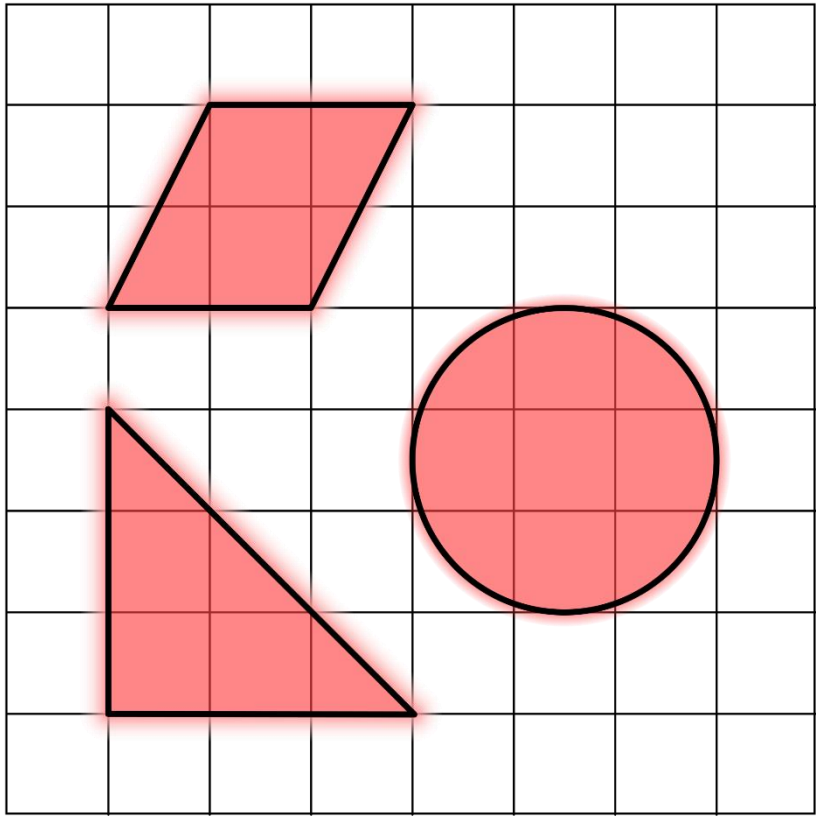
If you know how to find the area of 2D shapes, then this will be easy!

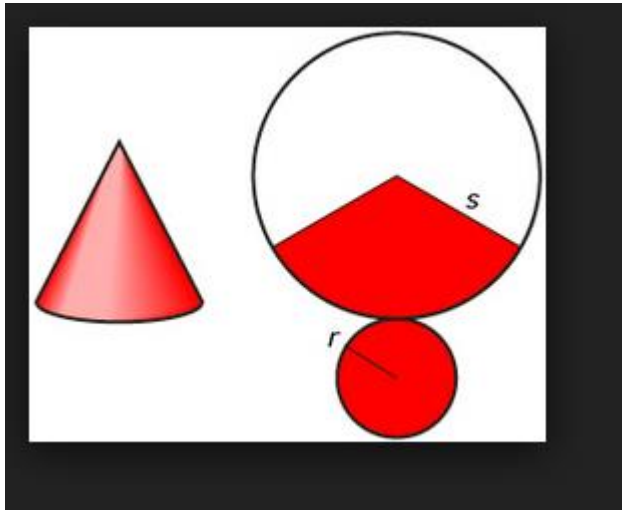
Polygons and Circle	Area Formula
Triangle	$A = \frac{1}{2} \cdot b \cdot h$
Rectangle	$A = l \cdot w$
Square	$A = s^2$
Parallelogram	$A = b \cdot h$
Trapezoid	$A = \frac{1}{2} \cdot h(b_1 + b_2)$
Regular Polygon	$A = \frac{1}{2} \cdot a \cdot P$
Circle	$A = \pi \cdot r^2$

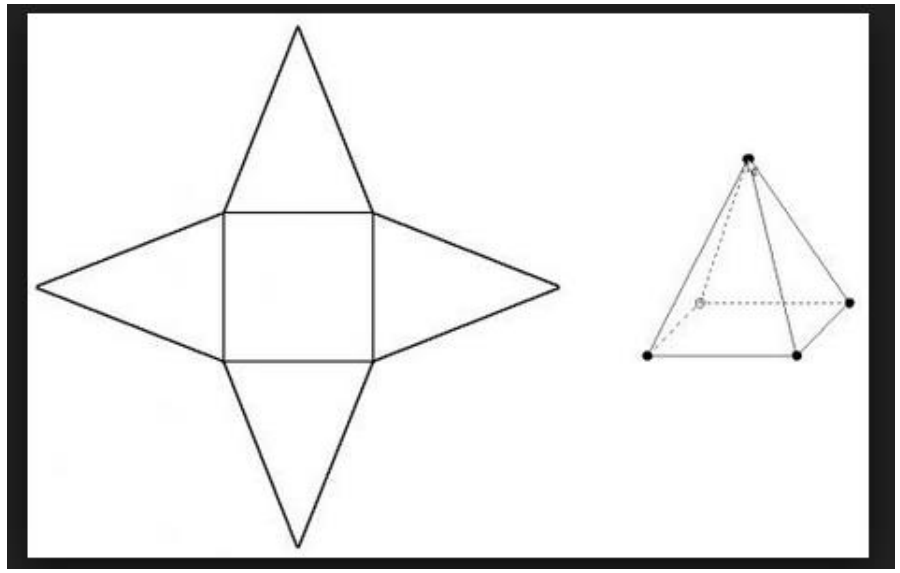


What is Surface Area?

The sum of all the **areas** of all the shapes that cover the **surface** of the object.

Think: 3D shapes but adding all the flat 2D shapes.





Examples:

How much paint to use to cover a room…

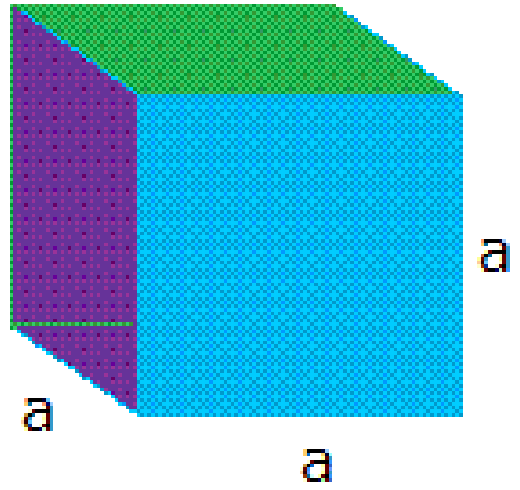
How much material to use for a package or a box…

