

Build Volume Totals

Split, multiply, and add prism volumes.

GRADE 5 • NY-5.MD.5.c

NY-5.MD.5.c "Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems."

NAME _____

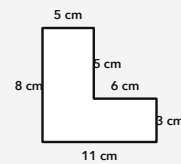
DATE _____

ADD THE PARTS

Split a solid into right rectangular prisms that do not overlap. Find each volume by multiplying length $\times$ width $\times$ height, then add the volumes.

WORKED EXAMPLE

The L-shaped base is shown. It is 4 cm deep. Find its volume.



1. Split the base into an 11 cm by 3 cm rectangle and a 5 cm by 5 cm rectangle.
2. Find each prism: $11 \times 3 \times 4 = 132 \text{ cm}^3$ and $5 \times 5 \times 4 = 100 \text{ cm}^3$.
3. Add: $132 + 100 = 232 \text{ cm}^3$.

Answer: 232 cm^3

PRACTICE 4 problems

- 1** A solid has two non-overlapping prisms. Prism A is 7 cm by 2 cm by 9 cm. Prism B is 10 cm by 2 cm by 9 cm. Find the total volume.

ANSWER _____

- 2** Find the volume of a solid made from two non-overlapping prisms: 12 cm by 7 cm by 2 cm and 9 cm by 7 cm by 2 cm.

ANSWER _____

- 3** Two non-overlapping prisms make one solid. Their dimensions are 14 cm by 2 cm by 7 cm and 15 cm by 2 cm by 7 cm. Find the total volume.

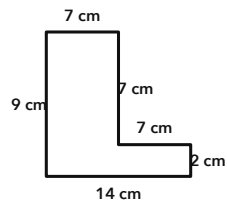
ANSWER _____

- 4** A solid is made by joining a 7 cm by 10 cm by 2 cm prism to a 12 cm by 10 cm by 2 cm prism. Find the total volume. Explain why you add.

ANSWER _____

APPLY IT Show your work

- 1** Mia makes an L-shaped platform for a board-game display. The base is shown. It is 10 cm deep. What is its volume?



ANSWER _____

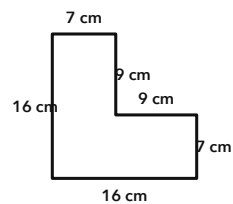
- 2** For a school garden, two non-overlapping rectangular soil bins sit side by side. One is 15 cm long, 12 cm wide, and 2 cm high. The other is 13 cm long, 12 cm wide, and 2 cm high. What total volume of soil can they hold?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A maker builds a two-step wooden stand whose front face is shown. The stand is 12 cm deep. Find its total volume. Show the dimensions of the two prisms you added.



WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A solid has two non-overlapping prisms. Prism A is 7 cm by 2 cm by 9 cm. Prism B is 10 cm by 2 cm by 9 cm. Find the total volume.	306 cm³
2	Find the volume of a solid made from two non-overlapping prisms: 12 cm by 7 cm by 2 cm and 9 cm by 7 cm by 2 cm.	294 cm³
3	Two non-overlapping prisms make one solid. Their dimensions are 14 cm by 2 cm by 7 cm and 15 cm by 2 cm by 7 cm. Find the total volume.	406 cm³
4	A solid is made by joining a 7 cm by 10 cm by 2 cm prism to a 12 cm by 10 cm by 2 cm prism. Find the total volume. Explain why you add.	380 cm³; the prisms do not overlap, so their volumes add.

PART 2 • APPLY IT

- 770 cm³** Split it into a 14 cm by 2 cm by 10 cm prism and a 7 cm by 7 cm by 10 cm prism. Add 280 cm³ and 490 cm³.
- 672 cm³** Find $15 \times 12 \times 2 = 360 \text{ cm}^3$ and $13 \times 12 \times 2 = 312 \text{ cm}^3$. Add the two volumes.

CHALLENGE

2,100 cm³; 16 cm × 7 cm × 12 cm and 7 cm × 9 cm × 12 cm.

Accept any correct split into two non-overlapping rectangular prisms. Require cubic centimeters and addition of the two part volumes.