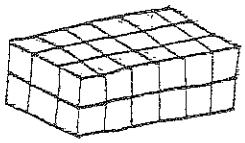
Calculating Surface Area of Rectangular Prisms

Recall that area is the number of square units needed to cover a surface.

eg)  $A = 18 \text{ units}^2$

Surface area is the number of square units needed to cover a 3-dimensional object. In other words, it is the sum of the areas of all the faces (flat surfaces) of a 3-D object.

eg) 

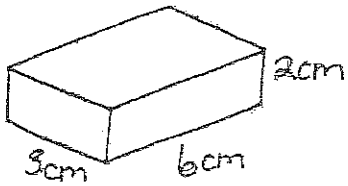
$A = 36 \times 2$
$= 72 \text{ units}^2$

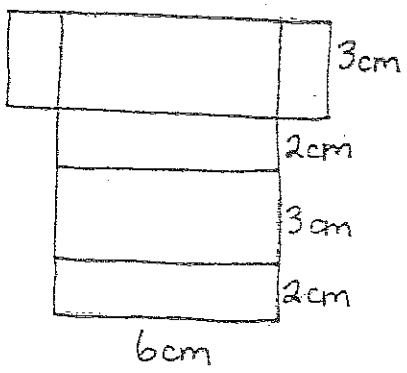
There are 3 main steps involved in finding surface area. They are:

① Draw the net of the 3-D object.

- You can draw a net for an object by visualizing what it would look like if you cut along the edges and flattened it out.

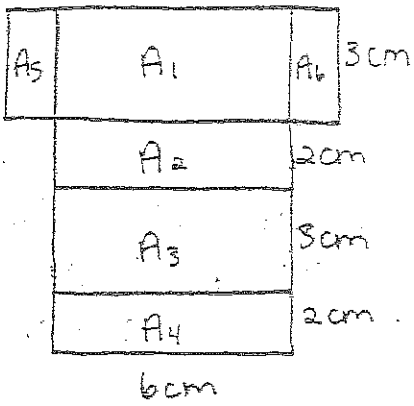
eg)





* There is more than 1 way to draw the nets of prisms, you just have to be careful of your measurements and where you place them.

② Calculate the area for each face.



Area of a rectangle = $l \times w$

$A_1 = 6cm \times 3cm$
$= \boxed{18cm^2}$

$A_3 = 6cm \times 3cm$
$= \boxed{18cm^2}$

$A_2 = 2cm \times 6cm$
$= \boxed{12cm^2}$

$A_4 = 2cm \times 6cm$
$= \boxed{12cm^2}$

$A_5 = 2cm \times 3cm$
$= \boxed{6cm^2}$

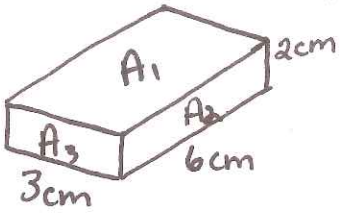
$A_6 = 2cm \times 3cm$
$= \boxed{6cm^2}$

③ Add all of the areas together.

$$\text{Surface area} = A_1 + A_2 + A_3 + A_4 + A_5 + A_6$$
$$= 18 + 12 + 18 + 12 + 6 + 6$$
$$= 72cm^2$$

So $72cm^2$ is the total surface area of the rectangular prism.

Alternative Method



You may have noticed that in a rectangular prism the top and bottom are congruent (identical), front and back are congruent and the 2 side faces are congruent. Using this info, we can simplify how we calculate the surface area for it.

I like to label the 3 different surfaces A_1, A_2, and A_3 (this also does not require you to draw a net). Next, calculate the area for each surface, multiply it by 2 and then add them together.

$A_1 = lw$
$= 3(6)$
$= 18\text{cm}^2$
$\times 2$
36cm^2

$+$

$A_2 = lw$
$= 6(2)$
$= 12\text{cm}^2$
$\times 2$
24cm^2

$+$

$A_3 = lw$
$= 3(2)$
$= 6\text{cm}^2$
$\times 2$
12cm^2

$= \boxed{72\text{cm}^2}$

Add together to get total surface area

Alternatively, you could also add $18\text{cm}^2 + 12\text{cm}^2 + 6\text{cm}^2 = 36\text{cm}^2$ which is the total for the 3 surfaces, then multiply it by 2.

$$36\text{cm}^2 \times 2 = \boxed{72\text{cm}^2}$$

All 3 ways work, you just need to figure out which way works best for your brain and use it! If not sure, try all 3 and decide. The key is to keep your work well organized. Good luck!