LESSON MAKER PRO

Prism Cover and Fill

Find what covers a prism and what fits inside.

GRADE 7 · 7.GM.1

7.GM.1 "Develop and understand the concept of surface area and volume of rectangular prisms with rational-valued edge lengths. Recognize that the surface area of a rectangular prism can be found by finding the area of each component of the net of..."

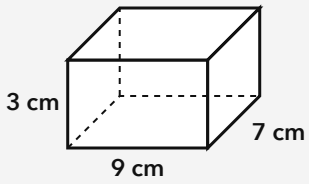
NAME _____ DATE _____

COVER OR FILL?

Surface area counts the square units needed to cover all six faces without gaps or overlaps. Add the areas of the three different face pairs, then double the sum: surface area = 2(lw + lh + wh). Volume counts the unit cubes that fill the prism without gaps or overlaps: volume = lwh.

WORKED EXAMPLE

Find the surface area and volume of the prism shown.

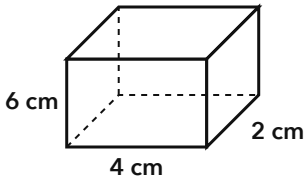


1. Find the three different face areas: $9 \times 7 = 63$, $9 \times 3 = 27$, and $7 \times 3 = 21$ cm^2.
2. Double their sum: $2(63 + 27 + 21) = 222$ cm^2.
3. Multiply the edge lengths: $9 \times 7 \times 3 = 189$ cm^3.

Answer: Surface area: 222 cm^2; volume: 189 cm^3.

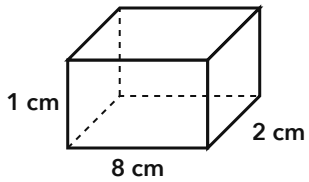
PRACTICE 6 problems

1 What is the surface area of the prism shown?



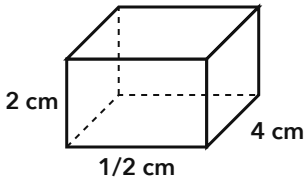
ANSWER _____

2 What is the volume of the prism shown?



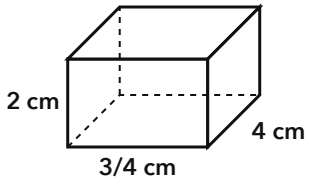
ANSWER _____

3 What is the surface area of the prism shown?



ANSWER _____

4 What is the volume of the prism shown?



ANSWER _____

5 A prism has two faces with area 6 cm^2, two with area 8 cm^2, and two with area 12 cm^2. What is its surface area?

ANSWER _____

6 One prism measures 1 cm by 4 cm by 4 cm. Another measures 2 cm by 2 cm by 5 cm. Find each surface area. Do they match?

ANSWER _____

_____

APPLY IT Show your work

1 A student covers all six outside faces of a closed sticker storage box with paper. The box is 10 cm long, 6 cm wide, and 9/2 cm high. How many square centimeters of paper are needed if there are no gaps or overlaps?

WORK SPACE

ANSWER _____

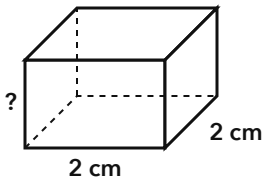
2 A robotics club fills a rectangular case that measures 4 cm by 2 cm by 3/2 cm with tiny cubes. Each cube has edges 1/2 cm long. How many cubes fit without gaps or overlaps?

WORK SPACE

ANSWER _____

CHALLENGE One step up

The closed prism shown has a surface area of 40 cm^2. Find its height and volume. Explain how the face areas give the height.



WORK SPACE AND ANSWER

ANSWER KEY

Prism Cover and Fill

GRADE 7 · 7.GM.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	What is the surface area of the prism shown?	**88 cm^2**
2	What is the volume of the prism shown?	**16 cm^3**
3	What is the surface area of the prism shown?	**22 cm^2**
4	What is the volume of the prism shown?	**6 cm^3**
5	A prism has two faces with area 6 cm^2, two with area 8 cm^2, and two with area 12 cm^2. What is its surface area?	**52 cm^2**
6	One prism measures 1 cm by 4 cm by 4 cm. Another measures 2 cm by 2 cm by 5 cm. Find each surface area. Do they match?	**First prism: 48 cm^2. Second prism: 48 cm^2. Yes, they match.**

PART 2 · APPLY IT

1. **264 cm^2** The three different face areas are 60, 45, and 27 cm^2. Double their sum to get 264 cm^2.
2. **96 cubes** There are 8 cubes along the length, 4 along the width, and 3 along the height. Multiply 8 × 4 × 3 to get 96 cubes.

CHALLENGE

Height: 4 cm; volume: 16 cm^3. The top and bottom have a combined area of 8 cm^2, leaving 32 cm^2 for four equal side faces. Each side face has area 8 cm^2, so its height is 4 cm.

Accept equivalent fractional or decimal forms with correct square or cubic units. For problem 6, students may use either face pairs or the surface area formula to show the two prisms match.