How much construction material for a 3D structure…

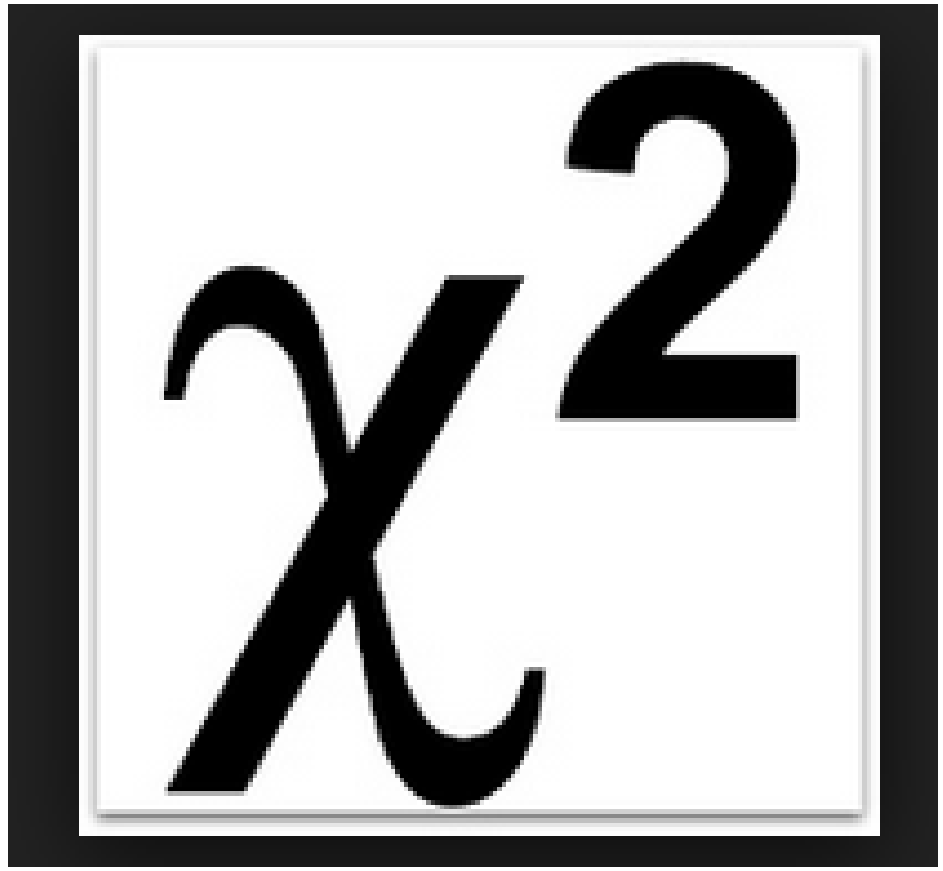
Class One

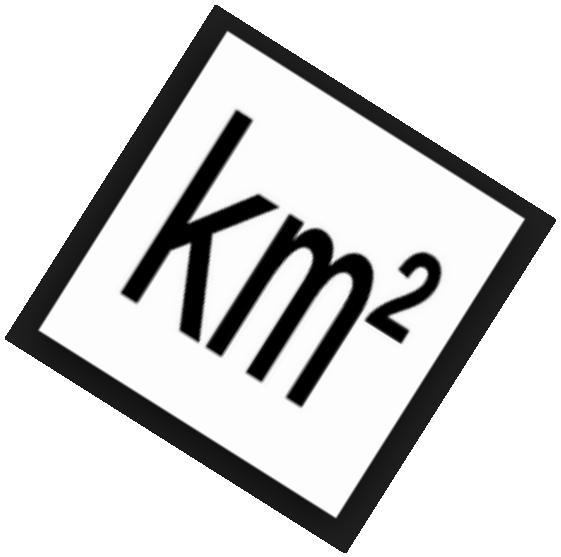
Surface Area

Cube

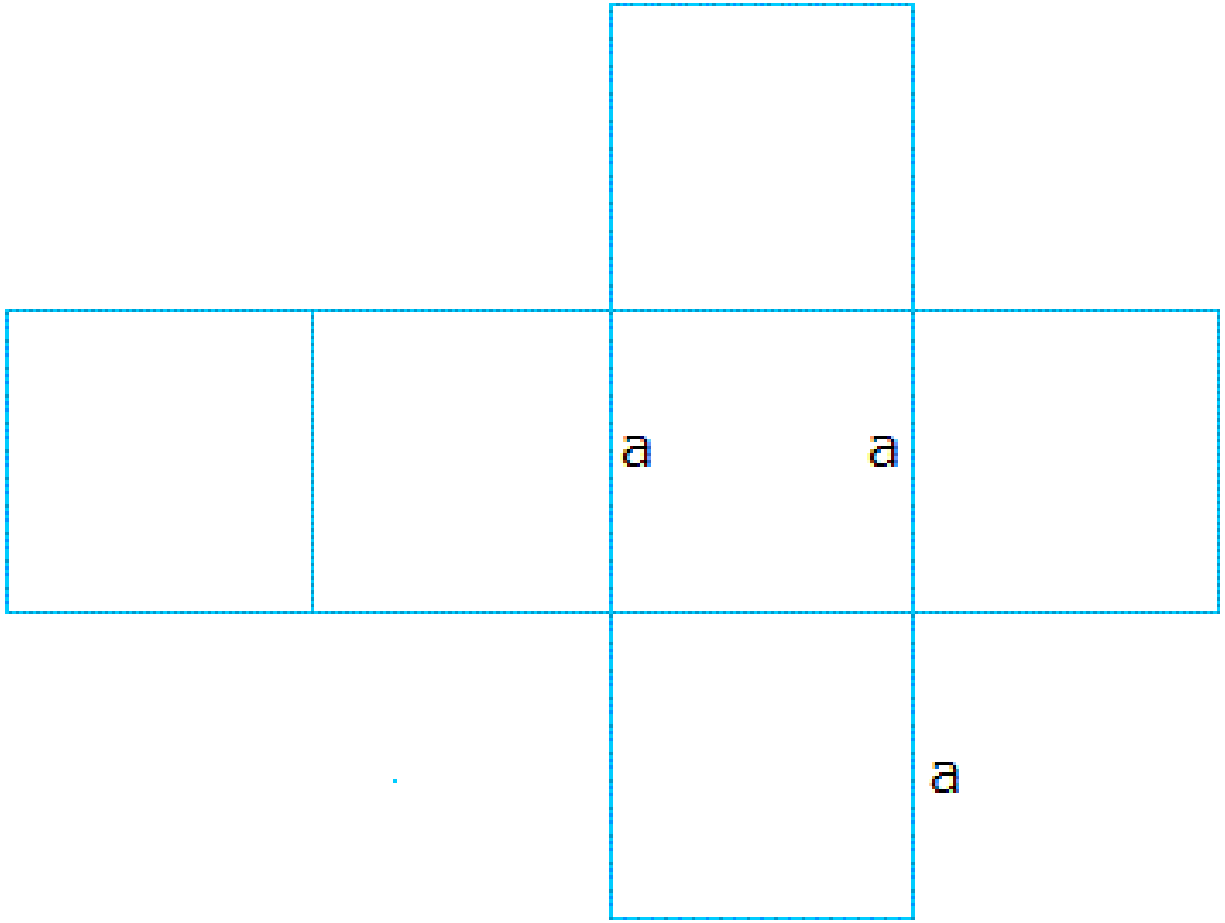


The unit in your answer must be squared because we want to know how many flat squares it takes to cover the shape.





