

Cube Space Quest

Find how many unit cubes fill each prism.

GRADE 5 • 5.GSR.8.3

5.GSR.8.3 "Investigate volume of right rectangular prisms by packing them with unit cubes without gaps or overlaps. Then, determine the total volume to solve problems."

NAME _____

DATE _____

PACK, THEN MULTIPLY

A right rectangular prism can be filled with unit cubes in equal rows, columns, and layers. Multiply the number of cubes in one layer by the number of layers to find the volume in cubic units.

WORKED EXAMPLE

A right rectangular prism is 5 cubes long, 6 cubes wide, and 7 cubes high. What is its volume?

1. Find the cubes in one layer: $5 \times 6 = 30$.
2. Multiply by the number of layers: $30 \times 7 = 210$.
3. The prism holds 210 unit cubes.

Answer: 210 cubic units

PRACTICE 6 problems

- 1** A right rectangular prism is 2 cubes long, 3 cubes wide, and 4 cubes high. What is its volume?

ANSWER _____

- 2** Each layer of a prism has 8 rows of 3 unit cubes. The prism has 2 layers. What is its volume?

ANSWER _____

- 3** A prism is 4 cubes long, 4 cubes wide, and 9 cubes high. How many unit cubes fill it?

ANSWER _____

- 4** A prism has 3 layers. Each layer is 8 cubes long and 4 cubes wide. What is its volume?

ANSWER _____

- 5** A right rectangular prism is 9 cubes long, 2 cubes wide, and 8 cubes high. What is its volume?

ANSWER _____

- 6** A prism is 1 cube long, 9 cubes wide, and 8 cubes high. How many unit cubes fill it?

ANSWER _____

APPLY IT Show your work

- 1** A student is building a storage box for trading cards. The inside can be packed with unit cubes in 12 rows, 3 cubes across each row, and 4 layers. What is the volume of the box?

WORK SPACE

ANSWER _____

- 2** At a robotics club, a battery case is 9 cubes long, 8 cubes wide, and 2 cubes high. How many unit cubes would fill the case?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Prism A is 2 cubes by 4 cubes by 12 cubes. Prism B is 3 cubes by 4 cubes by 8 cubes. Do the prisms hold the same number of unit cubes? Explain in 2 sentences.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A right rectangular prism is 2 cubes long, 3 cubes wide, and 4 cubes high. What is its volume?	24 cubic units
2	Each layer of a prism has 8 rows of 3 unit cubes. The prism has 2 layers. What is its volume?	48 cubic units
3	A prism is 4 cubes long, 4 cubes wide, and 9 cubes high. How many unit cubes fill it?	144 unit cubes
4	A prism has 3 layers. Each layer is 8 cubes long and 4 cubes wide. What is its volume?	96 cubic units
5	A right rectangular prism is 9 cubes long, 2 cubes wide, and 8 cubes high. What is its volume?	144 cubic units
6	A prism is 1 cube long, 9 cubes wide, and 8 cubes high. How many unit cubes fill it?	72 unit cubes

PART 2 • APPLY IT

- 144 cubic units** There are $12 \times 3 = 36$ cubes in one layer. Multiply 36×4 to get 144 cubic units.
- 144 unit cubes** Multiply the three dimensions: $9 \times 8 \times 2 = 144$. The case holds 144 unit cubes.

CHALLENGE

Both prisms hold 96 cubes because $2 \times 4 \times 12 = 96$ and $3 \times 4 \times 8 = 96$. Their dimensions differ, but each is packed with the same total number of unit cubes.

Accept answers stated as cubic units or unit cubes. For the challenge, accept any two-sentence explanation that correctly shows both products equal 96.