



Use previous knowledge of surface area to make connections to the formulas for lateral and total surface area and determine solutions for problems involving rectangular prisms and triangular prisms

Essential Question:

Questions:

Notes:



Surface Area of a solid figure is the sum of the areas of its surface.

→ Express units as square units since we are finding a type of area.

→ How much material needed to create figure; how much paper needed to wrap solid

A net is a pattern made when the surface of a 3-dimensional figure is laid out flat.

→ Nets show each face of the figure

→ Nets are a 2-dimensional representation of the solid that shows all the faces at once

Find the total surface area of the rectangular prism using its net:

40
 40
 180
 180
 72
 $+ 72$
 $\hline 584$

584 in²

Find the total surface area of the rectangular prism:

$B: 5 \cdot 3 = 15 \text{ cm}^2 \text{ each}$
 $F: 10 \cdot 5 = 50 \text{ cm}^2 \text{ each}$
 $10 \cdot 3 = 30 \text{ cm}^2 \text{ each}$
 $2(15 + 50 + 30) = 190 \text{ cm}^2$

The formula for finding the Total Surface Area of a prism is $S = Ph + 2B$

S is Total surface area P is Perimeter of base h is height of figure B is Area of base



Find the total surface area of the rectangular prism below: $S = Ph + 2B$



$$P = 10 + 4 + 10 + 4 = 28 \text{ cm}$$

$$h = 3 \text{ cm}$$

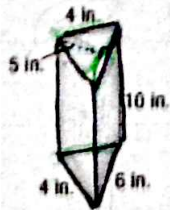
$$B = 10 \cdot 4 = 40 \text{ cm}^2$$

$$S = (28)(3) + 2(40)$$

$$S = 84 + 80$$

$$S = 164 \text{ cm}^2$$

Find the total surface area of the triangular prism below: $S = Ph + 2B$



$$P = 4 + 4 + 6 = 14 \text{ in}$$

$$h = 5 \text{ in}$$

$$B = \frac{1}{2} \cdot 6 \cdot 5 = 15 \text{ in}^2$$

$$S = (14)(10) + 2(15)$$

$$S = 140 + 30$$

$$S = 170 \text{ in}^2$$

There are two types of surface area.

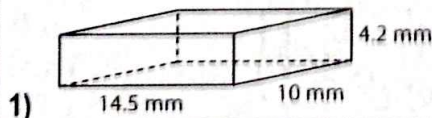
→ **Total Surface Area:** Area of all the surfaces on a 3D solid, including bases

$$S = Ph + 2B$$

→ **Lateral Surface Area:** Area of the faces on a 3D solid. **Does not include bases!**

$$S = Ph ; S \text{ is lateral surface area; } P \text{ is Perimeter of base; } h \text{ is height of figure}$$

Find the lateral surface area and total surface area for each prism below:



$$P = 14.5 + 10 + 14.5 + 10 = 49 \text{ mm}$$

$$h = 4.2 \text{ mm}$$

$$B = 14.5 \cdot 10 = 145 \text{ mm}^2$$

Lateral surface area: $S = Ph$

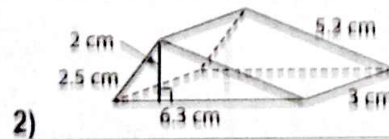
$$S = (49)(4.2)$$

$$S = 205.8 \text{ mm}^2$$

Total surface area: $S = Ph + 2B$

$$S = (49)(4.2) + 2(145)$$

$$S = 205.8 + 290 = 495.8 \text{ mm}^2$$



$$P = 2.5 + 6.3 + 5.2 = 14 \text{ cm}$$

$$h = 3 \text{ cm}$$

$$B = \frac{1}{2} \cdot 6.3 \cdot 3 = 9.45 \text{ cm}^2$$

Lateral surface area: $S = Ph$

$$S = (14)(3)$$

$$S = 42 \text{ cm}^2$$

Total surface area: $S = Ph + 2B$

$$S = (14)(3) + 2(9.45)$$

$$S = 42 + 18.9 = 60.9 \text{ cm}^2$$

Summary: