

Build the Volume

Use layers and edge lengths to find cubic units.

GRADE 5 • NY-5.MD.5.a

NY-5.MD.5.a "Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths..."

NAME _____

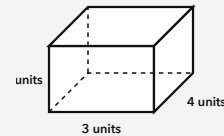
DATE _____

LAYERS MAKE VOLUME

A right rectangular prism can be packed with equal layers of unit cubes. Multiply the length by the width to find the cubes in one layer, then multiply by the height. This is the same as multiplying the area of the base by the height.

WORKED EXAMPLE

Find the volume of the prism shown.
Show the layer method and the edge-length multiplication.

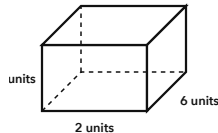


1. One base layer has $3 \times 4 = 12$ unit cubes.
2. The prism has 5 equal layers.
3. $12 \times 5 = 60$ unit cubes.
4. $3 \times 4 \times 5 = 60$ cubic units.

Answer: 60 cubic units

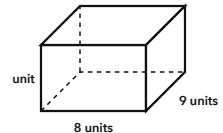
PRACTICE 6 problems

- 1** What is the volume of the prism shown?



ANSWER _____

- 2** How many unit cubes fill the prism shown?



ANSWER _____

- 3** A rectangular prism is 10 units long, 2 units wide, and 11 units high. Find its volume.

ANSWER _____

- 4** A rectangular prism is 12 units long, 7 units wide, and 2 units high. Find its volume.

ANSWER _____

- 5** A prism has a base area of 56 square units and a height of 9 units. Find its volume.

ANSWER _____

- 6** A rectangular prism has a base that is 7 units by 8 units. Its height is 6 units. Find its volume.

ANSWER _____

APPLY IT Show your work

- 1** For a school game club, Eli builds a rectangular prize box that is 9 cm long, 7 cm wide, and 8 cm high. What is the volume of the box?

WORK SPACE

ANSWER _____

- 2** The garden club fills a rectangular planter box with soil. The inside is 12 cm long, 6 cm wide, and 7 cm deep. What volume of soil can the planter hold?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A right rectangular prism has a volume of 864 cubic units. Its base is 12 units by 8 units. What is its height? Explain why multiplying the base area by your height gives the volume.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	What is the volume of the prism shown?	84 cubic units
2	How many unit cubes fill the prism shown?	72 unit cubes
3	A rectangular prism is 10 units long, 2 units wide, and 11 units high. Find its volume.	220 cubic units
4	A rectangular prism is 12 units long, 7 units wide, and 2 units high. Find its volume.	168 cubic units
5	A prism has a base area of 56 square units and a height of 9 units. Find its volume.	504 cubic units
6	A rectangular prism has a base that is 7 units by 8 units. Its height is 6 units. Find its volume.	336 cubic units

PART 2 • APPLY IT

1. **504 cm³** Multiply the base dimensions: $9 \times 7 = 63$ square centimeters. Multiply by the height: $63 \times 8 = 504 \text{ cm}^3$.
2. **504 cm³** The base area is $12 \times 6 = 72$ square centimeters. Multiply 72×7 to get 504 cm^3 .

CHALLENGE

Height = 9 units; the base area is $12 \times 8 = 96$ square units, and $96 \times 9 = 864$ cubic units.

Accept any correct multiplication order, such as length $\times$ width $\times$ height or base area $\times$ height. For the challenge, students should identify a height of 9 units and connect 96×9 to the given volume.