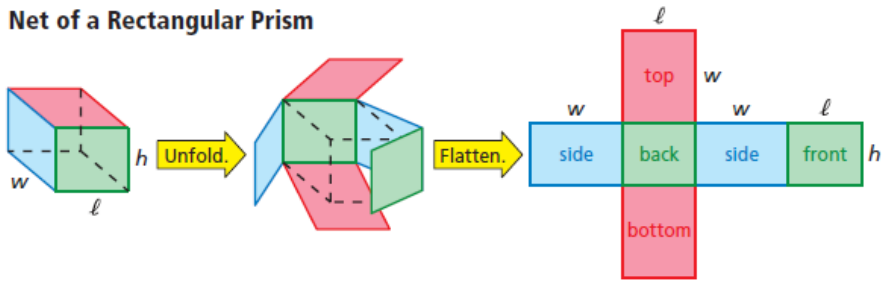
Indicator 32 Class Notes by Mrs. Joshi

Using Nets to Find Surface Area-(6.G.4)

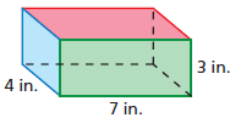
The **surface area** S of a three-dimensional figure is the sum of the areas of its faces. Surface area is measured in **square units**. You can find the surface area of a three-dimensional figure by using a two-dimensional representation of the figure called a **net**.

Key Idea

Net of a Rectangular Prism



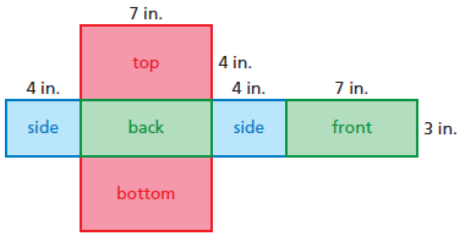
EXAMPLE 2 Finding the Surface Area of a Rectangular Prism



Find the surface area of the rectangular prism.

Use a net to find the area of each face.

Top: $7 \cdot 4 = 28$
Bottom: $7 \cdot 4 = 28$
Front: $7 \cdot 3 = 21$
Back: $7 \cdot 3 = 21$
Side: $4 \cdot 3 = 12$
Side: $4 \cdot 3 = 12$



Find the sum of the areas of the faces.

$$\text{Surface area} = \text{Area of top} + \text{Area of bottom} + \text{Area of front} + \text{Area of back} + \text{Area of a side} + \text{Area of a side}$$

$$S = 28 + 28 + 21 + 21 + 12 + 12$$

$$= 122$$

∴ The surface area is 122 square inches.

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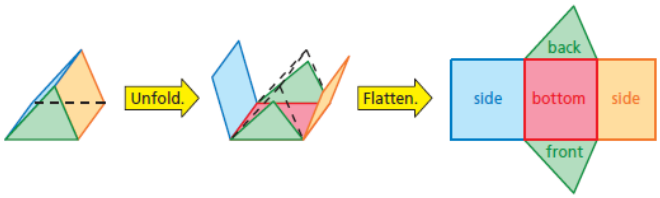
Key Idea

Net of a Triangular Prism

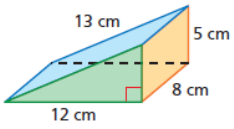
A **triangular prism** is a three-dimensional figure that has two triangular faces and three rectangular faces.



Remember

The area A of a triangle with base b and height h is $A = \frac{1}{2}bh$.

EXAMPLE 3 Finding the Surface Area of a Triangular Prism



Find the surface area of the triangular prism.

Use a net to find the area of each face.

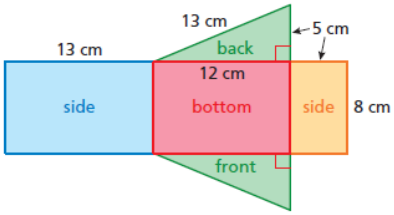
Bottom: $12 \cdot 8 = 96$

Front: $\frac{1}{2} \cdot 12 \cdot 5 = 30$

Back: $\frac{1}{2} \cdot 12 \cdot 5 = 30$

Side: $13 \cdot 8 = 104$

Side: $8 \cdot 5 = 40$



Find the sum of the areas of the faces.

$$\text{Surface area} = \text{Area of bottom} + \text{Area of front} + \text{Area of back} + \text{Area of a side} + \text{Area of a side}$$

$$S = 96 + 30 + 30 + 104 + 40$$

$$= 300$$

∴ The surface area is 300 square centimeters.

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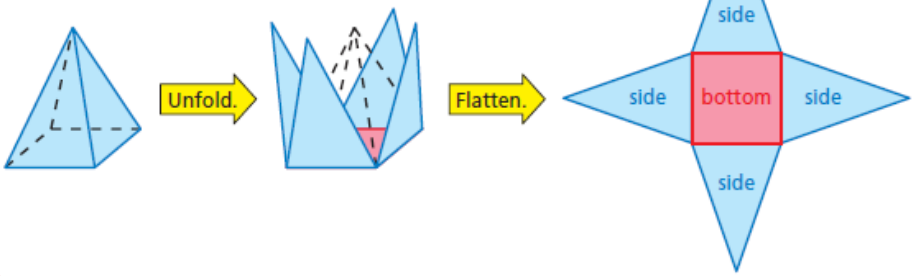
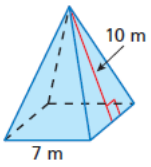
Key Idea

Net of a Square Pyramid

A **square pyramid** is a three-dimensional figure that has one square face and four identical triangular faces.



EXAMPLE 4 Finding the Surface Area of a Square Pyramid



Find the surface area of the square pyramid.

Use a net to find the area of each face.

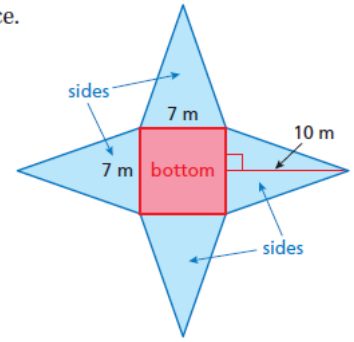
Bottom: $7 \cdot 7 = 49$

Side: $\frac{1}{2} \cdot 7 \cdot 10 = 35$

Side: $\frac{1}{2} \cdot 7 \cdot 10 = 35$

Side: $\frac{1}{2} \cdot 7 \cdot 10 = 35$

Side: $\frac{1}{2} \cdot 7 \cdot 10 = 35$



Find the sum of the areas of the faces.

$$\text{Surface area} = \text{Area of bottom} + \text{Area of a side} + \text{Area of a side} + \text{Area of a side} + \text{Area of a side}$$

$$S = 49 + 35 + 35 + 35 + 35$$

$$= 189$$

∴ The surface area is 189 square meters.