LESSON MAKER PRO

Cover Every Face

Find the surface area of boxes and combined solids.

GRADE 7 · 7.GM.B.22

7.GM.B.22 "Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right rectangular prisms."

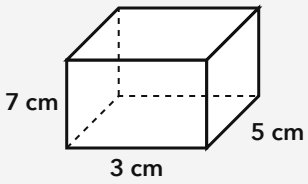
NAME _____ DATE _____

COUNT EXPOSED FACES

A closed rectangular prism has three pairs of equal faces. Find the area of one face in each pair, then double the sum: SA = 2(lw + lh + wh). For an open box or joined solids, count only the faces exposed on the outside.

WORKED EXAMPLE

Find the surface area of the closed prism shown.

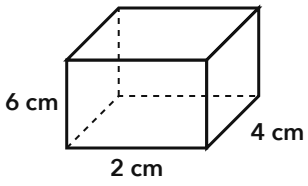


1. Find the three face areas: 3 * 5 = 15, 3 * 7 = 21, and 5 * 7 = 35.
2. Add them: 15 + 21 + 35 = 71.
3. Double the sum: 2 * 71 = 142.

Answer: 142 cm²

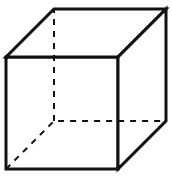
PRACTICE 6 problems

1 Find the surface area of the closed prism shown.



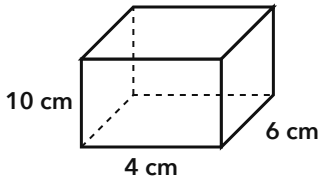
ANSWER _____

2 Find the surface area of the cube shown.



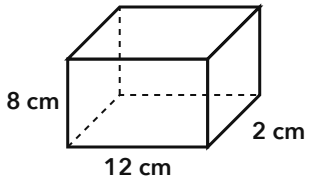
ANSWER _____

3 Find the surface area of the closed prism shown.



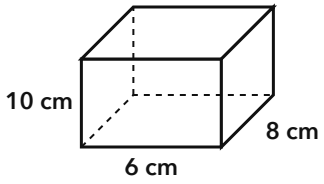
ANSWER _____

4 Find the surface area of the closed prism shown.



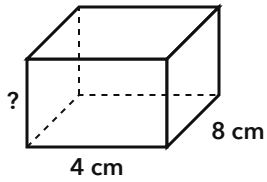
ANSWER _____

5 Find the surface area of the closed prism shown.



ANSWER _____

6 The closed prism shown has a surface area of 208 cm^2. What is its height? Write an equation to show your work.

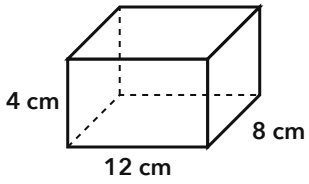


ANSWER _____

_____

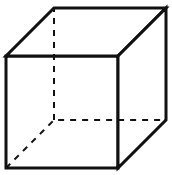
APPLY IT Show your work

1 A collectible figure ships in a closed box with the dimensions shown. How much cardboard covers its six faces? Ignore flaps.



ANSWER _____

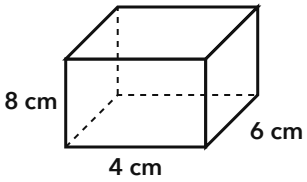
2 A shop uses an open-top cube-shaped box like the one shown to display game dice. How much cardboard makes the bottom and four sides? Ignore seams.



ANSWER _____

CHALLENGE One step up

Two identical blocks like the one shown are joined along their top faces. What is the surface area of the new solid? Explain why the joined faces are not counted.



WORK SPACE AND ANSWER

ANSWER KEY

Cover Every Face

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the surface area of the closed prism shown.	**88 cm^2**
2	Find the surface area of the cube shown.	**384 cm^2**
3	Find the surface area of the closed prism shown.	**248 cm^2**
4	Find the surface area of the closed prism shown.	**272 cm^2**
5	Find the surface area of the closed prism shown.	**376 cm^2**
6	The closed prism shown has a surface area of 208 cm^2. What is its height? Write an equation to show your work.	**6 cm; 2(4 * 8 + 4 * 6 + 8 * 6) = 208.**

PART 2 · APPLY IT

1. **352 cm^2** The three different face areas are 96, 48, and 32 cm^2. Double their sum: 2(96 + 48 + 32) = 352 cm^2.
2. **180 cm^2** Each square face has an area of 6 * 6 = 36 cm^2. The open box has five cardboard faces, so 5 * 36 = 180 cm^2.

CHALLENGE

368 cm^2. Each block has a surface area of 208 cm^2. The two joined faces each have an area of 24 cm^2 and are inside the new solid, so its surface area is 2 * 208 - 2 * 24 = 368 cm^2.

Accept equivalent equations for problem 6 and the challenge. Surface area answers must use square units.