Antelope Class
Maths
Term 6, Week 3 learning - 15.6.20

Geometry - position and direction

Hello Antelopes, well done for all of your hard work so far. This week, we are going to look at coordinates and translating shapes on a grid.
Keep sending pictures of your work to antelopes@bratton.wilts.sch.uk, every few days or at the end of the week. It is great to see how you have been getting on. There are 5 lessons in this learning guide, which will last approximately 30-40 minutes.
If you finish before, please make use of Mathletics and Professor Assessor.
Thank you, Miss McMillan and Mrs Smith.

Lesson 1

To find, plot and describe coordinates.

Warm-up - Make 36

How many different ways can you find to make 36 using the numbers below?

Can you find a way for each different operation? (+ - x ÷)
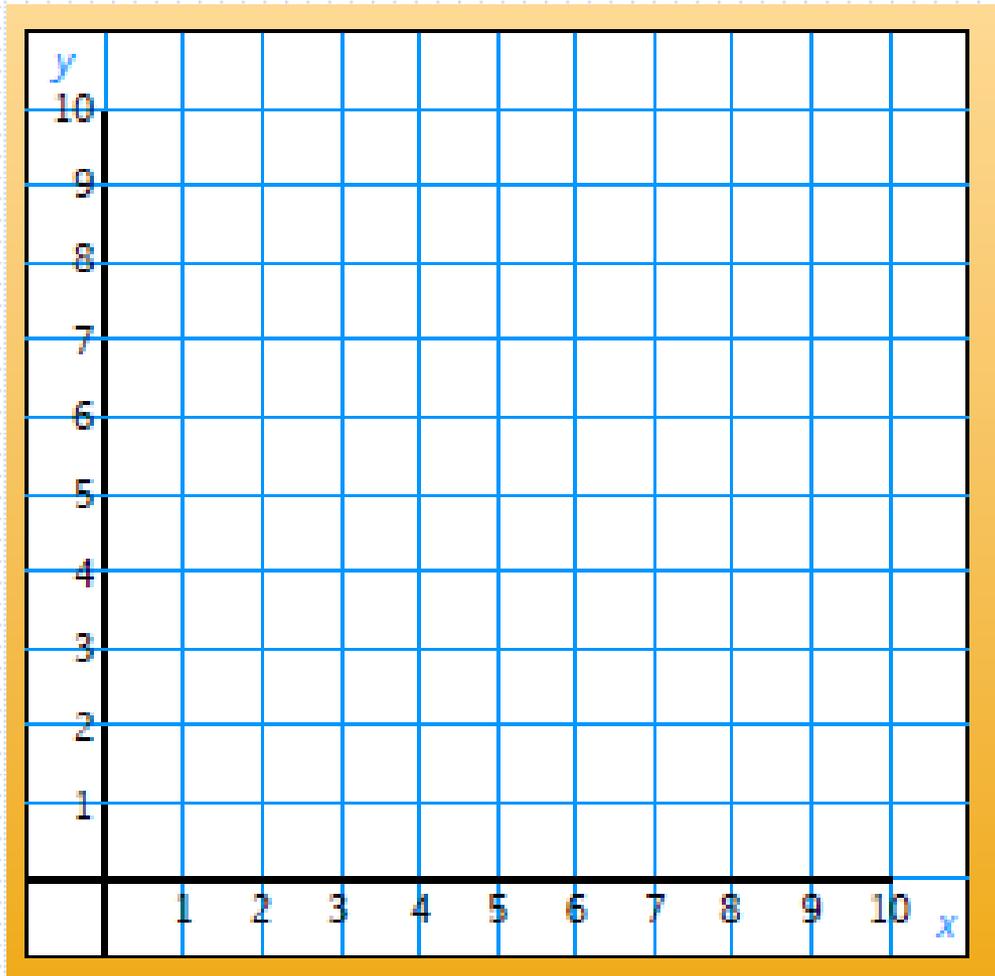
1	2	3
4	5	6
7	8	9

What do we use grids like this for?

Do you know the features of this coordinate grid?

o What are the lines called?

o What do the numbers show?

We can use a grid like this for:
- Pictograms
- Bar graphs
- Line graphs
- Plotting coordinates.

axes

The divisions along each axis are called the scale.

The scales on this grid go up in intervals of 1.

scale

Coordinate grids have a pair of axes. This horizontal axis is called the '**x axis**'. The vertical axis is called the '**y axis**'.
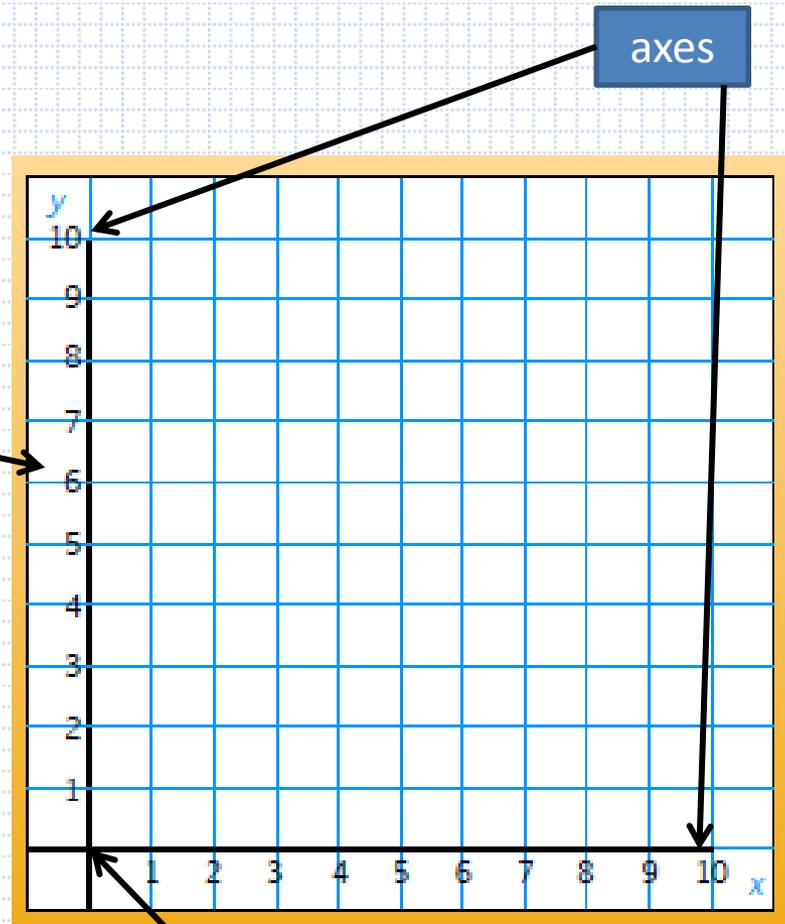
You can remember it as:
X = across (a- cross)
Y = to the sky