Flat Cube: Net



Looking at the cube template, it is easy to see that the cube has six sides and each side is a square

The area of one square is $a \times a = a^2$

Since there are six sides, the total surface area, call it SA is:

$SA = a^2 + a^2 + a^2 + a^2 + a^2 + a^2$

$SA = 6 \times a^2$

Find the surface area if the length of one side is 1/2 cm

Surface area = $6 \times a^2$

Surface area = $6 \times (1/2)^2$

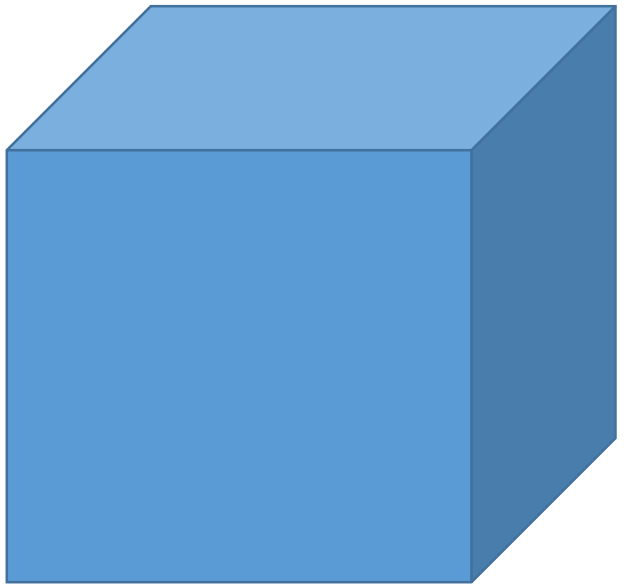
Surface area = $6 \times 1/2 \times 1/2$

