Cube Count Sort

How many 1 cm cubes fill each prism?

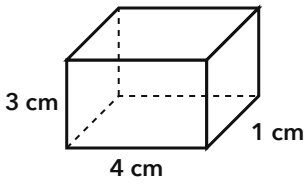
5.GR.C.4 "Identify volume as an attribute of three-dimensional figures and measure volume by counting cubic units (e.g., non-standard equal-sized units, cubic centimeters, cubic inches, and cubic feet) that fill a figure without gaps or overlaps."

NAME _____ DATE _____

12 CUBIC CENTIMETERS

This prism holds exactly 12 cubes that are each 1 cm on every edge, with no gaps or overlaps. Its volume is 12 cubic centimeters.

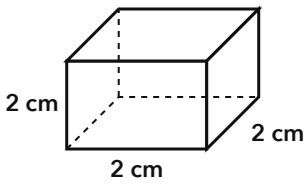
Each layer holds 4 cubes. Three layers hold 12 cubes.



NOT 12 CUBIC CENTIMETERS

This prism holds a number of 1 cm cubes other than 12. Its volume is not 12 cubic centimeters.

Each layer holds 4 cubes. Two layers hold 8 cubes.



1 SORT

8 items

Part 1 SORT: Circle a category for each figure; Part 2 PROVE IT: Choose two figures, one from each category, and explain how counting 1 cm cubes tells you where each belongs.

1.

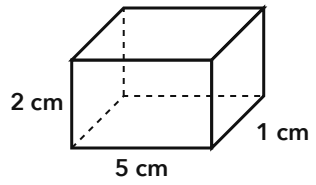


Figure 1

TWELVE OTHER

2.

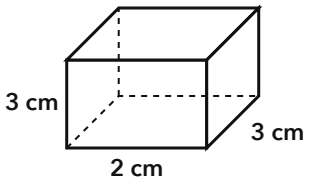


Figure 2

TWELVE OTHER

3.

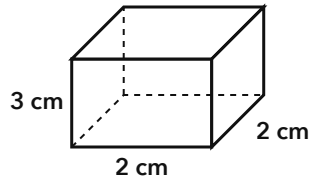


Figure 3

TWELVE OTHER

4.

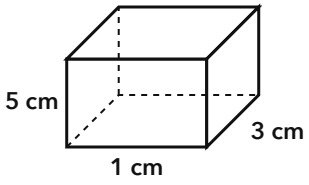


Figure 4

TWELVE OTHER

5.

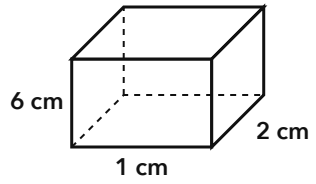


Figure 5

TWELVE OTHER

6.

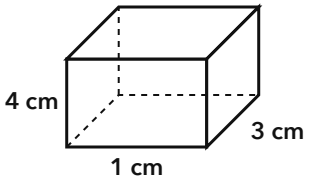


Figure 6

TWELVE OTHER

7.

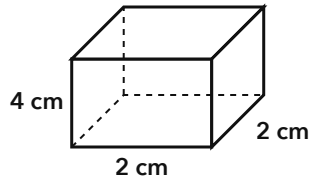


Figure 7

TWELVE OTHER

8.

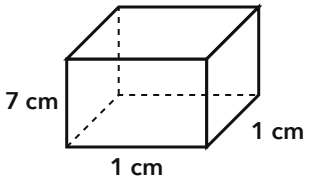


Figure 8

TWELVE OTHER

2 PROVE IT

Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Part 3 MAKE YOUR OWN: Write the length, width, and height in centimeters for one new prism in each category, then give each prism's volume in cubic centimeters.

TWELVE

OTHER

CHALLENGE

A prism is 2 cm long and 3 cm wide. How tall must it be to hold exactly 12 cubes that are each 1 cm on every edge? Explain using layers.

ANSWER KEY

Cube Count Sort

GRADE 5 · 5.GR.C.4

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	Figure 1 (prism)	**OTHER**	Two layers of 5 cubes hold 10 cubes.
2	Figure 2 (prism)	**OTHER**	Three layers of 6 cubes hold 18 cubes.
3	Figure 3 (prism)	**TWELVE**	Three layers of 4 cubes hold 12 cubes.
4	Figure 4 (prism)	**OTHER**	Five layers of 3 cubes hold 15 cubes.
5	Figure 5 (prism)	**TWELVE**	Six layers of 2 cubes hold 12 cubes.
6	Figure 6 (prism)	**TWELVE**	Four layers of 3 cubes hold 12 cubes.
7	Figure 7 (prism)	**OTHER**	Four layers of 4 cubes hold 16 cubes.
8	Figure 8 (prism)	**OTHER**	Seven layers of 1 cube hold 7 cubes.

PART 2 · PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **TWELVE**: 1 cm long, 1 cm wide, and 12 cm high; volume 12 cubic centimeters.
- **OTHER**: 2 cm long, 2 cm wide, and 5 cm high; volume 20 cubic centimeters.

Challenge: Each 1 cm layer holds 6 cubes, so the prism needs 2 layers. It must be 2 cm tall.

For Part 2, look for a count of cubes in one layer and the number of layers for each chosen figure. Counts must describe a complete fill with no gaps or overlaps.