LESSON MAKER PRO

Cube Packing Puzzle

Count layers to find volume

GRADE 6 · 6.GR.A.2.a

6.GR.A.2.a "By packing prisms with unit cubes and using estimation to show that the volume can be found by multiplying the edge lengths of the prism."

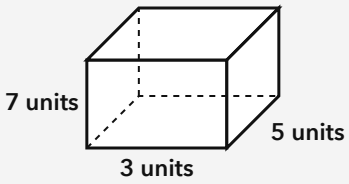
NAME _____ DATE _____

COUNT THE LAYERS

Each unit cube takes 1 cubic unit of space. Estimate how many cubes fit, then multiply length x width to count one layer and multiply by height to count all the layers.

WORKED EXAMPLE

How many unit cubes fit in the prism shown?



1. One layer holds 3 x 5 = 15 cubes.
2. Estimate: 7 layers of about 15 cubes is about 100 cubes.
3. Exact count: 15 x 7 = 105 cubes.

Answer: 105 unit cubes, or 105 cubic units

PRACTICE 4 problems

1 A prism is 2 units long, 4 units wide, and 6 units high. Find its volume.

ANSWER _____

2 A prism is 4 units long, 6 units wide, and 8 units high. Find its volume.

ANSWER _____

3 A prism is 2 units long, 9 units wide, and 10 units high. Find its volume.

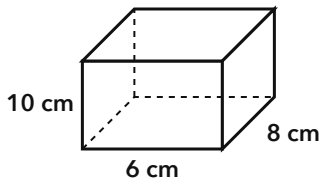
ANSWER _____

4 A prism is 4 units long, 8 units wide, and 11 units high. Find its volume.

ANSWER _____

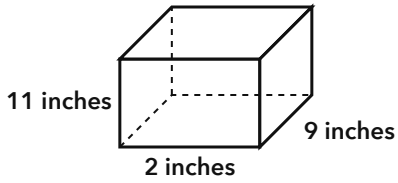
APPLY IT Show your work

1 A game store packs 1-cm cubes in the box shown. How many fit without gaps?



ANSWER _____

2 A craft club fills the case shown with 1-inch cubes. How many fit?



ANSWER _____

CHALLENGE One step up

A prism has 8 layers of 36 unit cubes. Each layer is 9 cubes long. About how many cubes fit, to the nearest hundred? How wide is each layer?

WORK SPACE AND ANSWER

ANSWER KEY

Cube Packing Puzzle

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A prism is 2 units long, 4 units wide, and 6 units high. Find its volume.	**48 cubic units**
2	A prism is 4 units long, 6 units wide, and 8 units high. Find its volume.	**192 cubic units**
3	A prism is 2 units long, 9 units wide, and 10 units high. Find its volume.	**180 cubic units**
4	A prism is 4 units long, 8 units wide, and 11 units high. Find its volume.	**352 cubic units**

PART 2 · APPLY IT

1. **480 cubes** Each layer holds 6 x 8 = 48 cubes. Ten layers hold 48 x 10 = 480 cubes.
2. **198 cubes** Each layer holds 2 x 9 = 18 cubes. Eleven layers hold 18 x 11 = 198 cubes.

CHALLENGE

About 300 cubes; 4 cubes wide. The exact count is 8 x 36 = 288 cubes, and 36 / 9 = 4.

Accept volumes stated as a count of unit cubes or in cubic units. For the challenge, accept 4 units for the width.