6-2 Surface Area of 3D Shapes

- I can find the surface area of three dimensional figures using nets made of rectangles and triangles.

Vocabulary

Surface area : is how much area is on the *outside* of a solid.

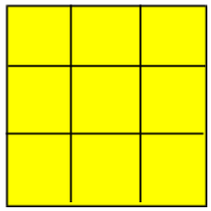
- We measure surface area with square units.

in^2 ft^2 mi^2 mm^2 cm^2 m^2 km^2 $units^2$

What We Know:

Area: is the amount of space inside a flat surface, which is measured with square units.

Square



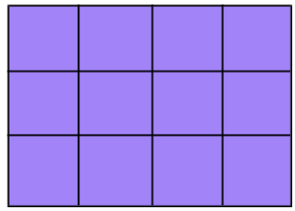
3 units

Area = s^2

3^2

= 9 square units

Rectangle



3 units

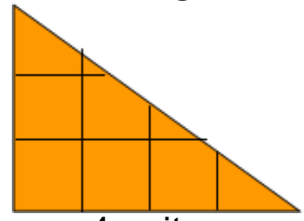
4 units

Area = l × w

3 × 4

= 12 square units

Triangle



3 units

4 units

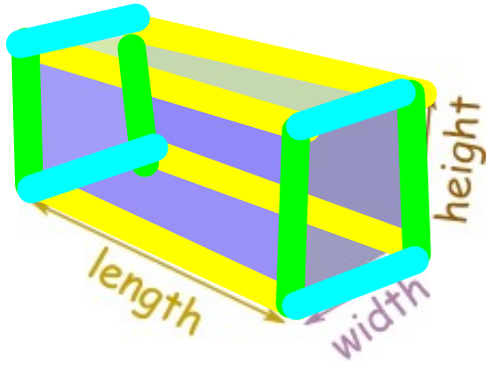
Area = ½ bh

$\frac{1}{2} \cdot 4 \cdot 3$

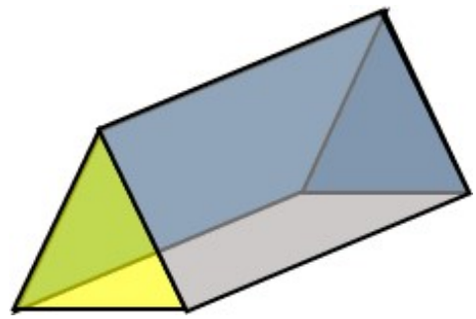
= 6 square units

What We Know:

Surface - On a prism, surfaces refer to the flat **faces** that make up the solid.

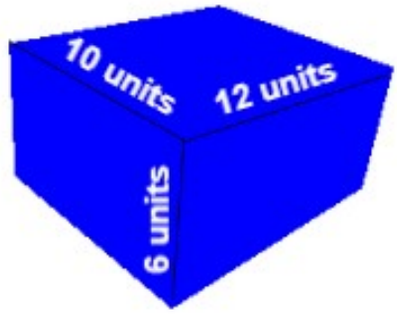


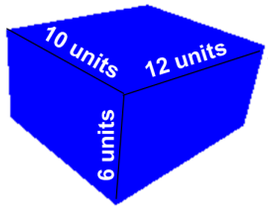
Rectangular prisms have 6 faces. All faces are rectangles.



Triangular prisms have 5 faces. 2 are triangles, & 3 are rectangles.

How do we find the surface area of a rectangular prism?





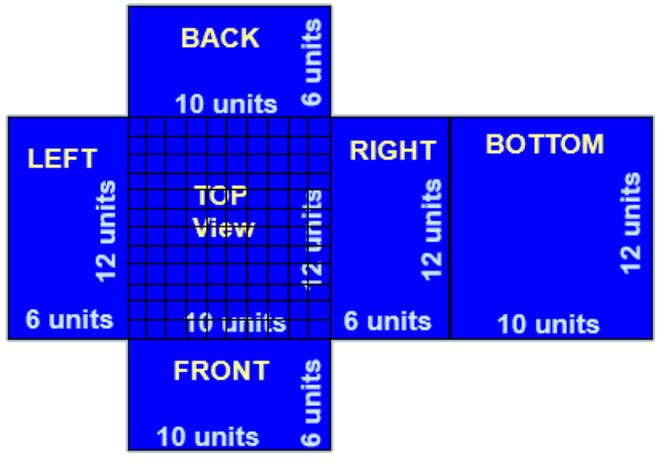
We can find the area of the prism.

Top = $10 \cdot 12 = 120$ u²
Bottom = 120 u²

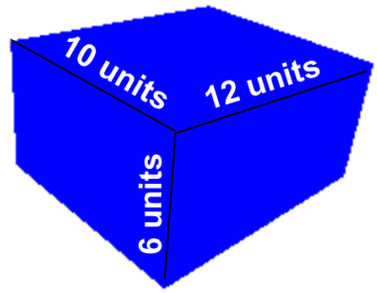
Front = $10 \cdot 6 = 60$ u²
Back = 60 u²

Left Side = $12 \cdot 6 = 72$ u²
Right Side = 72 u²

total 504 u²



To find the surface area of a rectangular prism, you are finding the area of each of the 6 rectangular surfaces and adding them up to get a total.