Surface area = $6 \times 1/4$

Surface area = $6/4$ cm^2

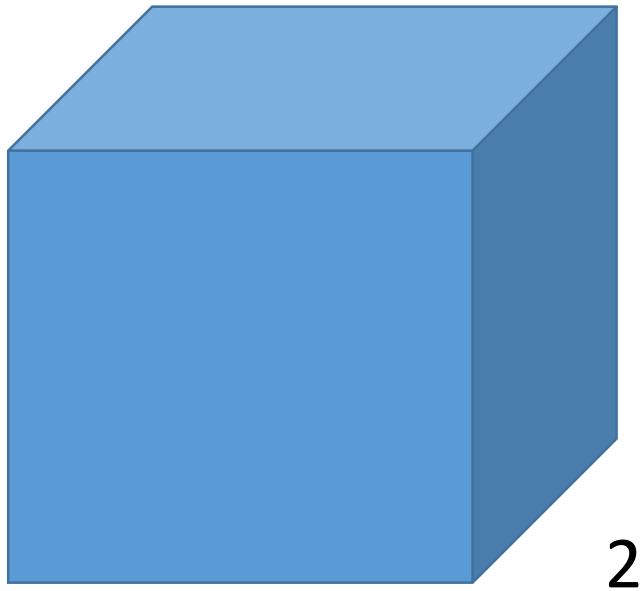
Surface area = $3/2$ cm^2

Surface area = 1.5 cm^2



½ cm

You practice with your teacher…



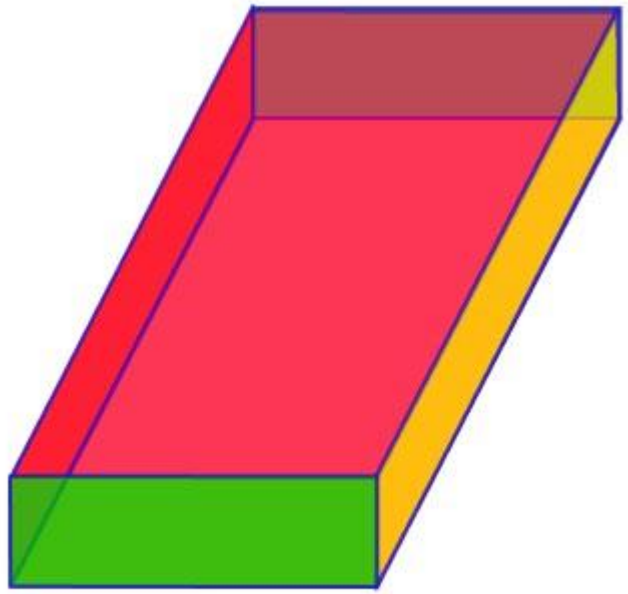
2/5 cm

Surface Area of a cube = $6a^2$

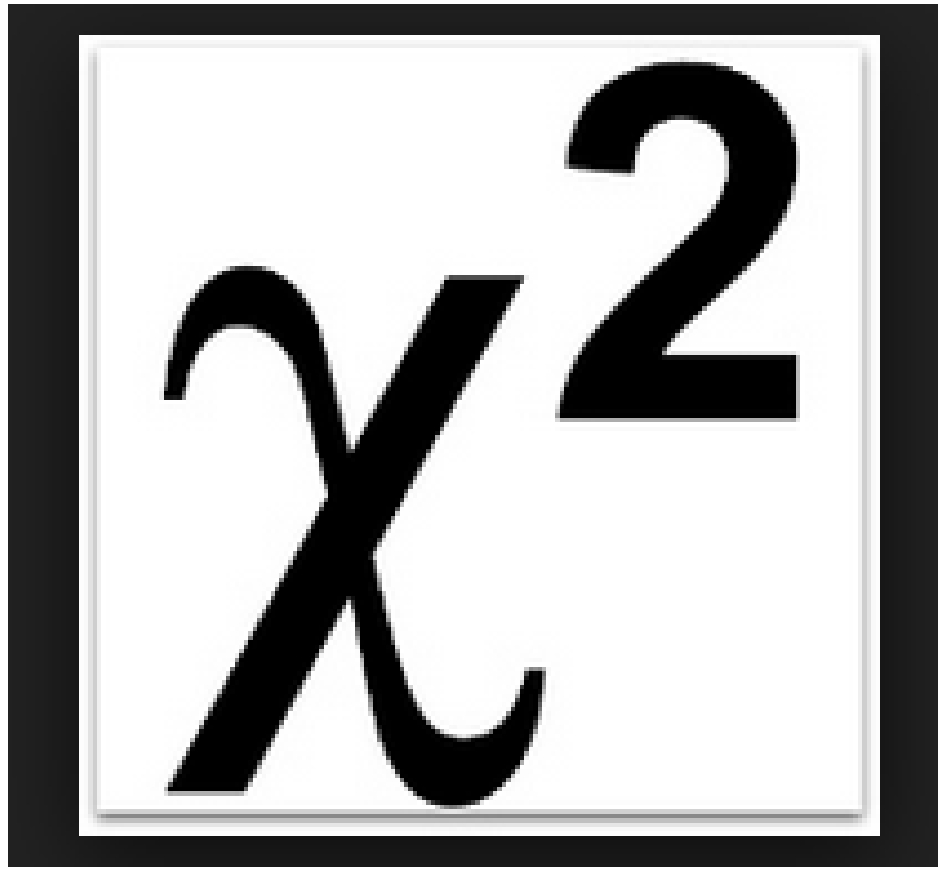
Class Two

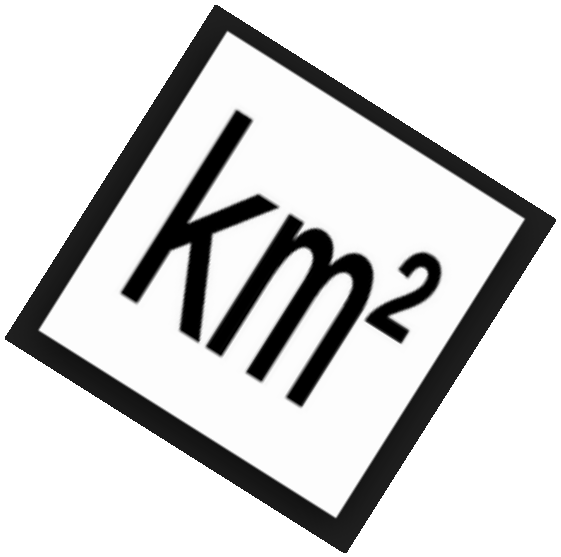
Surface Area

Rectangular Prism

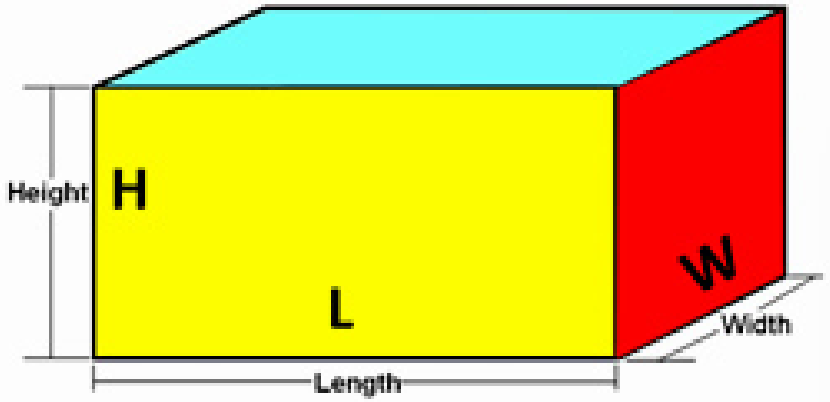


The unit in your answer must be squared because we want to know how many flat squares it takes to cover the shape.



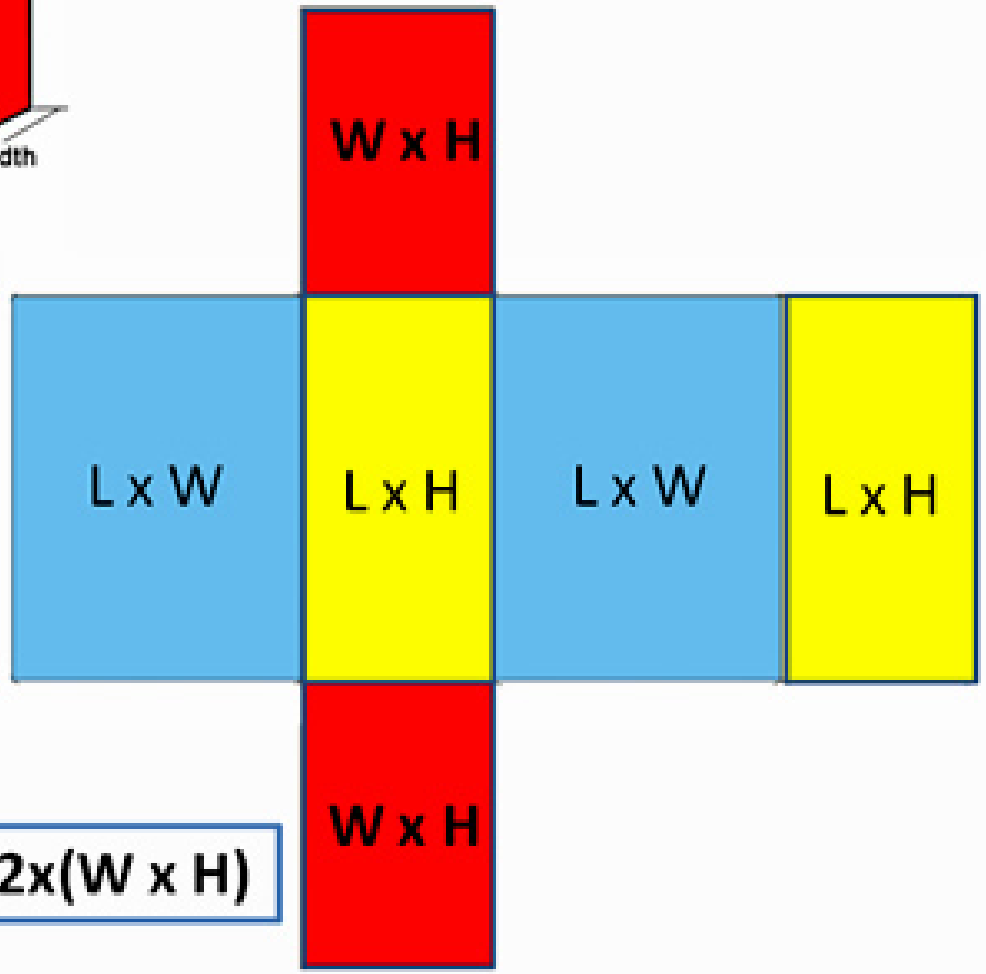


- Surface area of a rectangualr prism is basically:
- The area of the six rectangles that cover it all added together.
- BUT we can do it even easier!