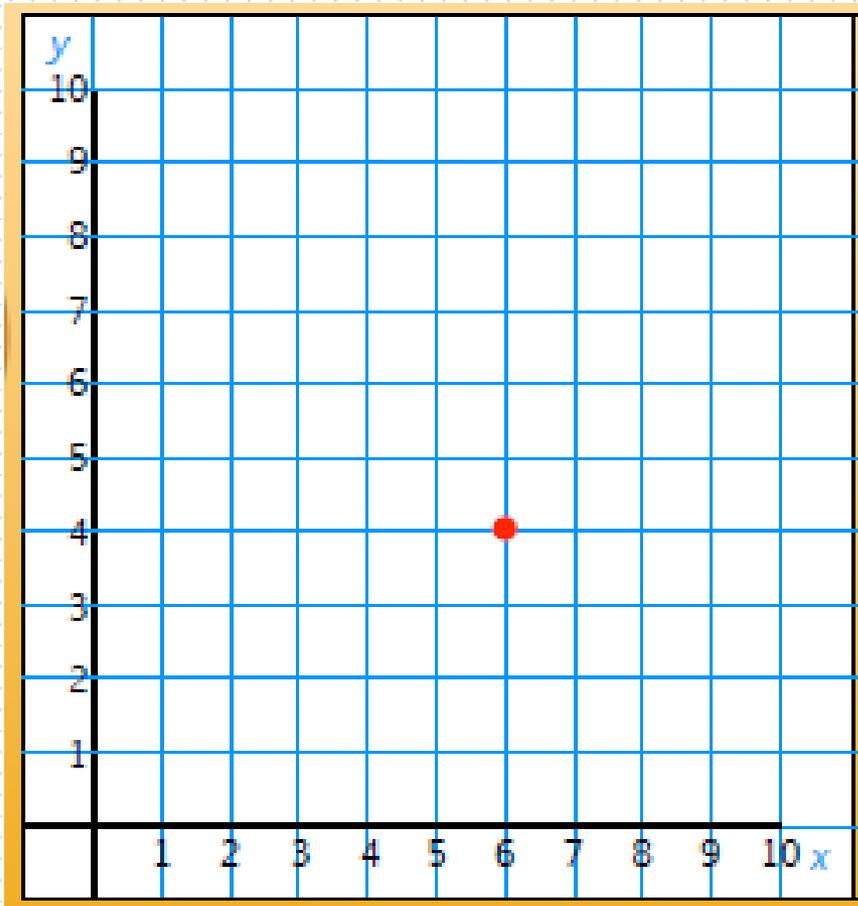origin

The axes meet and cross over at the **origin**.

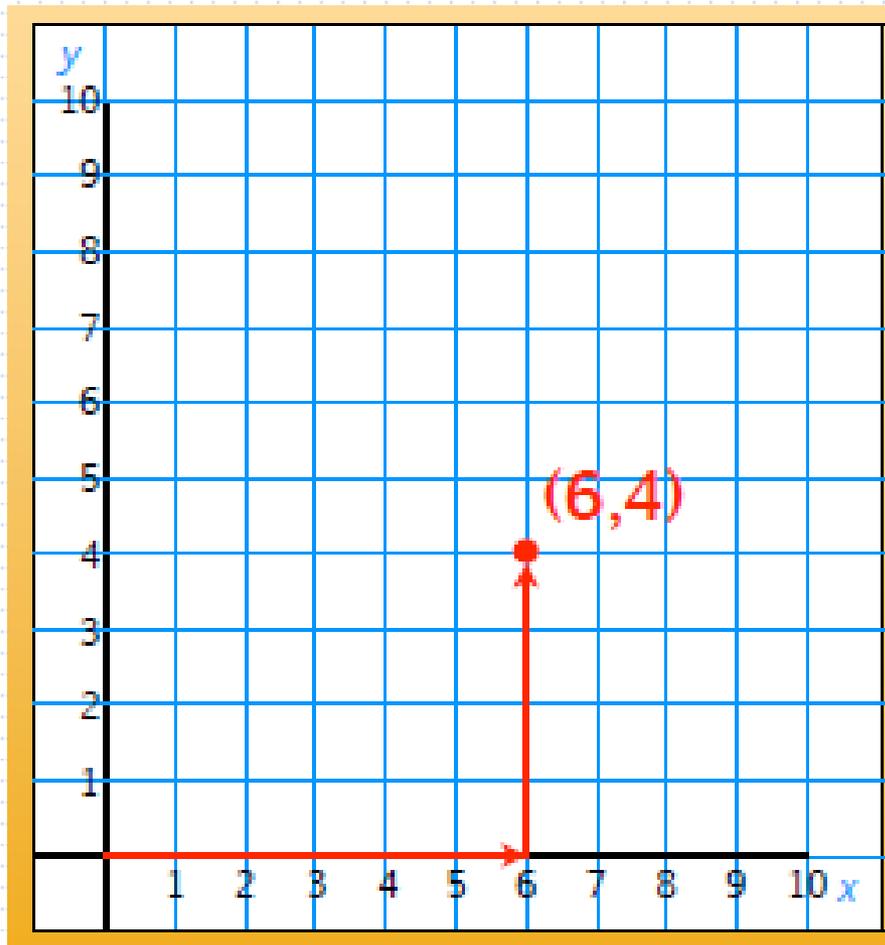What is a coordinate?

What is a coordinate?

A coordinate is a set of numbers, which describes a location on a grid.

The coordinate of the red dot is **(6,4)**

Can you explain why?

The coordinate of the red dot is **(6,4)** because it is 6 squares to the right of the origin, and 4 squares up from the origin.

Coordinates are called ordered pairs. This is because the order of the numbers is important. The number describing the position along the **x axis** is always written first.

(6,4)

Always remember: **Along the corridor, up the stairs** to plot a coordinate.
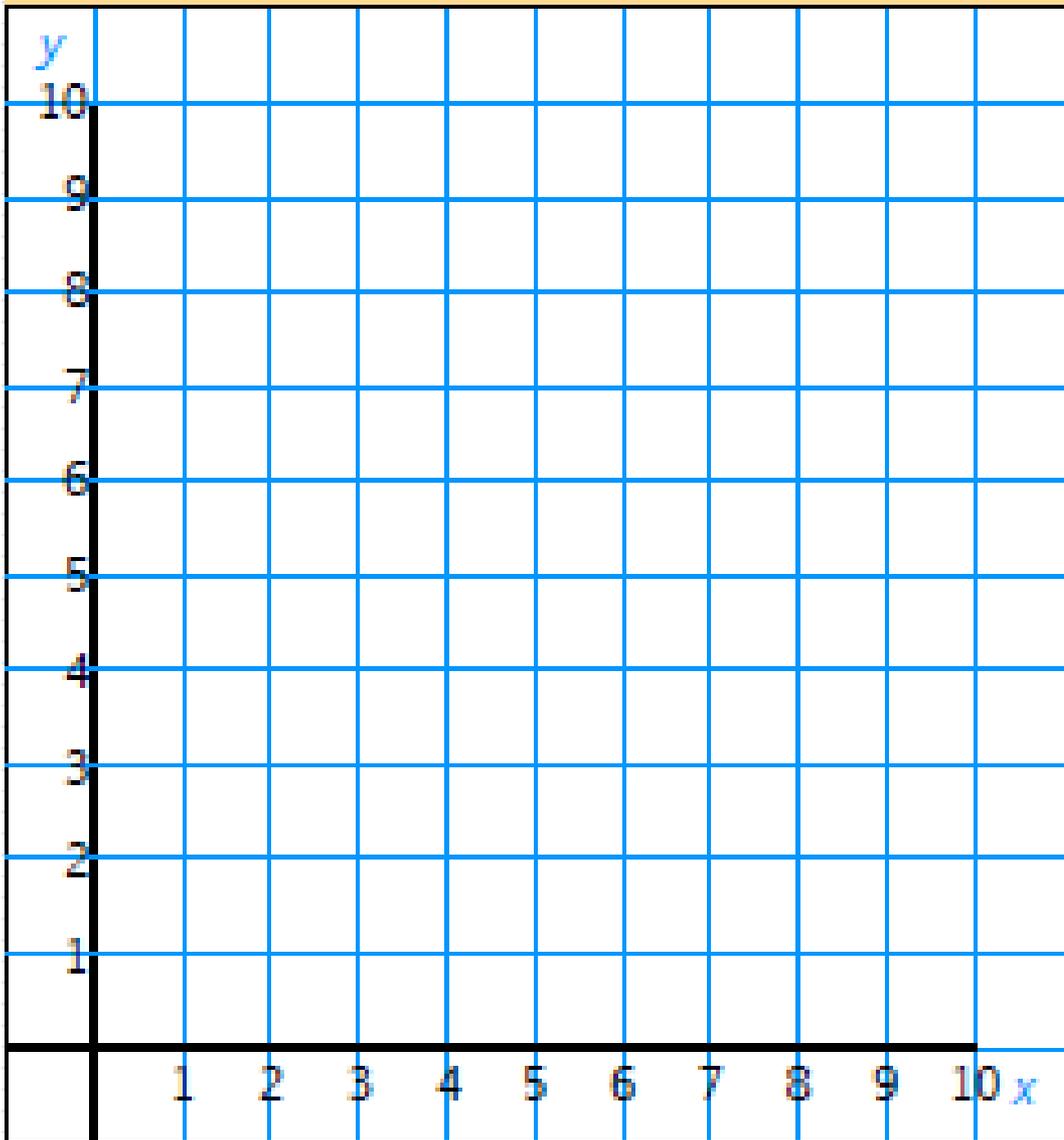
Can you find the location of the coordinates and plot them on the grid?
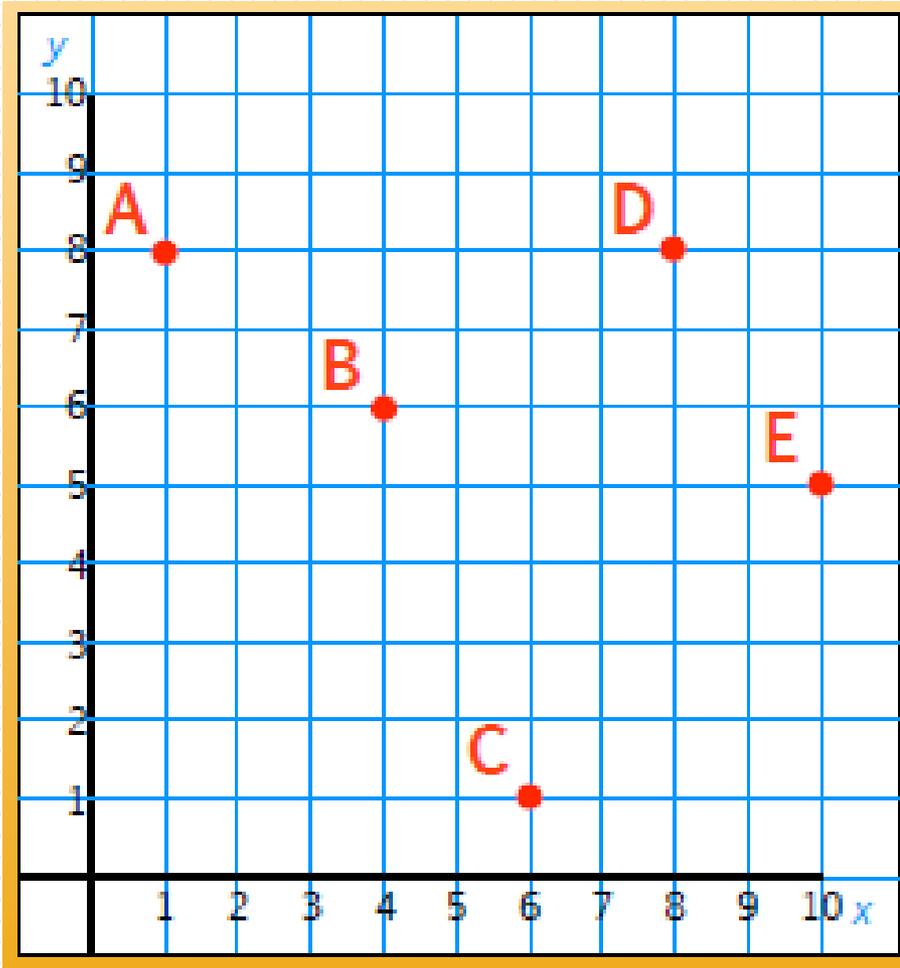
(2,1)
(3,6)
(8,7)
(5,10)
(7,3)

Five locations have been plotted on this grid.
Can you write these coordinates?
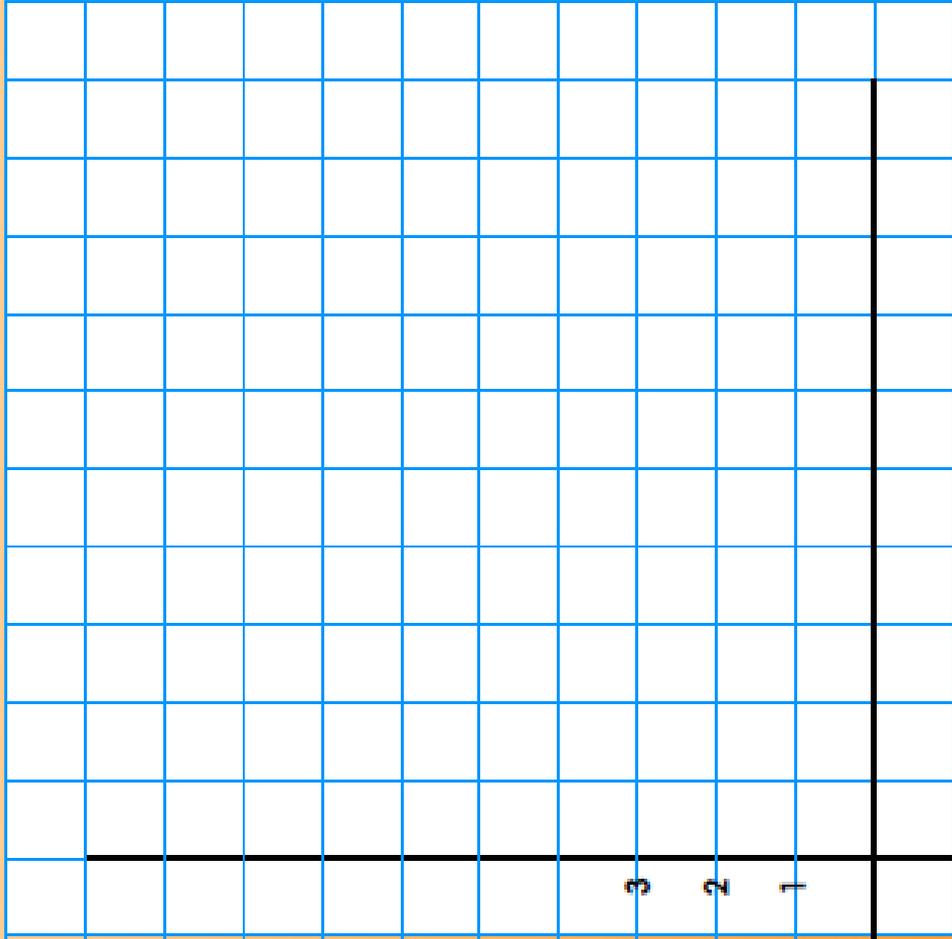

A =

B =

C =

D =

E =

Please complete the following worksheet:

Extension

Write out the coordinates to spell your name.

