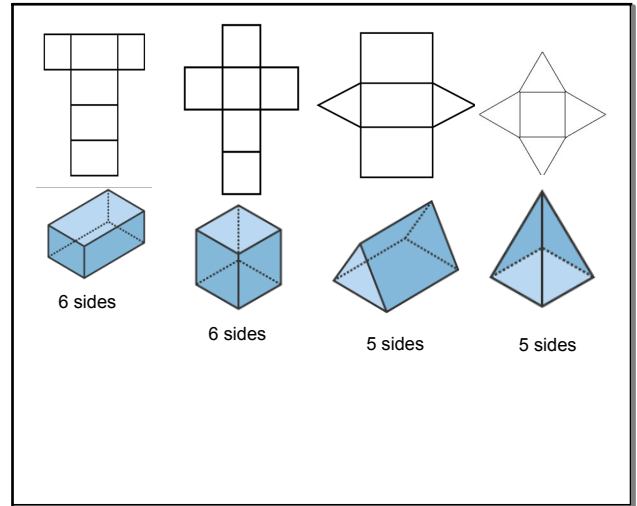


### 10.9 Surface Area

The **surface area** of a three-dimensional figure is the sum of the areas of its surfaces.

To help you see all the surfaces of a three-dimensional figure, you can use a *net*.

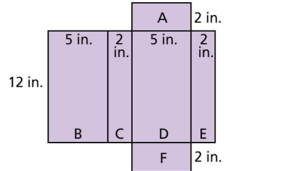
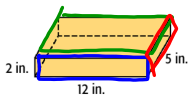
A **net** is the pattern made when the surface of a three-dimensional figure is layed out flat showing each face of the figure.



May 27-3:17 PM

May 31-9:15 AM

#### Method 1: Use a net.

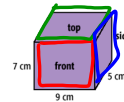


$in^2$

**A:**  $A = 5 \times 2 = 10$   
**B:**  $B = 12 \times 5 = 60$   
**C:**  $C = 12 \times 2 = 24$   
**D:**  $D = 12 \times 5 = 60$   
**E:**  $E = 12 \times 2 = 24$   
**F:**  $F = 5 \times 2 = 10$   
 Add the areas of each face.  
 $S = 10 + 60 + 24 + 60 + 24 + 10 = 188$   
 The surface area is  $188 in^2$ .

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#### Method 2: Use a three-dimensional drawing.



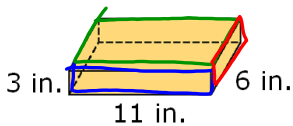
**Front:**  $9 \times 7 = 63 \rightarrow 63 \times 2 = 126$   
**Top:**  $9 \times 5 = 45 \rightarrow 45 \times 2 = 90$   
**Side:**  $7 \times 5 = 35 \rightarrow 35 \times 2 = 70$

$S = 126 + 90 + 70 = 286$  Add the areas of each face.

The surface area is  $286 cm^2$ .

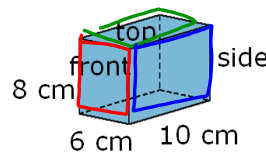
$286$

May 31-9:11 AM



Front:  $11 \cdot 3 = 33 \times 2 = 66$   
 Top:  $11 \cdot 6 = 66 \times 2 = 132$   
 Side:  $6 \cdot 3 = 18 \times 2 = 36$   
 Surface Area: Total of all areas =  $234 in^2$

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Front:  $8 \cdot 6 = 48 \times 2 = 96$   
 Top:  $10 \cdot 6 = 60 \times 2 = 120$   
 Side:  $8 \cdot 10 = 80 \times 2 = 160$   
 Surface Area: Total of all areas =  $376 cm^2$

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Base:  $7 \cdot 7 = 49$

Side:  $7 \cdot 8 \div 2 = 28$  x 4 = 112

Surface Area: Total of all areas =  $161 \text{ ft}^2$

May 31-9:12 AM

Base:  $6 \cdot 6 = 36$

Side:  $6 \cdot 5 \div 2 = 15$  x 4 = 60

Surface Area: Total of all areas =  $96 \text{ ft}^2$

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Base:  $4 \cdot 3 \div 2 = 6$  x 2 = 12

Side:  $4 \cdot 8 = 32$  x 3 = 96

Surface Area: Total of all areas =  $108 \text{ cm}^2$

May 31-9:26 AM

Find the surface area of the cylinder formed by the net to the nearest tenth. Use 3.14 for  $\pi$ .

$C = \pi d$   
 $S = 2\pi r^2 + 2\pi rh$  Use the formula.  
 Rectangle:  $3.14 \cdot 12 \cdot 8.3 = 312.744$

Circle:  $3.14 \cdot 3^2 = 28.26$  x 2 = 56.52

Surface Area: Total of all areas =  $369.264$

$A = \pi r^2$

May 22-10:46 AM

Find the surface area of the cylinder formed by the net to the nearest tenth. Use 3.14 for  $\pi$ .

$C = \pi d$   
 $S = 2\pi r^2 + 2\pi rh$  Use the formula.  
 Rectangle:  $3.14 \cdot 18 \cdot 20 = 1130.4$

Circle:  $3.14 \cdot 9^2 = 254.34$  x 2 = 508.68

Surface Area: Total of all areas =  $1639.08$

$\text{ft}^2$

May 22-10:46 AM

**Lesson Quiz**

Find the surface area of each figure to the nearest tenth.

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3. A drum is cylindrical, and its 14 in. width fits into a drum stand. What percent of the total surface area of the drum is covered by the 3 in. red stripe? Use 3.14 for  $\pi$ .

May 22-10:46 AM