

Stack It Up

Use layers and multiplication to find volume.

GRADE 5 • MA.5.GR.3.2

MA.5.GR.3.2 "Find the volume of a right rectangular prism with whole-number side lengths using a visual model and a formula."

NAME _____

DATE _____

BUILD VOLUME IN LAYERS

A right rectangular prism is made of equal-size unit cubes. Find the number of cubes in one layer by multiplying length $\times$ width, then multiply by the number of layers, or height. The formula is $V = l \times w \times h$.

WORKED EXAMPLE

A prism has 6 layers. Each layer has 3 rows of 2 unit cubes. Find the volume.

1. Find cubes in one layer: $3 \times 2 = 6$.
2. Multiply by the layers: $6 \times 6 = 36$.
3. Use the formula: $V = 3 \times 2 \times 6$.

Answer: 36 cubic units

PRACTICE 6 problems

- 1** Use the layer model. Each layer is 5 cubes by 7 cubes, and the prism has 4 equal layers. What is the volume?

ANSWER _____

- 2** Find the volume of a right rectangular prism with a length of 8 units, a width of 4 units, and a height of 5 units.

ANSWER _____

- 3** A prism has 9 cubes in each row, 4 rows in each layer, and 7 layers. What is its volume?

ANSWER _____

- 4** Find the volume of a right rectangular prism that is 5 units long, 8 units wide, and 7 units high.

ANSWER _____

- 5** Use $V = l \times w \times h$. Find the volume when $l = 9$ units, $w = 5$ units, and $h = 7$ units.

ANSWER _____

- 6** The base of a prism is 7 units by 7 units. The prism is 4 units high. What is the volume?

ANSWER _____

APPLY IT Show your work

- 1** A game club packs small prizes into a rectangular box that is 8 inches long, 5 inches wide, and 7 inches high. What is the volume of the box?

WORK SPACE

ANSWER _____

- 2** A class makes a rectangular display case for collecting trading cards. The case is 9 centimeters long, 4 centimeters wide, and 7 centimeters high. What is its volume?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A rectangular prism has a volume of 280 cubic centimeters. Its length is 8 centimeters and its width is 5 centimeters. What is its height? Explain how you know.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Use the layer model. Each layer is 5 cubes by 7 cubes, and the prism has 4 equal layers. What is the volume?	140 cubic units
2	Find the volume of a right rectangular prism with a length of 8 units, a width of 4 units, and a height of 5 units.	160 cubic units
3	A prism has 9 cubes in each row, 4 rows in each layer, and 7 layers. What is its volume?	252 cubic units
4	Find the volume of a right rectangular prism that is 5 units long, 8 units wide, and 7 units high.	280 cubic units
5	Use $V = l \times w \times h$. Find the volume when $l = 9$ units, $w = 5$ units, and $h = 7$ units.	315 cubic units
6	The base of a prism is 7 units by 7 units. The prism is 4 units high. What is the volume?	196 cubic units

PART 2 • APPLY IT

- 280 cubic inches** Multiply the three side lengths: $8 \times 5 \times 7 = 280$. The box holds 280 cubic inches.
- 252 cubic centimeters** Multiply length, width, and height: $9 \times 4 \times 7 = 252$. The volume is 252 cubic centimeters.

CHALLENGE

7 centimeters. The base has $8 \times 5 = 40$ square centimeters, and $280 \div 40 = 7$ layers.

Accept multiplication in any order and correct numerical answers with the appropriate cubic unit. For the challenge, accept a clear explanation that finds the base area and divides the volume by that area.