E.g.
Tom
T (1,7)
O (10,1)
M (1,4)

Lesson 2

To plot specified points and draw sides to complete a given polygon.

The rectangle on this grid is called 'rectangle ABCD'. This is because its corners, or vertices, have been labelled with the letters A, B, C and D.
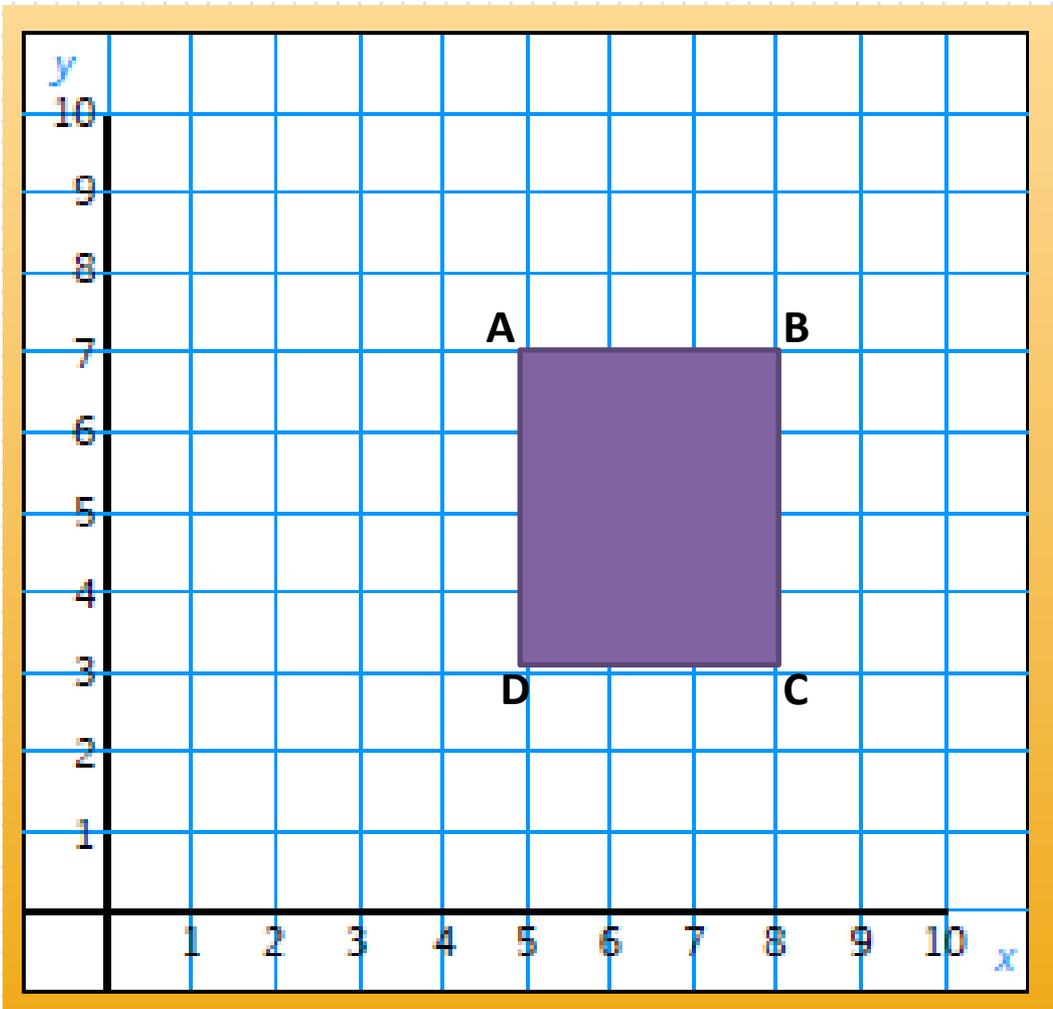
One way of describing the location of a shape on a grid is by the coordinates of the rectangle's vertices:
- A.   (5,7)
- B.   (8,7)
- C.   (8,3)
- D.   (5,3)

Coordinates which describe a shape are usually written like this:
(5,7) (8,7) (8,3) (5,3)

Can you plot these coordinates on a grid?

(2,2) (8,2) (8,7) (2,7)

What shape do you think they might describe?

Plot the coordinates first and then draw lines to connect them, starting with the first coordinate given.