Top = 120 u^2
Bottom = 120 u^2

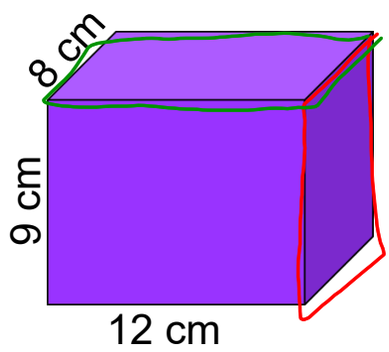
Front = 60 u^2
Back = 60 u^2

Left Side = 72 u^2
Right Side = 72 u^2

504 u^2

surface area

Find the surface area of this rectangular prism.



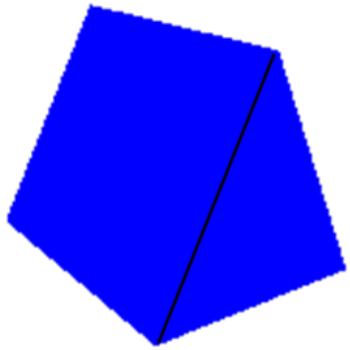
Front = 9 cm × 12 cm = 108 cm^2
Back = (Front) = 108 cm^2 (same)

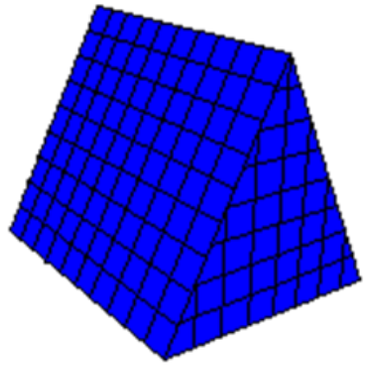
Left Side = 9 cm × 8 cm = 72 cm^2
Right Side = (Left Side) = 72 cm^2 (same)

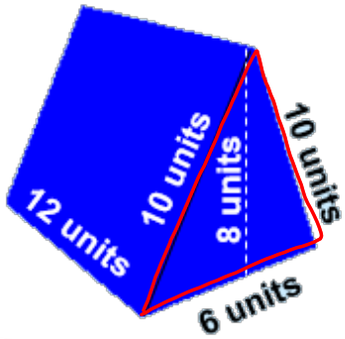
Top = 8 cm × 12 cm = 96 cm^2
Bottom = (Top) = 96 cm^2 (same)

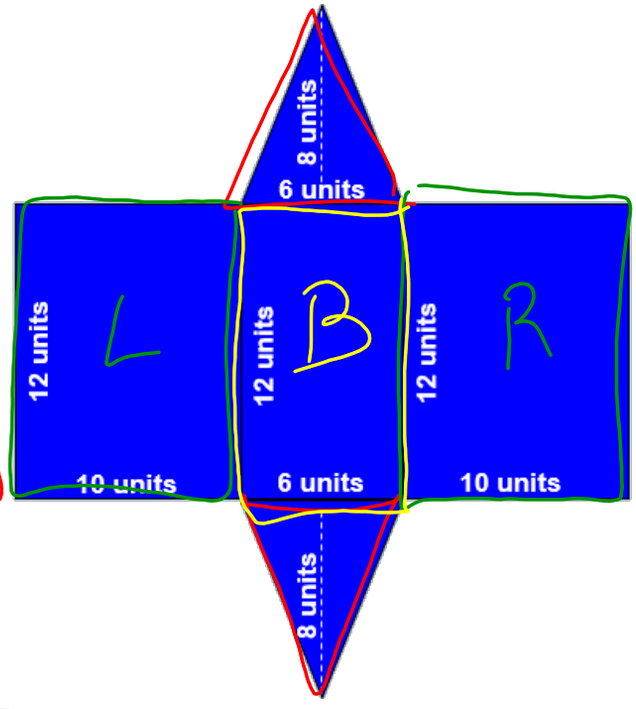
Surface Area = 552 cm^2

How do you think we find the surface area of a triangular prism?









Front: $\frac{6 \cdot 8}{2} = \frac{48}{2} = 24$

Back: 24

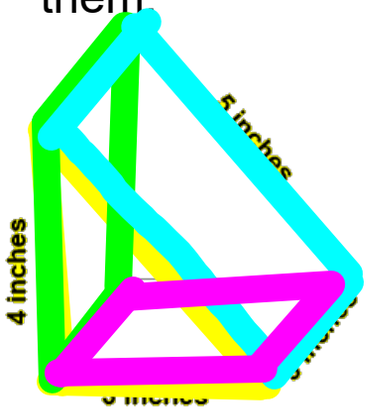
Left Side: $10 \cdot 12 = 120$

Right Side: 120

Bottom: $6 \cdot 12 = 72$

Total Area: 360 units^2

What are the shapes and measurements for each of the faces of this triangular prism? List them



$\frac{3 \times 4}{2} = \frac{12}{2} = 6$

6

Left Side: $4 \cdot 3 = 12$

Right Side: $3 \cdot 5 = 15$

Bottom: $3 \cdot 3 = +9$

Total Area: 48 in^2