LESSON MAKER PRO

Build the Volume

Find the volume of solids made from right prisms.

GRADE 7 · 7.G.6b

7.G.6b "Solve real-world and mathematical problems involving: Volume of objects composed only of right prisms having triangular or quadrilateral bases."

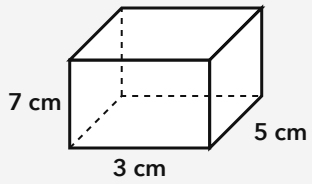
NAME _____ DATE _____

ADD THE PARTS

Find a right prism's volume by multiplying the area of its base by its length. A rectangular base has area length × width, and a triangular base has area base × perpendicular height / 2. If prisms touch but do not overlap, add their volumes.

WORKED EXAMPLE

Four identical rectangular blocks shaped like the one shown are joined without overlapping. What is their total volume?

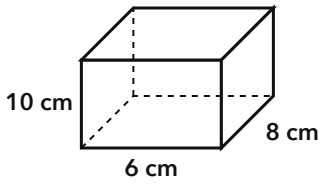


1. Find one block's volume: $3 \times 5 \times 7 = 105$ cm^3.
2. Find the total: $4 \times 105 = 420$ cm^3.

Answer: 420 cm^3

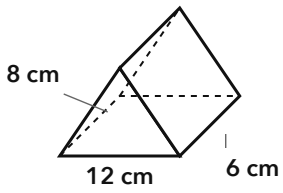
PRACTICE 6 problems

1 What is the volume of the rectangular prism shown?



ANSWER _____

2 In the figure, b and h measure the triangular face, and l is the distance between the triangular faces. What is the prism's volume?



ANSWER _____

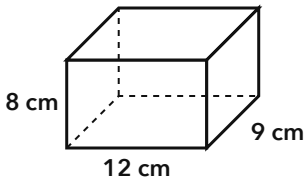
3 Two rectangular prisms are joined along a face without overlapping. One measures 6 cm by 8 cm by 10 cm. The other measures 6 cm by 8 cm by 12 cm. What is their total volume?

ANSWER _____

4 A right triangular prism and a rectangular prism touch but do not overlap. The triangular face has a base of 14 cm and a perpendicular height of 6 cm. That prism is 8 cm long. The rectangular prism measures 9 cm by 8 cm by 6 cm. What is their total volume?

ANSWER _____

5 A model is built from two identical rectangular prisms like the one shown. They touch but do not overlap. What is the model's volume?



ANSWER _____

6 A solid is made by stacking a rectangular prism measuring 18 cm by 10 cm by 6 cm on one measuring 18 cm by 10 cm by 8 cm. The prisms do not overlap. What is the solid's volume?

ANSWER _____

APPLY IT Show your work

1 A game club makes a trophy by joining a rectangular prism measuring 12 cm by 8 cm by 6 cm and a right triangular prism. The triangular face has a base of 8 cm and a perpendicular height of 6 cm, and the prism is 12 cm long. The pieces do not overlap. What is the trophy's volume?

WORK SPACE

ANSWER _____

2 A skate park designer plans a solid ramp made from a rectangular prism and a right triangular prism that touch without overlapping. The rectangular prism measures 16 ft by 10 ft by 6 ft. The triangular face has a base of 10 ft and a perpendicular height of 6 ft, and that prism is 16 ft long. What is the ramp's volume?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A display block starts with a rectangular prism measuring 20 cm by 12 cm by 8 cm joined to a right triangular prism without overlap. The triangular face has a base of 12 cm and a perpendicular height of 8 cm, and that prism is 20 cm long. A rectangular prism measuring 6 cm by 8 cm by 10 cm is cut from the rectangular part. What volume remains? Show how you use addition and subtraction.

WORK SPACE AND ANSWER

ANSWER KEY

Build the Volume

GRADE 7 · 7.G.6b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	What is the volume of the rectangular prism shown?	**480 cm^3**
2	In the figure, b and h measure the triangular face, and l is the distance between the triangular faces. What is the prism's volume?	**288 cm^3**
3	Two rectangular prisms are joined along a face without overlapping. One measures 6 cm by 8 cm by 10 cm. The other measures 6 cm by 8 cm by 12 cm. What is their total volume?	**1,056 cm^3**
4	A right triangular prism and a rectangular prism touch but do not overlap. The triangular face has a base of 14 cm and a perpendicular height of 6 cm. That prism is 8 cm long. The rectangular prism measures 9 cm by 8 cm by 6 cm. What is their total volume?	**768 cm^3**
5	A model is built from two identical rectangular prisms like the one shown. They touch but do not overlap. What is the model's volume?	**1,728 cm^3**
6	A solid is made by stacking a rectangular prism measuring 18 cm by 10 cm by 6 cm on one measuring 18 cm by 10 cm by 8 cm. The prisms do not overlap. What is the solid's volume?	**2,520 cm^3**

PART 2 · APPLY IT

1. **864 cm^3** The rectangular prism has volume 576 cm^3, and the triangular prism has volume 288 cm^3. Add them to get 864 cm^3.
2. **1,440 ft^3** The rectangular prism has volume 960 ft^3, and the triangular prism has volume 480 ft^3. Their total is 1,440 ft^3.

CHALLENGE

2,400 cm^3. Add the original volumes, then subtract the cutout: (20 × 12 × 8) + (12 × 8 / 2 × 20) − (6 × 8 × 10) = 2,400.

Accept equivalent multiplication expressions and correctly labeled cubic units. For the challenge, students should add both original prism volumes before subtracting the removed volume.