The order of the coordinates tells you the order in which to draw lines connecting them.
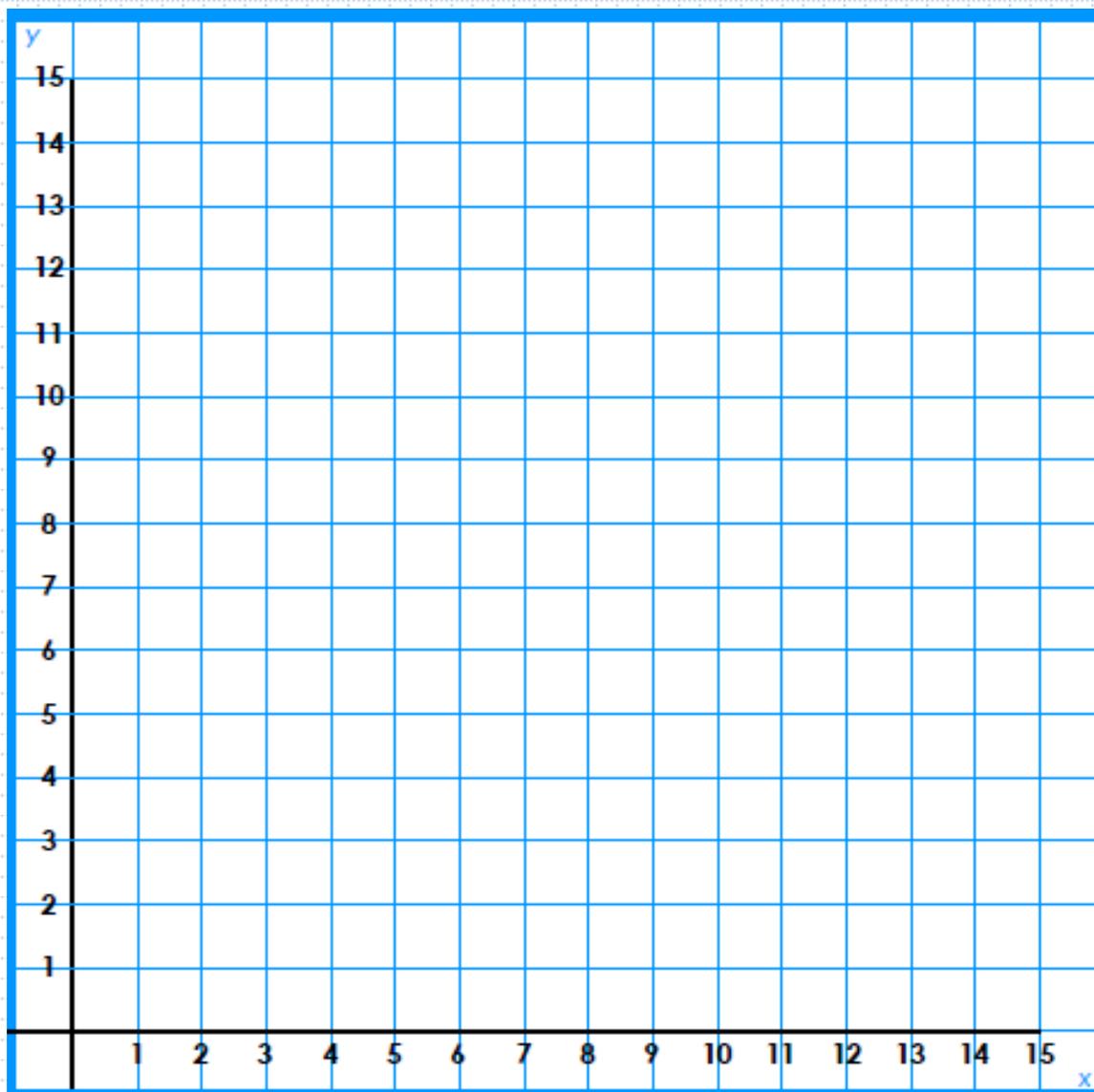
Connecting the coordinates in a different order will not show the shape being described.
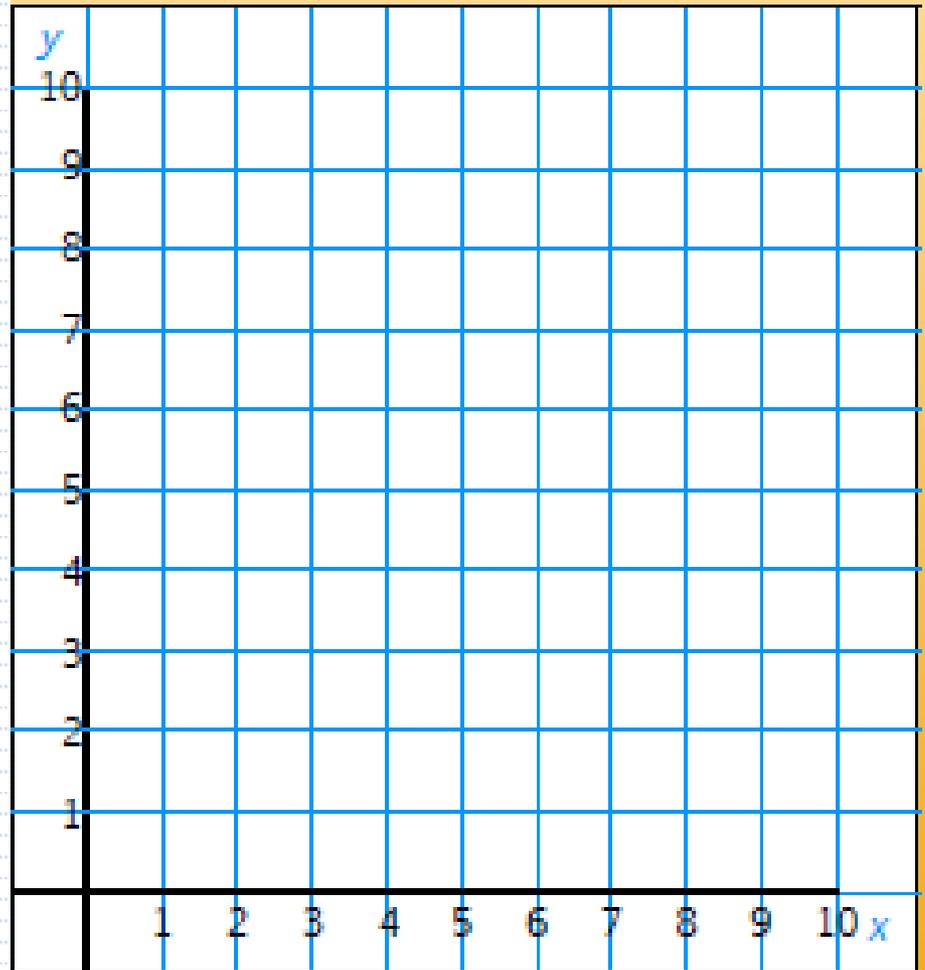
Activity:
Plot each set of coordinates, drawing lines to connect them and make polygons.

