

Maths- Skills

This lesson will be live on teams for
your class at;

9am-5L

10am-5H

11am-5M

Learning objective; To calculate the
perimeter and area of squares.

Warm up: square the numbers...

To square a number you multiply it by itself, we will see how this links to shapes shortly.

e.g. $3^2 = 3 \times 3 = 9$ so $3^2 = 9$

1. $5^2 =$

2. $10^2 =$

3. $1^2 =$

4. $8^2 =$

5. $12^2 =$

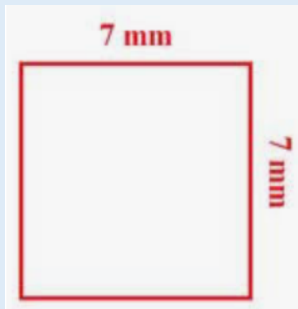
6. $23^2 =$ (you may need to use a column method)

Area and perimeter without a grid

Last week we looked at calculating area and perimeter on a grid, it consisted of counting squares on the inside and outside of a shape.

However

Normally we will not be given shapes on a grid, but more commonly we are given certain measurements of a shape, we can then use this to calculate the length around the outside of a shape (perimeter) and the space inside a shape (area).



Look at this square, what can you tell me about it?

Area

Area is the space inside a shape.

Without a grid we calculate it by multiplying the **height** by the **width (base)**.

On squares, the height and the width are the same size.

So you would need to multiply a measurement by itself.

(just like when we *square* a number)

Can you find the area of these squares

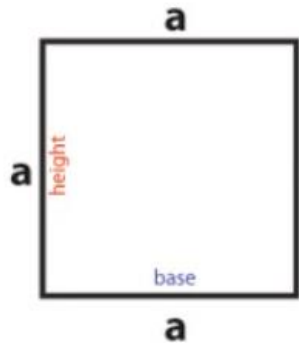
The area of a shape is always recorded as the answer squared, use the ² symbol after each answer (for area) e.g.
36 cm ²

Area of a square

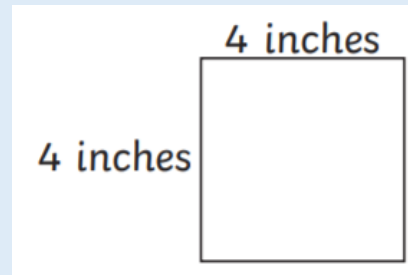
Since it is a square all sides are equal in length.

$A = \text{base} \times \text{height}$

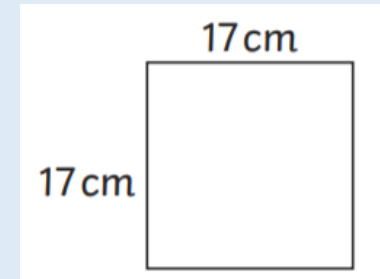
$A = a \times a$
Example:
If $a = 3$ units then
Area (A) = $3 \times 3 = 9$ square units



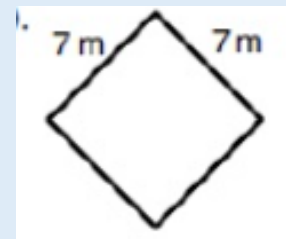
1.



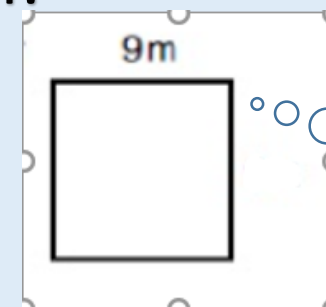
2.



3.



4.



How do I know the height of this square?

Perimeter

Perimeter is the distance around the outside of a shape.

Without a grid we calculate it by adding the distance around the outside.

On squares, the height and the width are the same size and they have 4 sides.

So you would need to multiply one of the lengths by 4.

