NAME _____ DATE _____ PERIOD _____

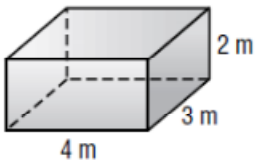
12-4 Study Guide and Intervention

Surface Area of Rectangular Prisms

The sum of the areas of all the surfaces, or faces, of a three-dimensional figure is the **surface area**. The surface area S of a rectangular prism with length ℓ, width w, and height h is found using the following formula.

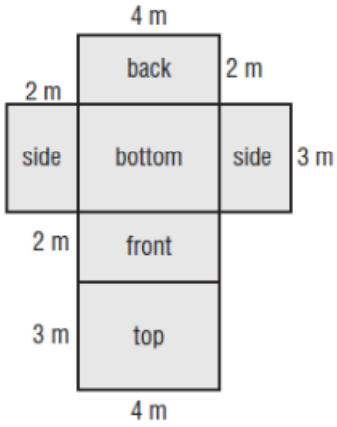
$S = 2\ell w + 2\ell h + 2wh$

Example **Find the surface area of the rectangular prism.**



You can use the net of the rectangular prism to find its surface area. There are three pairs of congruent faces in a rectangular prism:

- top and bottom
- front and back
- two sides



Faces	Area
top and bottom	$(4 \cdot 3) + (4 \cdot 3) = 24$
front and back	$(4 \cdot 2) + (4 \cdot 2) = 16$
two sides	$(2 \cdot 3) + (2 \cdot 3) = 12$
Sum of the areas	$24 + 16 + 12 = 52$

Alternatively, replace ℓ with 4, w with 3, and h with 2 in the formula for surface area.

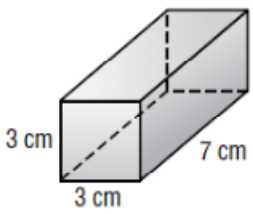
$S = 2\ell w + 2\ell h + 2wh$
$= 2 \cdot 4 \cdot 3 + 2 \cdot 4 \cdot 2 + 2 \cdot 3 \cdot 2$ Follow order of operations.
$= 24 + 16 + 12$
$= 52$

So, the surface area of the rectangular prism is 52 square meters.

Exercises

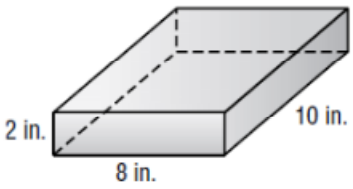
Find the surface area of each rectangular prism.

1.



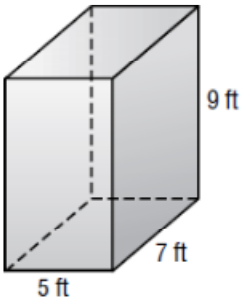
102 cm²

2.



232 in²

3.



286 ft²

Lesson 12–4