The "Total Surface Area" =

2 x (L x W) : Two Blues
+ 2 x (L x H) : Two Yellows
+ 2 x (W x H) : Two Reds



TSA = 2 x(L x W) + 2x(L x H) + 2x(W x H)

- Find the area of each rectangle

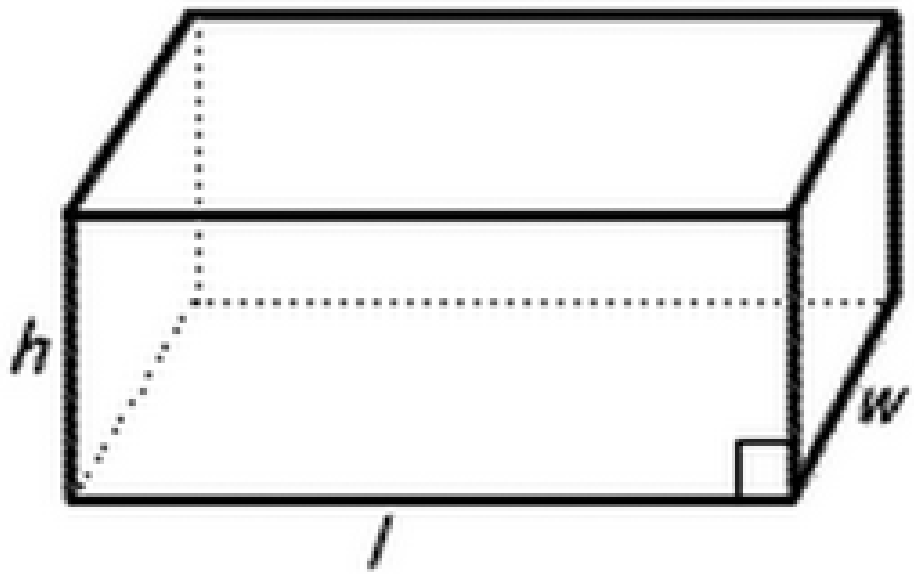
w*h l*w l*h

- Add them +
- Then multiply by 2

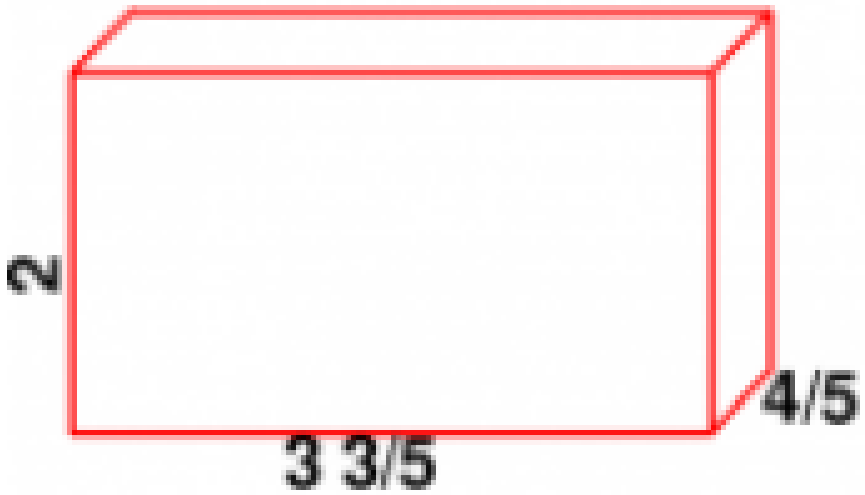
Rectangular Prism

Surface Area

$A = 2(wh + lw + lh)$



$$SA = 2(wh + lw + lh)$$



Width=

Height=

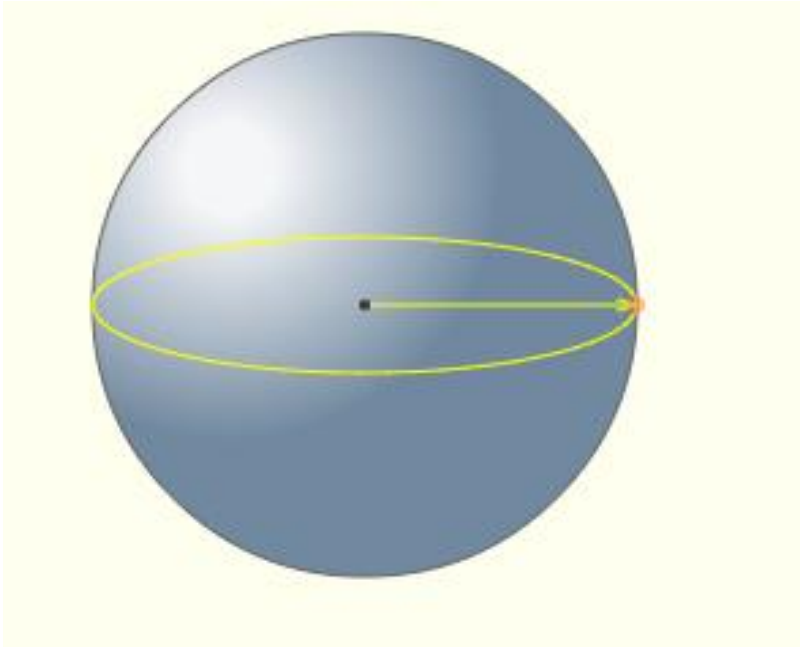
