ANSWER

ANSWER KEY

Cube Space Detectives

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The rectangular prism is filled with unit cubes. Its length is 3 units, width is 4 units and height is 5 units. What is its volume?	**60 cubic units**
2	A model is made of 7 unit cubes. What is its volume?	**7 cubic units**
3	Which label correctly tells the volume of a solid made from 9 unit cubes: 9 units, 9 square units, or 9 cubic units?	**9 cubic units**
4	The cube is filled with unit cubes and each edge is 3 units long. What is its volume?	**27 cubic units**
5	A box is filled with 6 layers of unit cubes. Each layer has 5 unit cubes. What is the volume of the cube model?	**30 cubic units**
6	A rectangular model has 4 rows of unit cubes. Each row has 5 cubes, and the model has 3 equal layers. What is its volume?	**60 cubic units**

PART 2 · APPLY IT

1. **60 cubic units** Find the cubes in one layer: 4 × 5 = 20. Then multiply by 3 layers: 20 × 3 = 60 cubic units.
2. **126 cubic units** Find the cubes in one layer: 3 × 7 = 21. Then multiply by 6 layers: 21 × 6 = 126 cubic units.

CHALLENGE

Yes. Sculpture A has 4 × 3 × 5 = 60 cubic units. Sculpture B has 3 × 4 × 5 = 60 cubic units, so both sculptures have the same volume.

Accept “cubic units” or “units cubed” for volume answers. For the challenge, accept any clear explanation showing that both models contain 60 unit cubes.