LESSON MAKER PRO

Surface Area Quest

Find the outside area of prisms and cylinders.

GRADE 7 · 7.GSR.5.6

7.GSR.5.6 "Solve realistic problems involving surface area of right prisms and cylinders."

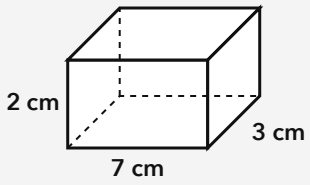
NAME _____ DATE _____

COVER EVERY OUTSIDE FACE

For a closed right prism or cylinder, surface area is the total area of every outside face, including both bases. For a rectangular prism, add the areas of the three different face pairs. For a cylinder, use $2\pi r^2 + 2\pi rh$, where r is the radius and h is the height.

WORKED EXAMPLE

Find the total surface area of the rectangular prism shown.

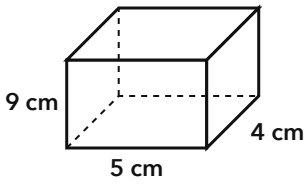


1. Find the three face areas: $7 \times 3 = 21$, $7 \times 2 = 14$, and $3 \times 2 = 6$.
2. Each face area appears twice.
3. $SA = 2(21 + 14 + 6) = 2(41) = 82$ cm^2.
4. The total surface area is 82 cm^2.

Answer: 82 cm^2

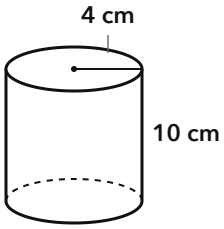
PRACTICE 6 problems

1 Find the total surface area of the rectangular prism shown.



ANSWER _____

2 Find the total surface area of the closed cylinder shown. Leave your answer in terms of π.



ANSWER _____

3 A closed rectangular prism is 8 cm long, 6 cm wide, and 4 cm high. Find its total surface area.

ANSWER _____

4 A closed cylinder has a diameter of 12 cm and a height of 7 cm. Find its total surface area in terms of π.

ANSWER _____

5 A closed right triangular prism has a right-triangle base with side lengths 5 cm, 12 cm, and 13 cm. The prism is 8 cm long. Find its total surface area.

ANSWER _____

6 A closed cube has edge lengths of 11 cm. Find its total surface area.

ANSWER _____

APPLY IT Show your work

1 A student is making a closed rectangular-prism storage box for trading cards. The box is 14 cm long, 9 cm wide, and 5 cm high. How much cardboard is needed to cover the outside of the box?

WORK SPACE

ANSWER _____

2 A reusable water bottle is shaped like a closed cylinder with a radius of 3 cm and a height of 15 cm. How much metal covers the outside of the bottle? Leave your answer in terms of π.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A closed rectangular-prism storage container has a volume of 960 cm^3. Its base is 12 cm by 8 cm. Find the container's height, then find its total surface area. Explain how you used the volume to find the height.

WORK SPACE AND ANSWER

ANSWER KEY # Surface Area Quest

GRADE 7 · 7.GSR.5.6

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the total surface area of the rectangular prism shown.	**202 cm²**
2	Find the total surface area of the closed cylinder shown. Leave your answer in terms of π.	**112π cm²**
3	A closed rectangular prism is 8 cm long, 6 cm wide, and 4 cm high. Find its total surface area.	**208 cm²**
4	A closed cylinder has a diameter of 12 cm and a height of 7 cm. Find its total surface area in terms of π.	**156π cm²**
5	A closed right triangular prism has a right-triangle base with side lengths 5 cm, 12 cm, and 13 cm. The prism is 8 cm long. Find its total surface area.	**300 cm²**
6	A closed cube has edge lengths of 11 cm. Find its total surface area.	**726 cm²**

PART 2 · APPLY IT

1. **482 cm²** Find the three face areas: 14 × 9 = 126, 14 × 5 = 70, and 9 × 5 = 45. Double their sum: $2(126 + 70 + 45) = 482$ cm².
2. **108π cm²** Use $2\pi r^2 + 2\pi rh$. The surface area is $2\pi(3)^2 + 2\pi(3)(15) = 18\pi + 90\pi = 108\pi$ cm².

CHALLENGE

The base area is 12 × 8 = 96 cm², so the height is 960 ÷ 96 = 10 cm. The total surface area is 2(12 × 8 + 12 × 10 + 8 × 10) = 592 cm².

Accept equivalent surface-area expressions and correct units. For cylinder answers, accept answers in terms of π without decimal approximations.