Length=

You practice with your teacher…

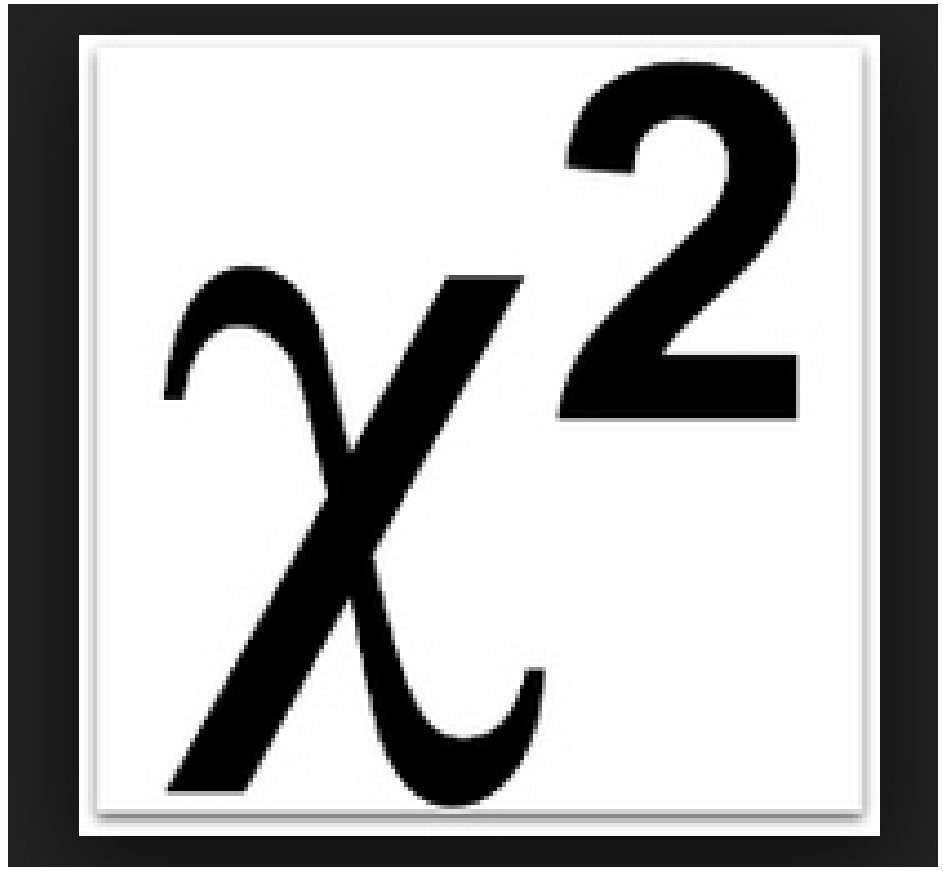
Class Three

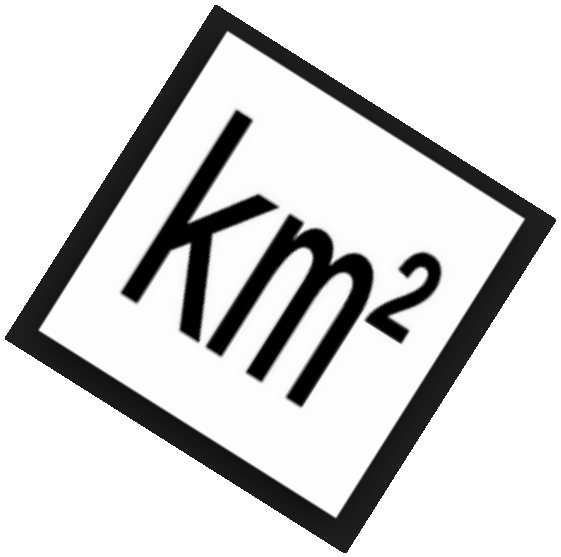
Surface Area

Sphere

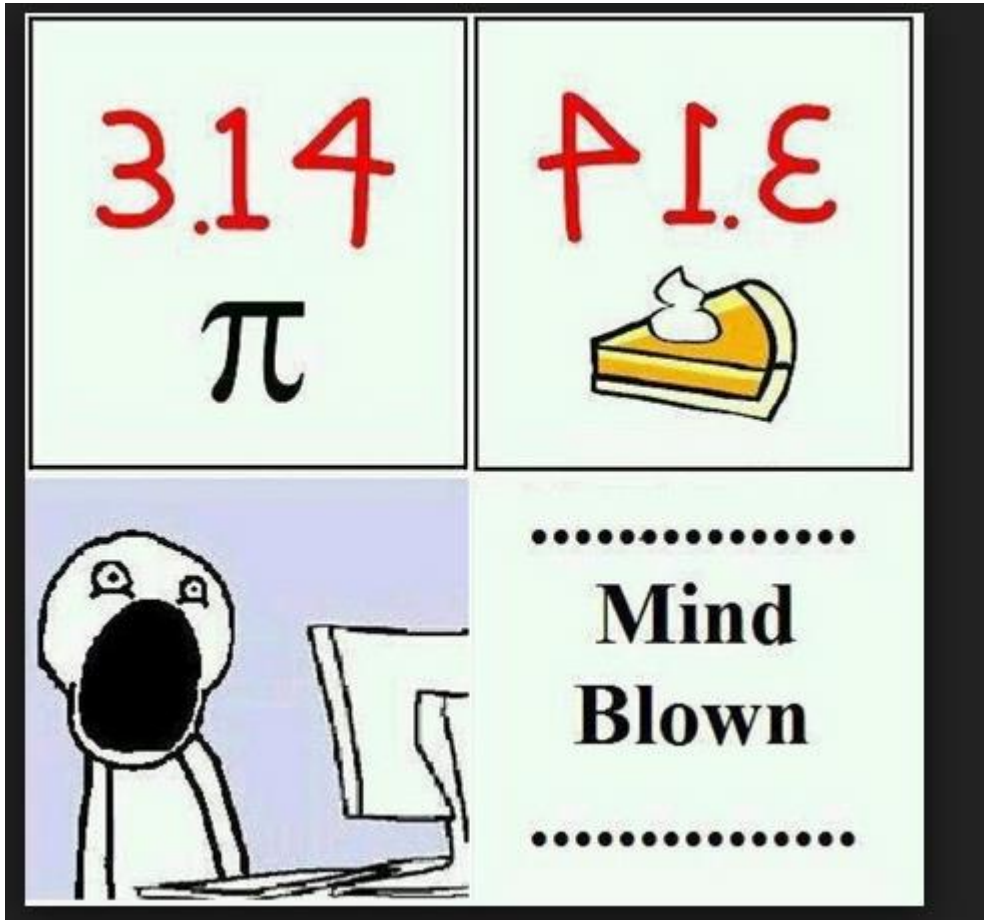


The unit in your answer must be squared because we want to know how many flat squares it takes to cover the shape.





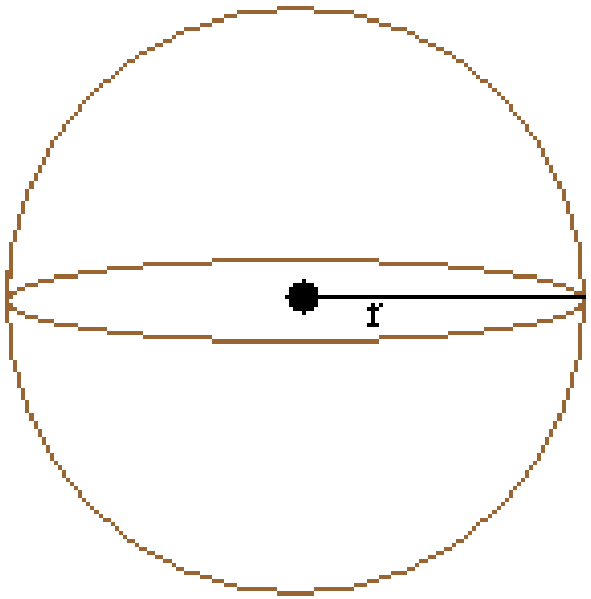
Remember pi…



You will use the fractional form of pi...

