LESSON MAKER PRO

Cube Packing Plans

Count the unit cubes that fill each solid.

GRADE 5 · 5.M.B.18.a

5.M.B.18.a "Pack a solid figure without gaps or overlaps using n unit cubes to demonstrate volume as n cubic units."

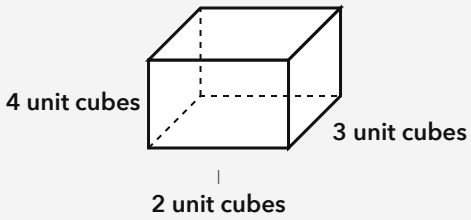
NAME _____ DATE _____

COUNT BY LAYERS

A unit cube has edges 1 unit long and takes up 1 cubic unit of space. To pack a rectangular prism without gaps or overlaps, find the number of cubes in one layer, then multiply by the number of layers.

WORKED EXAMPLE

How many unit cubes pack the solid shown?

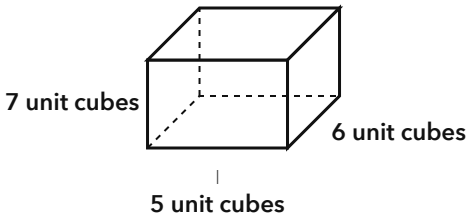


1. 2 × 3 = 6 cubes in each layer.
2. 6 × 4 = 24 cubes in all.
3. Each cube takes up 1 cubic unit.

Answer: 24 cubic units

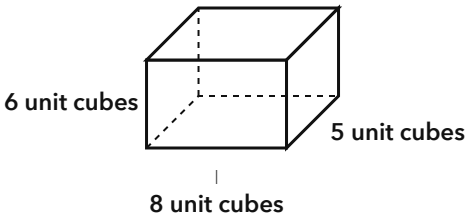
PRACTICE 6 problems

1 How many unit cubes pack the solid shown?



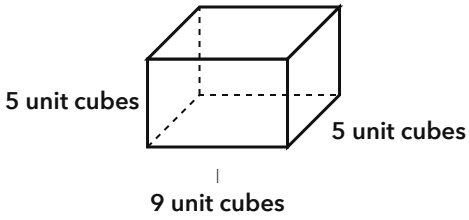
ANSWER _____

2 How many unit cubes fit in each layer of the solid shown?



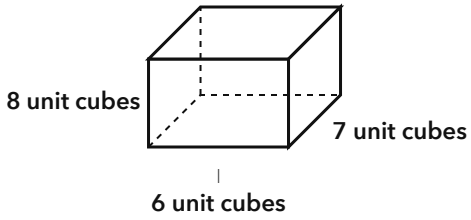
ANSWER _____

3 How many unit cubes pack the solid shown?



ANSWER _____

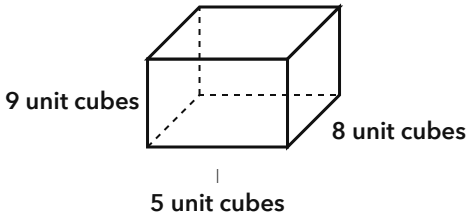
4 You have 300 unit cubes. Can you pack the solid shown without gaps? State how many more cubes you need or how many you will have left.



ANSWER _____

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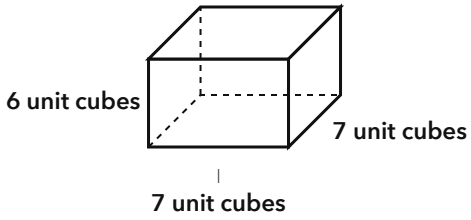
5 How many unit cubes fit in one bottom layer of the solid shown? How many pack the whole solid?



ANSWER _____

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6 A student counts 7 × 7 = 49 cubes in the solid shown. What part of the solid did the student count? How many cubes pack the whole solid?

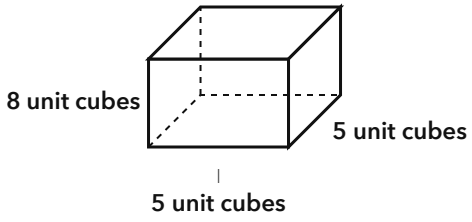


ANSWER _____

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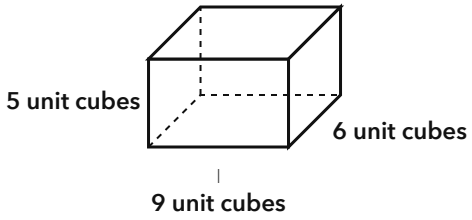
APPLY IT Show your work

1 A board game has a box shaped like the solid shown. Each game piece is a unit cube. How many pieces can fill the box without gaps or overlaps?



ANSWER _____

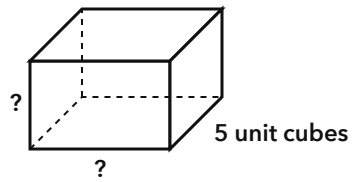
2 For a school fair, you build a display shaped like the solid shown using unit-cube blocks. You have 260 blocks. How many more blocks do you need to fill the display?



ANSWER _____

CHALLENGE One step up

The solid shown must hold exactly 600 unit cubes. Keep its width the same. Find two different pairs of whole-number lengths and heights that will work. Explain how you know.



WORK SPACE AND ANSWER

ANSWER KEY

Cube Packing Plans

GRADE 5 · 5.M.B.18.a

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	How many unit cubes pack the solid shown?	**210 cubic units**
2	How many unit cubes fit in each layer of the solid shown?	**40 cubes**
3	How many unit cubes pack the solid shown?	**225 cubic units**
4	You have 300 unit cubes. Can you pack the solid shown without gaps? State how many more cubes you need or how many you will have left.	**No. You need 36 more cubes.**
5	How many unit cubes fit in one bottom layer of the solid shown? How many pack the whole solid?	**40 cubes in one bottom layer; 360 cubic units in the whole solid**
6	A student counts 7 × 7 = 49 cubes in the solid shown. What part of the solid did the student count? How many cubes pack the whole solid?	**One bottom layer; 294 cubic units in the whole solid**

PART 2 · APPLY IT

1. **200 pieces** Each layer holds 5 × 5 = 25 pieces. Eight layers hold 25 × 8 = 200 pieces.
2. **10 more blocks** The display holds 9 × 6 × 5 = 270 blocks. Subtract 260 from 270 to find that 10 more blocks are needed.

CHALLENGE

Possible pairs are length 6 and height 20, and length 8 and height 15. Both work because 6 × 5 × 20 = 600 and 8 × 5 × 15 = 600.

Accept cube counts stated as either unit cubes or cubic units when the meaning is clear. For the challenge, accept any two distinct pairs of positive whole-number lengths and heights whose product is 120.