Extension questions are on the next slide.

1. (10,5) (11,3) (6,3) (5,5)
2. (6,14) (15,14) (15,15) (6,15)
3. (0,10) (1,6) (6,9)
4. (13,7) (13,9) (15,9) (15,7)
5. (1,0) (7,2) (1,4)

6. (11,2) (10,2) (10,1) (11,1)
7. (2,15) (2,12) (5,11) (5,14)
8. (14,2) (15,4) (14,6) (12,6) (11,4) (12,2)
9. (10,13) (7,10) (10,11) (13,10)
10. (6,6) (7,9) (10,9) (11,6)

Extension questions:

1. How many quadrilaterals did you draw?
2. How many triangles did you draw?
3. How many shapes are touching the x or y axes?
4. Which shapes are the highest?
5. Which shapes are the furthest to the right?
6. Which shape is the lowest?
7. Which shape is furthest to the left?
8. Which shapes are regular?

Reasoning question

What shapes could be made by plotting three more points on this grid? Write down the coordinates you add.
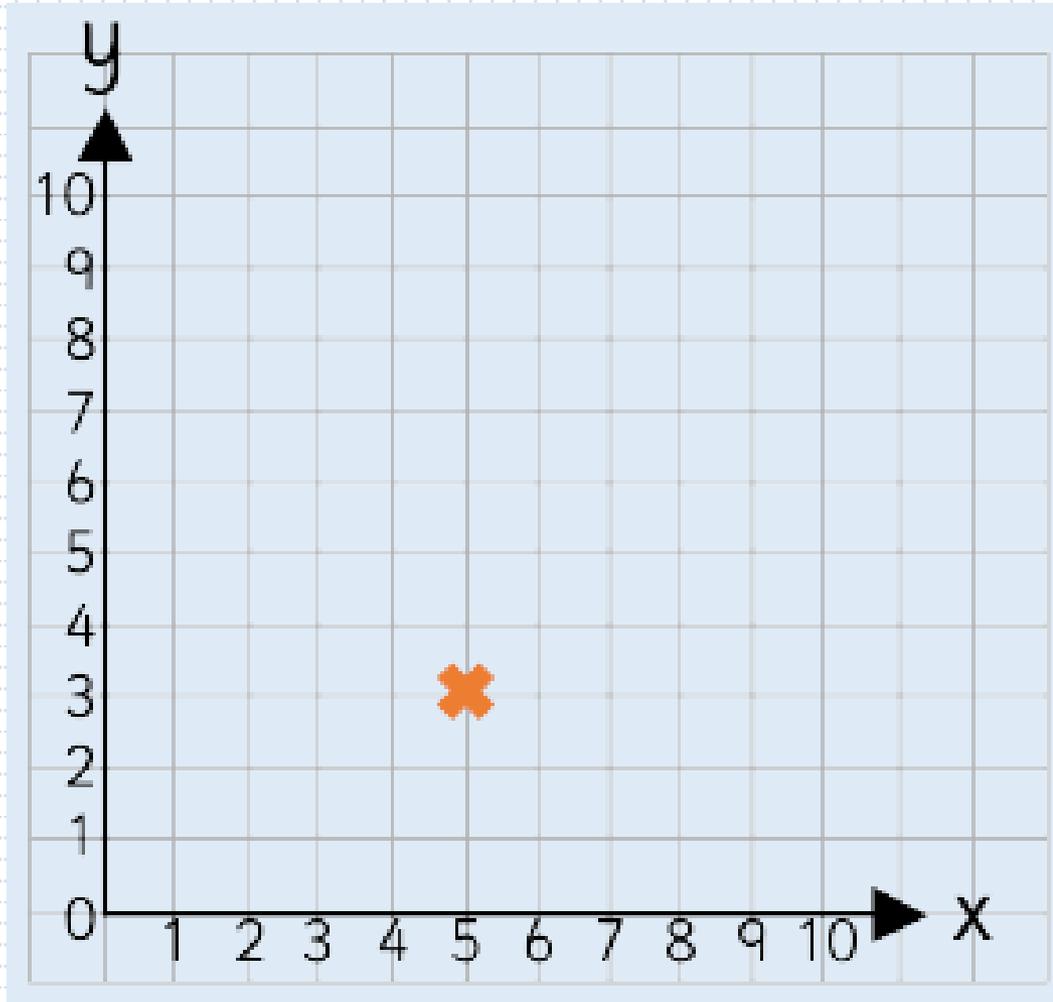
Lesson 3

To describe movements between coordinates on a grid as translations.

Warm-up activity:

Follow the link to the **'Daily 10'** mental maths activities.
https://www.topmarks.co.uk/maths-games/daily10

Choose Level 4, Addition and four-digit numbers.