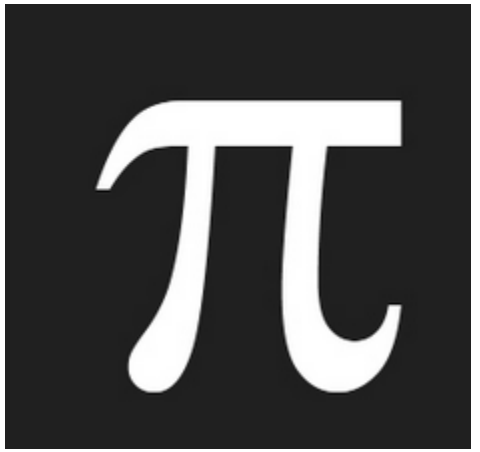
It is not exact, but you will be working with fractions, so it will be easier for you!

Sphere:



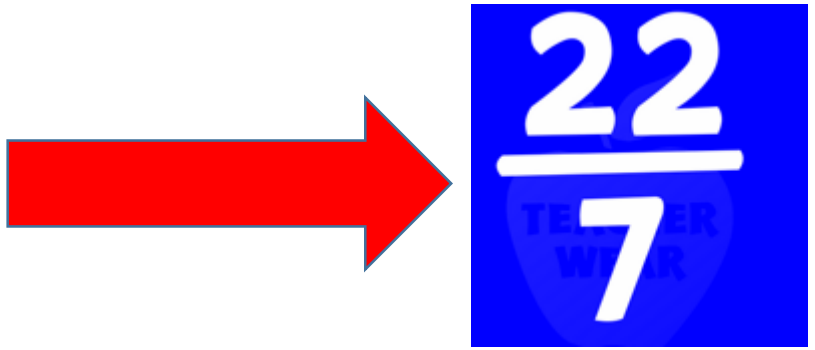
Surface area = 4 x pi x r^2

pi = 3.14
r is the radius

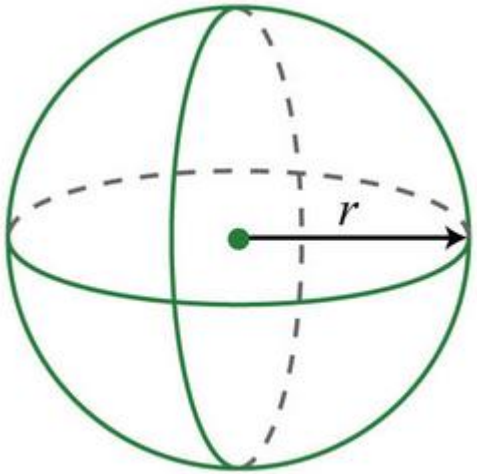


Pi is equal to 3.14

BUT… use



$$SA = 4\pi r^2$$

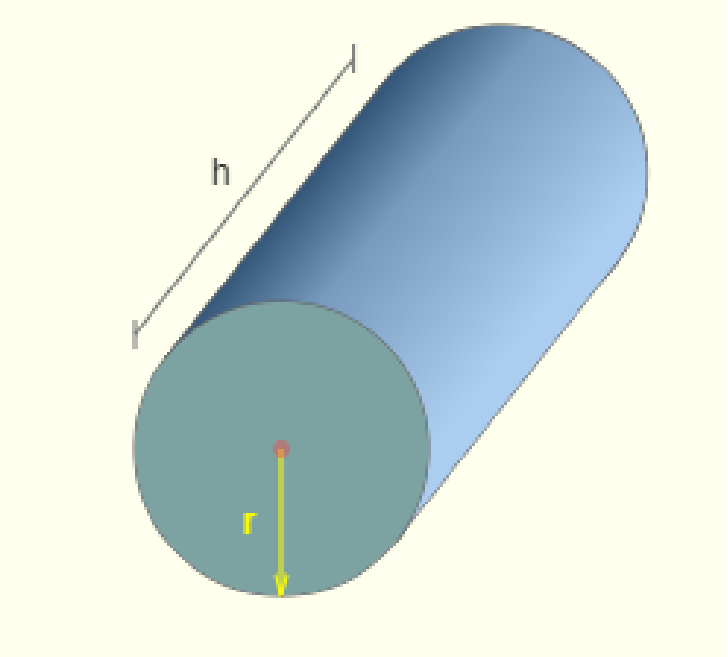


Diameter = 5 ½ cm

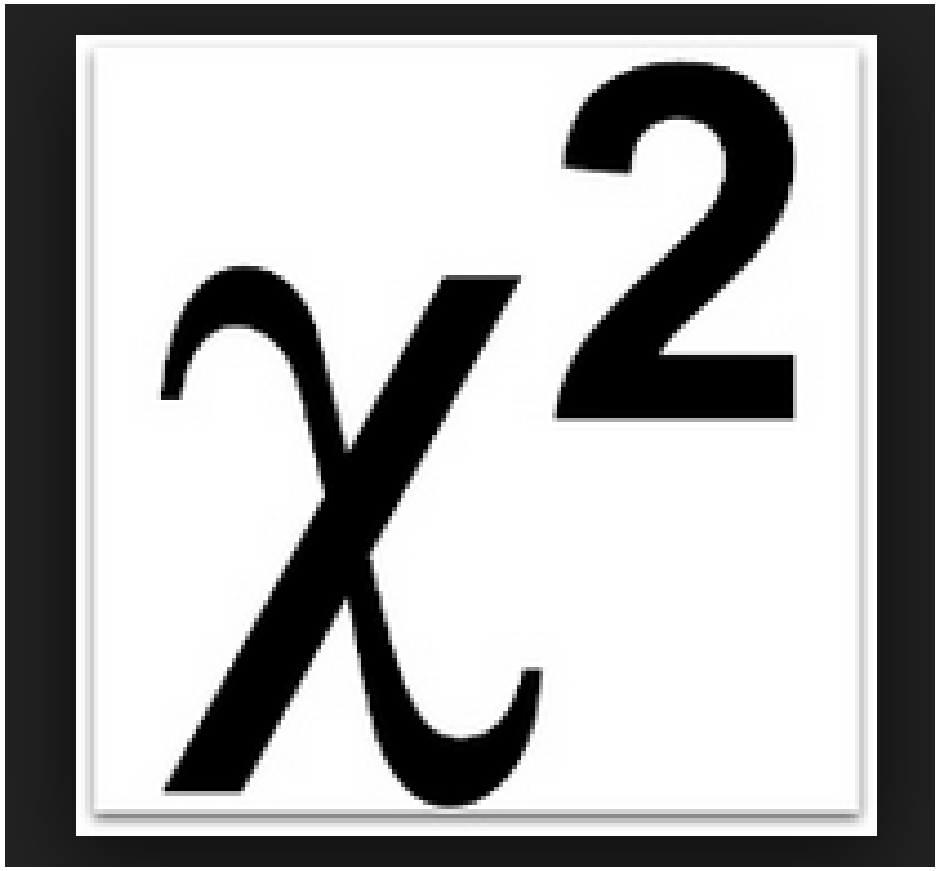
You practice with your teacher!

