

Volume Vault

Find prism volume and missing edge lengths.

GRADE 5 • MA.5.GR.3.3

MA.5.GR.3.3 "Solve real-world problems involving the volume of right rectangular prisms, including problems with an unknown edge length, with whole-number edge lengths using a visual model or a formula..."

NAME _____

DATE _____

USE THE VOLUME FORMULA

To find the volume of a right rectangular prism, multiply its length, width, and height: $V = l \times w \times h$. If one edge is unknown, use a letter such as n , write an equation, and divide the volume by the product of the known edges.

WORKED EXAMPLE

A rectangular prism is 13 units long, 15 units wide, and 17 units high. Find its volume.

1. Use $V = l \times w \times h$.
2. $V = 13 \times 15 \times 17$.
3. $13 \times 15 = 195$, and $195 \times 17 = 3,315$.

Answer: 3,315 cubic units

PRACTICE 6 problems

- 1** 1. Find the volume of a rectangular prism that is 4 cm long, 6 cm wide, and 7 cm high.

ANSWER _____

- 2** 2. A rectangular prism has a volume of 180 cubic units. It is 9 units long and 5 units wide. Its height is n units. Write and solve an equation for n .

ANSWER _____

- 3** 3. Find the volume of a rectangular prism that is 11 m long, 4 m wide, and 6 m high.

ANSWER _____

- 4** 4. A rectangular prism has a volume of 336 cubic inches. It is 7 inches long and 6 inches wide. Its height is n inches. Write and solve an equation for n .

ANSWER _____

- 5** 5. Find the volume of a rectangular prism that is 10 units long, 9 units wide, and 4 units high.

ANSWER _____

- 6** 6. A rectangular prism has a volume of 432 cubic feet. It is 12 feet long and 6 feet wide. Its height is n feet. Write and solve an equation for n .

ANSWER _____

APPLY IT Show your work

- 1** A student is building a rectangular storage bin for art supplies. The bin is 14 inches long, 5 inches wide, and 6 inches high. What is the volume of the bin?

WORK SPACE

ANSWER _____

- 2** A gaming display case has a volume of 540 cubic inches. It is 9 inches long and 10 inches wide. The height is n inches. Write and solve an equation to find the height.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Two identical rectangular snack boxes together hold 576 cubic inches. Each box is 9 inches long, 4 inches wide, and n inches high. Write and solve an equation to find the height of each box.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	1. Find the volume of a rectangular prism that is 4 cm long, 6 cm wide, and 7 cm high.	168 cubic cm
2	2. A rectangular prism has a volume of 180 cubic units. It is 9 units long and 5 units wide. Its height is n units. Write and solve an equation for n .	$9 * 5 * n = 180$; $n = 4$ units
3	3. Find the volume of a rectangular prism that is 11 m long, 4 m wide, and 6 m high.	264 cubic m
4	4. A rectangular prism has a volume of 336 cubic inches. It is 7 inches long and 6 inches wide. Its height is n inches. Write and solve an equation for n .	$7 * 6 * n = 336$; $n = 8$ inches
5	5. Find the volume of a rectangular prism that is 10 units long, 9 units wide, and 4 units high.	360 cubic units
6	6. A rectangular prism has a volume of 432 cubic feet. It is 12 feet long and 6 feet wide. Its height is n feet. Write and solve an equation for n .	$12 * 6 * n = 432$; $n = 6$ feet

PART 2 • APPLY IT

- 420 cubic inches** Multiply the three edge lengths: $14 * 5 * 6 = 420$.
- $9 * 10 * n = 540$; $n = 6$ inches** The known length and width make a base area of 90 square inches. Divide 540 by 90 to find $n = 6$.

CHALLENGE

$2 * 9 * 4 * n = 576$; $n = 8$ inches

Accept equivalent equations with factors in any order, such as $n * 9 * 5 = 180$. Accept cubic unit labels written as cubic cm, cm^3 , cubic inches, or in^3 .