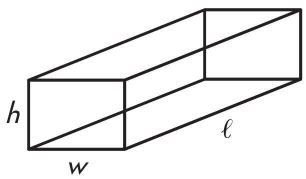
Lesson 6.6 Surface Area: Rectangular Solids

The **surface area** of a solid is the sum of the areas of all surfaces of the solid. A rectangular solid has 6 surfaces.

The area of each surface is determined by finding:



length × width, length × height, width × height

The total surface area is found using this formula:

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

If $\ell = 10$ m, $w = 6$ m, and $h = 4$ m, the surface area is found as follows:

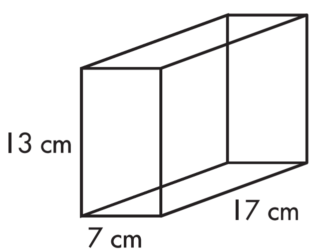
$SA = 2(10 \times 6) + 2(10 \times 4) + 2(6 \times 4)$

$SA = 2(60) + 2(40) + 2(24) = 120 + 80 + 48 = 248$ m^2

Find the surface area of each rectangular solid.

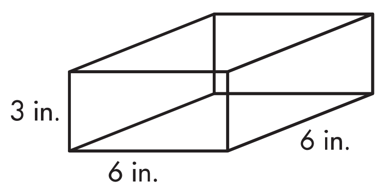
1.

a



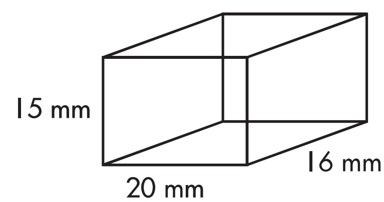
$SA =$ ________ cm^2

b



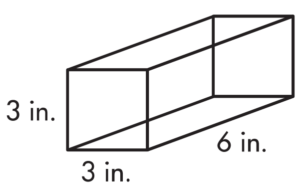
$SA =$ ________ in.^{2}

c

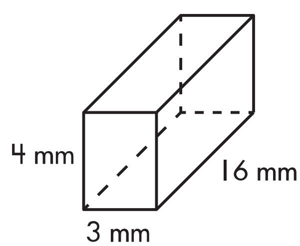


$SA =$ ________ mm^2

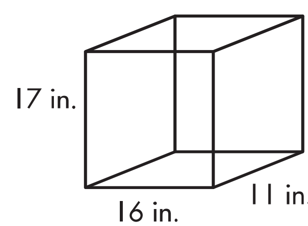
2.



$SA =$ ________ in.^{2}



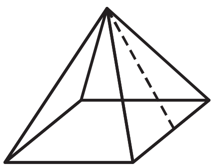
$SA =$ ________ ft.^{2}



$SA =$ ________ in.^{2}

Lesson 6.7 Surface Area: Pyramids

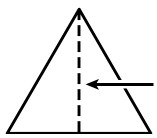
The **surface area** of a solid is the sum of the areas of all surfaces of the solid. The surface area of a square pyramid is the sum of the area of the square base and each of the 4 triangular sides.



side

Each triangle's area is $\frac{1}{2}$ base $\times$ height. In a pyramid, **base** refers to the side length and **height** refers to the slant height, or length. So surface area or $SA = (\text{side} \times \text{side}) + 4(\frac{1}{2}\ \text{side} \times \text{length})$.

$SA = s^2 + 2s\ell$ SA is given in **square units**, or **units²**.



slant height, or *length* (ℓ) of the side

If $s = 6$ cm and $\ell = 10$ cm, what is the surface area?

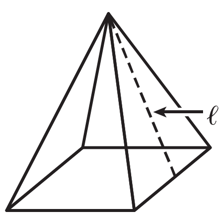
$SA = s^2 + 2s\ell$

$SA = 6^2 + 2 \times 6 \times 10 = 36 + 120 = 156\ \text{cm}^2$

Find the surface area of each square pyramid.

1.

a

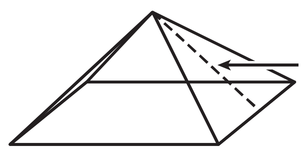


$\ell = 11$ in.

$s = 8$ in.

$SA =$ ________ in.²

b



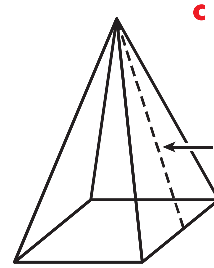
$\ell = 10.5$ cm

$s = 15$ cm

$SA =$ ________ cm²

c

ℓ

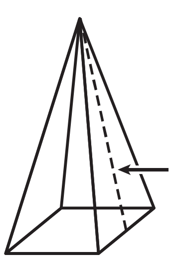


$\ell = 12$ m

$s = 7$ m

$SA =$ ________ m²

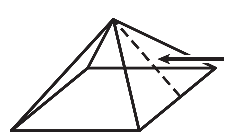
2.



$\ell = 21$ ft.

$s = 9$ ft.

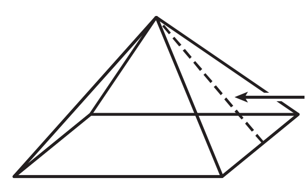
$SA =$ ________ ft.²



$\ell = 8$ cm

$s = 10$ cm

$SA =$ ________ cm²



$\ell = 17.5$ in.

$s = 22$ in.

$SA =$ ________ in.²