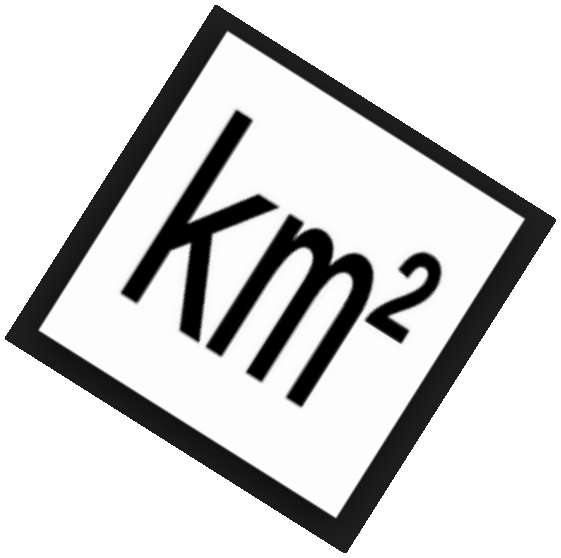
Surface Area

Cylinder



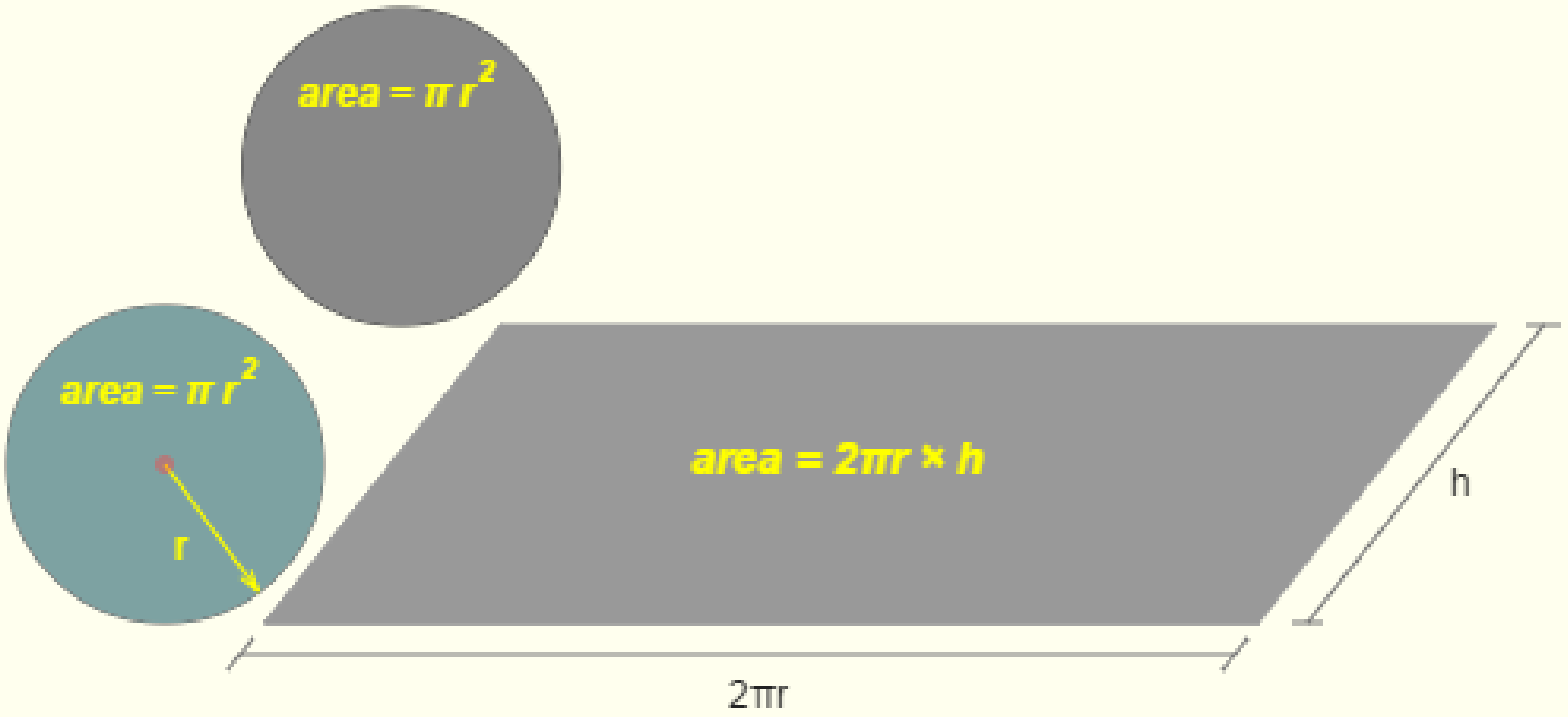
The unit in your answer must be squared because we want to know how many flat squares it takes to cover the shape.

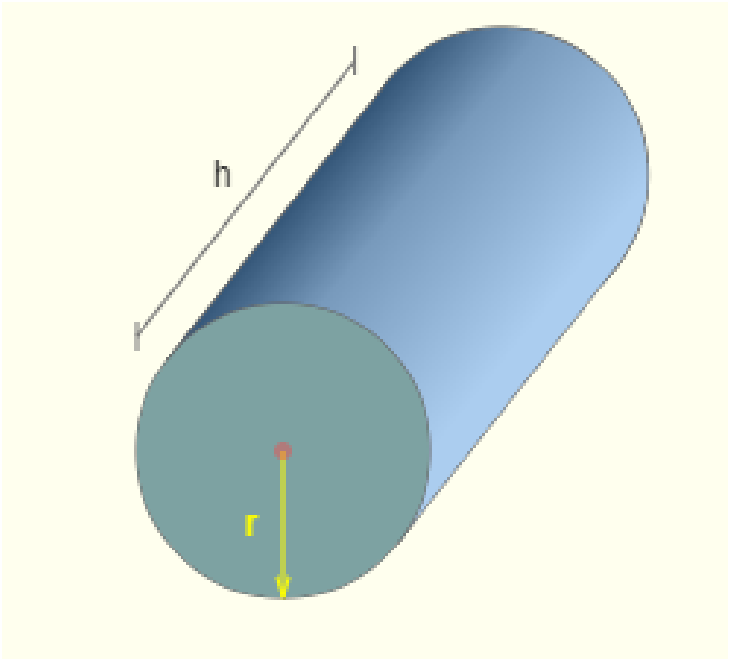




$$\pi = \frac{22}{7}$$

Surface area = $2\pi r^2 + 2\pi rh$





$$\text{Surface area} = 2\pi r^2 + 2\pi rh$$

Radius = 1/3 cm

Height = 4 cm

You practice with your teacher…