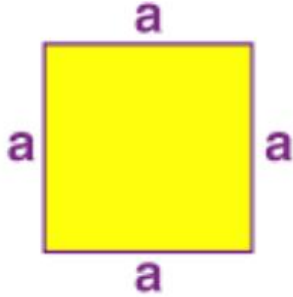
Can you find the Perimeter of these squares

PERIMETER OF SQUARE

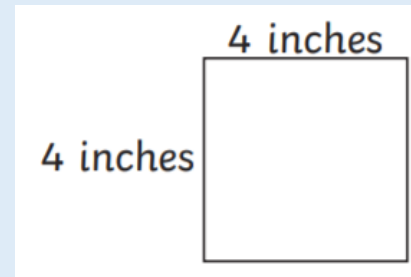
Since it is square
all sides are equal in length
Perimeter (P) = $a+a+a+a$

$P = a+a+a+a$

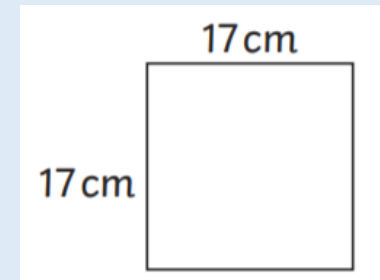
Example:
if $a = 3$ units then
Perimeter (P) = $3+3+3+3=12$ units



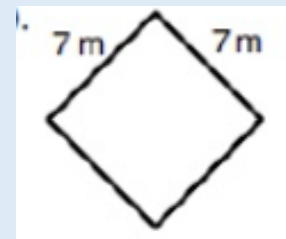
1.



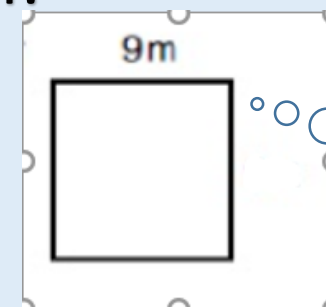
2.



3.



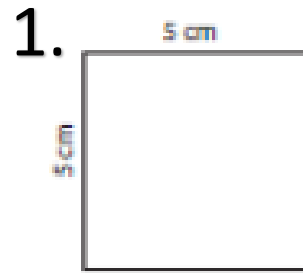
4.



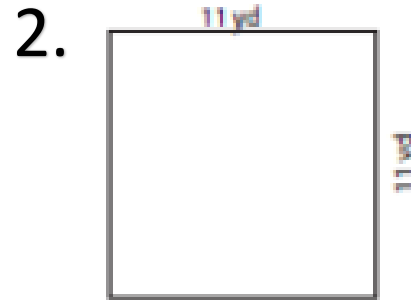
How do I know the width of this square?

Fluency

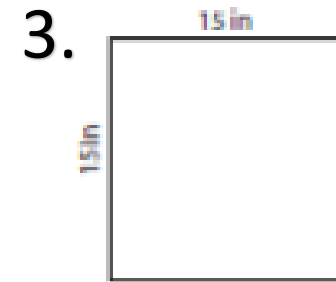
Don't forget to
answer in the
same
measurement.



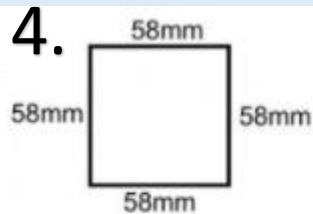
Area : _____
Perimeter : _____



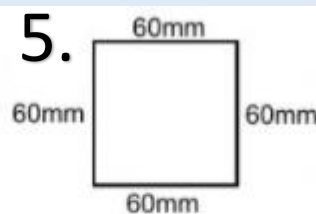
Area : _____
Perimeter : _____



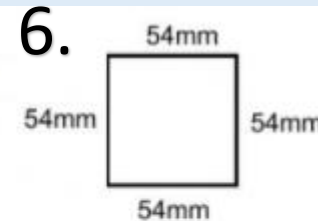
Area : _____
Perimeter : _____



Perimeter: _____
Type: _____



Perimeter: _____
Type: _____



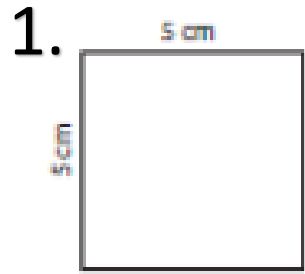
Perimeter: _____
Type: _____

Feeling
confident?
Start here.....

