Cube Count Sort

Count each layer to find how many cubes fill a box.

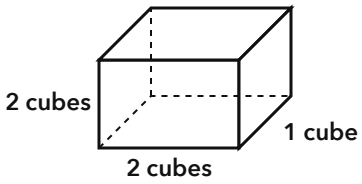
3.GM.2.3 "Count cubes systematically to identify the number of cubes needed to pack the whole or half of a three-dimensional structure."

NAME _____ DATE _____

12 CUBES OR FEWER

Find how many cubes fit in one bottom layer. Then count all the layers. A SMALL box takes 12 cubes or fewer to fill.

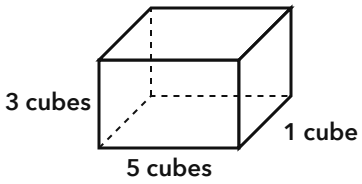
This box takes 4 cubes: 2 in each layer and 2 layers.



MORE THAN 12 CUBES

Find how many cubes fit in one bottom layer. Then count all the layers. A LARGE box takes more than 12 cubes to fill.

This box takes 15 cubes: 5 in each layer and 3 layers.



1 SORT

8 items

Use the edge numbers to count the cubes that fill each figure, then circle SMALL or LARGE.

1.

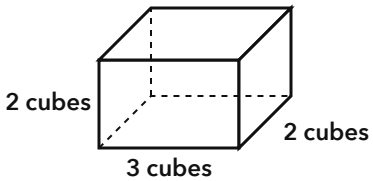


Figure 1

SMALL LARGE

2.

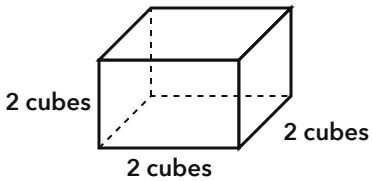


Figure 2

SMALL LARGE

3.

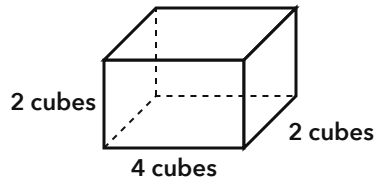


Figure 3

SMALL LARGE

4.

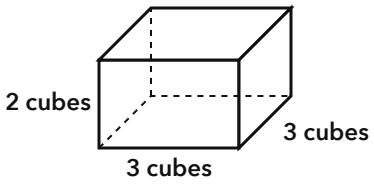


Figure 4

SMALL LARGE

5.

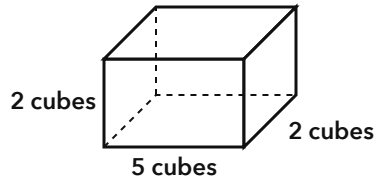


Figure 5

SMALL LARGE

6.

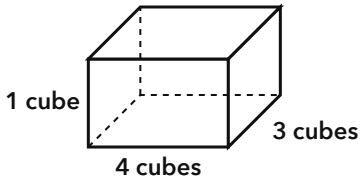


Figure 6

SMALL LARGE

7.

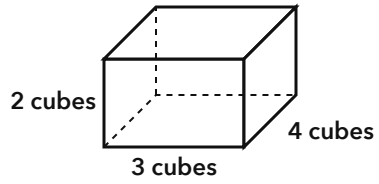


Figure 7

SMALL LARGE

8.

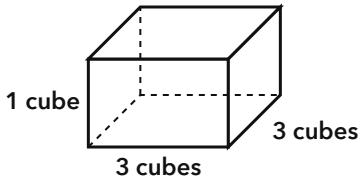


Figure 8

SMALL LARGE

2 PROVE IT

Explain your thinking

Pick two figures, one from each group, and explain how you counted their cubes.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Write three edge lengths for one new SMALL box and one new LARGE box, then tell how many cubes fill each box.

SMALL _____

LARGE _____

CHALLENGE

Pick a figure with an even number of cubes. How many cubes would fill half of it? Explain using layers.

ANSWER KEY # Cube Count Sort

GRADE 3 · 3.GM.2.3

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	Figure 1 (prism)	**SMALL**	Each layer has 3 × 2 = 6 cubes, and 2 layers need 12 cubes.
2	Figure 2 (prism)	**SMALL**	Each layer has 2 × 2 = 4 cubes, and 2 layers need 8 cubes.
3	Figure 3 (prism)	**LARGE**	Each layer has 4 × 2 = 8 cubes, and 2 layers need 16 cubes.
4	Figure 4 (prism)	**LARGE**	Each layer has 3 × 3 = 9 cubes, and 2 layers need 18 cubes.
5	Figure 5 (prism)	**LARGE**	Each layer has 5 × 2 = 10 cubes, and 2 layers need 20 cubes.
6	Figure 6 (prism)	**SMALL**	The single layer has 4 × 3 = 12 cubes.
7	Figure 7 (prism)	**LARGE**	Each layer has 3 × 4 = 12 cubes, and 2 layers need 24 cubes.
8	Figure 8 (prism)	**SMALL**	The single layer has 3 × 3 = 9 cubes.

PART 2 · PROVE IT

Task: Pick two figures, one from each group, and explain how you counted their cubes.
Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **SMALL**: A box that is 2 cubes by 3 cubes by 1 cube needs 6 cubes, so it is SMALL.
- **LARGE**: A box that is 4 cubes by 4 cubes by 1 cube needs 16 cubes, so it is LARGE.

Challenge: Figure 4 needs 18 cubes. Half needs 9 cubes because each of its two layers holds 9 cubes.

For PROVE IT, accept any two figures from different groups with correct layer counts. For example, Figure 1 has 6 cubes in each of 2 layers, or 12 cubes; Figure 3 has 8 cubes in each of 2 layers, or 16 cubes.