

Study Guide and Intervention

Surface Area of Rectangular Prisms

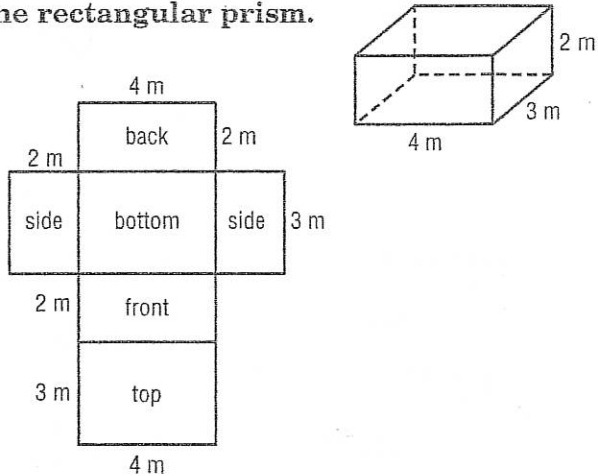
The sum of the areas of all the surfaces, or faces, of a three-dimensional figure is the **surface area**. The surface area S of a rectangular prism with length ℓ , width w , and height h is found using the following formula.

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

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	$24 + 16 + 12 = 52$

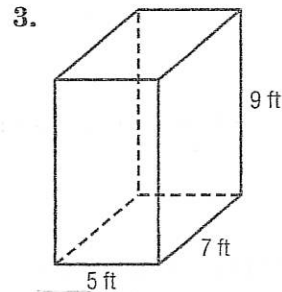
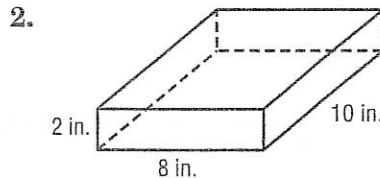
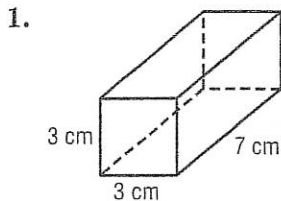
Alternatively, replace ℓ with 4, w with 3, and h with 2 in the formula for surface area.

$$\begin{aligned}
 S &= 2\ell w + 2\ell h + 2wh \\
 &= 2 \cdot 4 \cdot 3 + 2 \cdot 4 \cdot 2 + 2 \cdot 3 \cdot 2 && \text{Follow order of operations.} \\
 &= 24 + 16 + 12 \\
 &= 52
 \end{aligned}$$

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

EXAMPLE

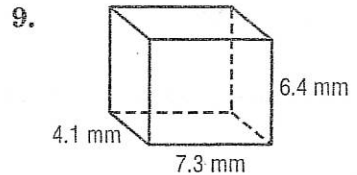
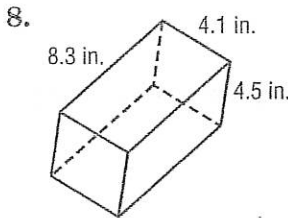
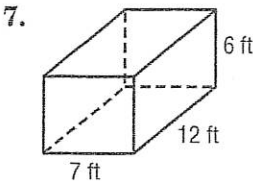
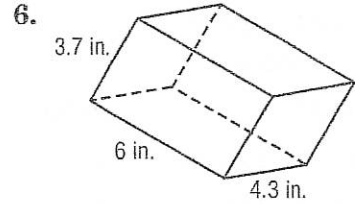
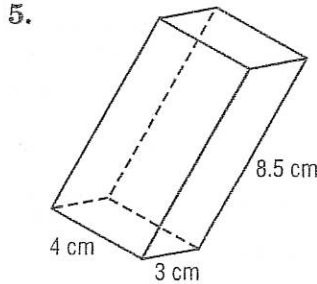
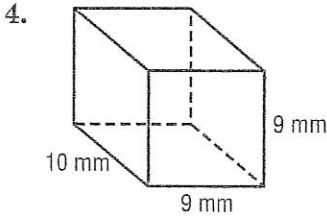
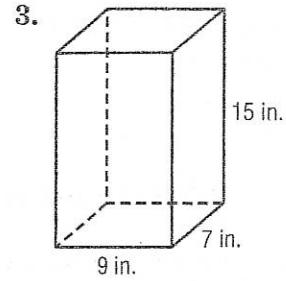
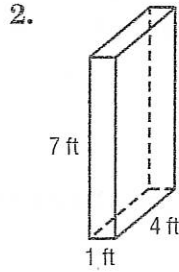
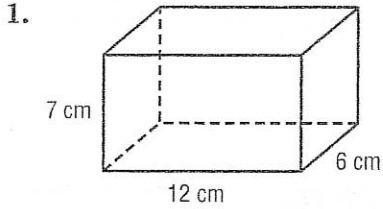
Find the surface area of each rectangular prism.



Practice: Skills

Surface Area of Rectangular Prisms

Find the surface area of each rectangular prism. Round to the nearest tenth if necessary.



10. A cube has a surface area of 126 square feet. What is the area of one face?

11. Find the surface area of a rectangular prism that has a length of 8 inches, a width of 3 inches, and a height of 6 inches.