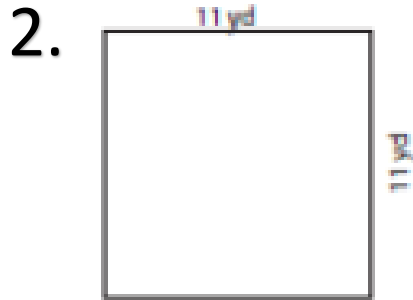
Top Tip
There are some
tricky
multiplications
here, try using the
column method to
help work them
out.

Answers on the next slide

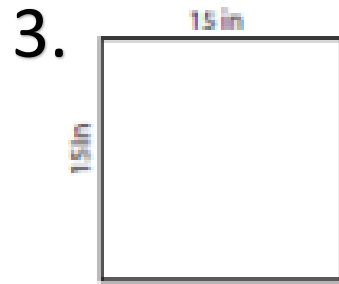
Fluency



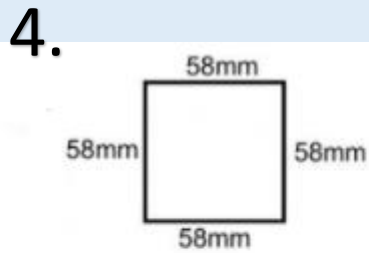
Area : _____
Perimeter : _____



Area : _____
Perimeter : _____

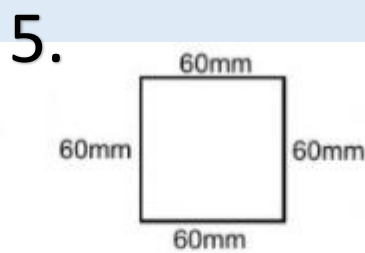


Area : _____
Perimeter : _____



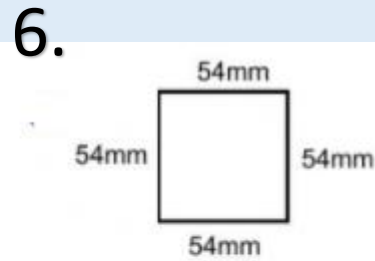
Perimeter: _____

Type: _____



Perimeter: _____

Type: _____



Perimeter: _____

Type: _____

1. $A = 25\text{cm}^2$ $P = 20\text{cm}$

2. $A = 121\text{yds}^2$ $P = 44\text{yds}$

3. $A = 225\text{ins}^2$ $P = 60\text{ins}$

4. $A = 3364\text{mm}^2$ $P = 232\text{mm}$

5. $A = 3600\text{mm}^2$ $P = 240\text{mm}$

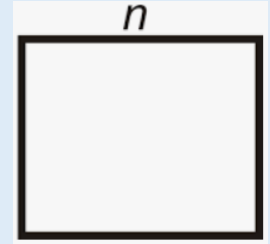
6. $A = 2916\text{mm}^2$ $P = 216\text{mm}$

Reasoning

Using our knowledge around area and perimeter we can find the width and height of a square just by knowing its perimeter.

If this square has a perimeter of 24cm, what is its width (n) ?

Can you then tell me its area?



(To work out the size of one side we need to divide it by 4.)

1. A square has a perimeter of 28mm.
What is the size of one side?
What is the area?

2. A square has a perimeter of 100yds.
What is the size of one side?
What is the area?

3. A square has a perimeter of 68km.
What is the size of one side?
What is the area?

Rectangles

A rectangle is another 4 sided shape however unlike a square, each side can not be the same length.

To work out the area of rectangle we apply the same rule; height x width

To work out the perimeter we need to add all the sides together. The height will be the same on the left hand side and right hand side, the width will be the same on the top and the bottom, so we could calculate; (height x 2) + (width x 2) or (height + width) x 2

Area of a Rectangle

Area of a Rectangle = Length x width



3cm
9cm

Calculate the area

$$A = l \times w$$
$$A = 9 \times 3$$

Find the Perimeter



5cm
3cm
3cm
5cm

length = 5cm
width = 3cm

$$P = 5\text{cm} + 3\text{cm} + 5\text{cm} + 3\text{cm} = 16\text{cm}$$

Formula: $P = 2l + 2w$

$$P = 2(5\text{cm}) + 2(3\text{cm})$$
$$P = 10\text{cm} + 6\text{cm}$$

Lets look at
some
examples
with Mr L