Choose 15-20 seconds and have a go at adding the numbers as quickly as you can.
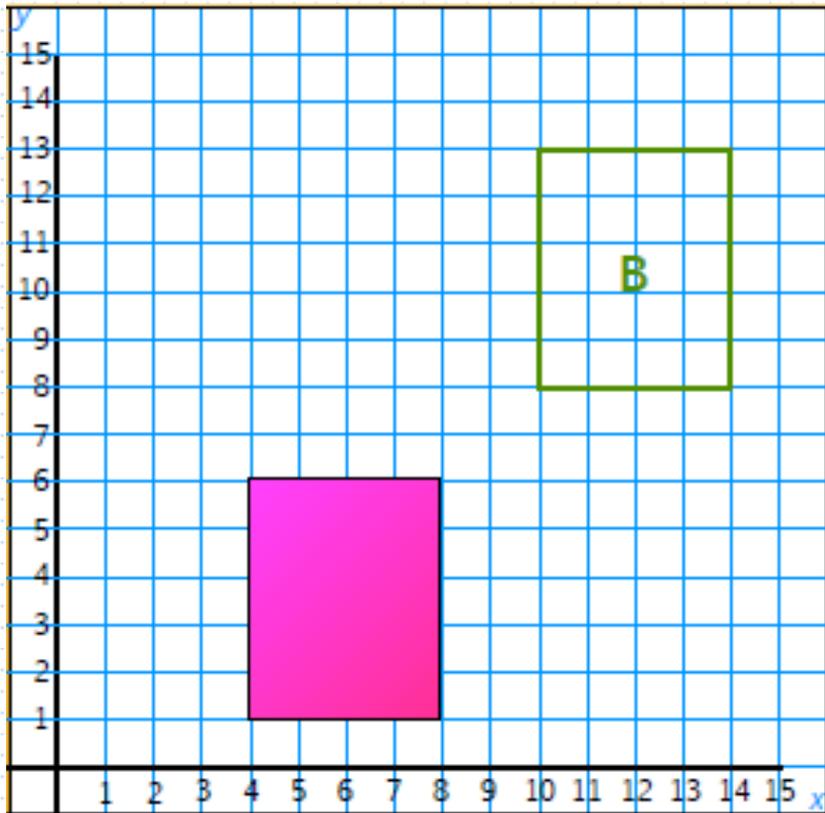
If you need more time, adjust the time setting.

What does translation mean?

In geometry, **translation means moving a shape into a different position** without changing it in any way.

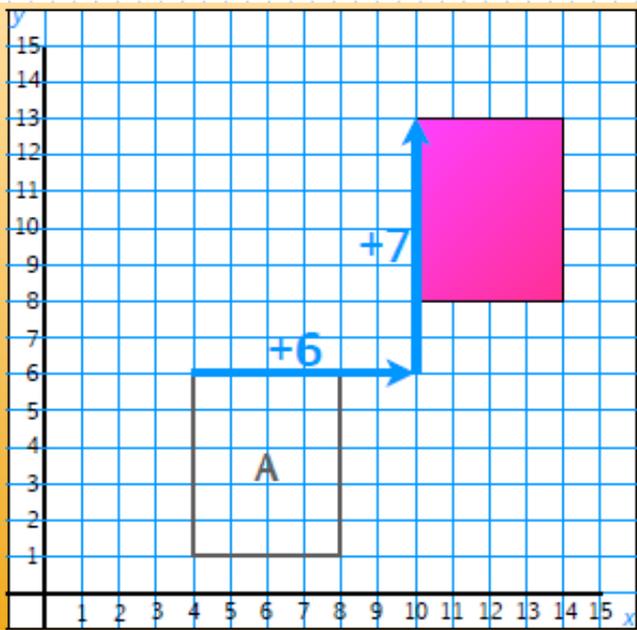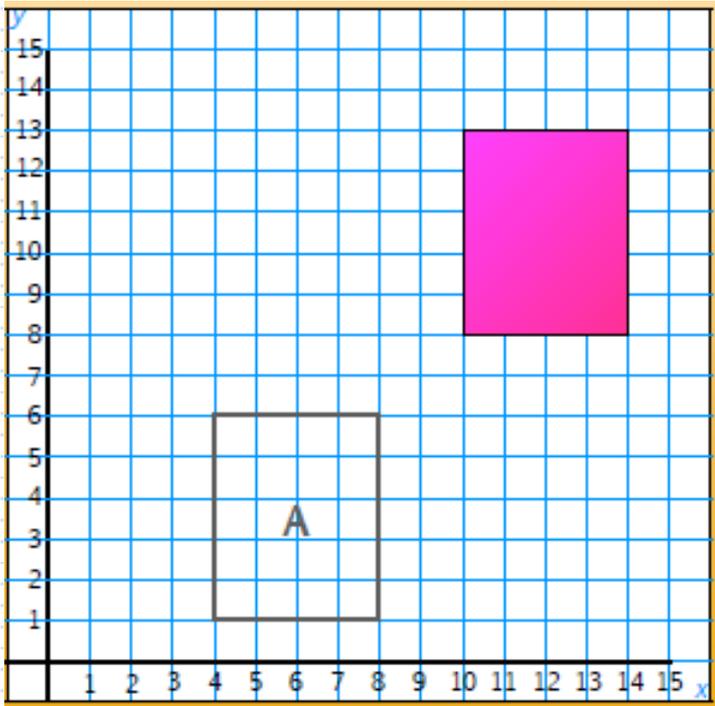Watch the following video to see how to translate a shape:
https://www.youtube.com/watch?v=8Dtz5fBe7_Q

I am going to move the pink rectangle so that it is in the location 'B'.
What will its new coordinates be?
How can we describe how it will move?

The coordinates of the pink rectangle are now:

(10,13), (14,13), (14, 8), (10,8)

The movement of the rectangle can be described in terms of its movement along the x axis and up / down the y axis.

The rectangle has moved six squares to the right along the x axis and seven squares up the y axis.

What is a translation?

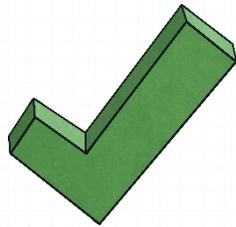This is **not a translation** because the **shape has been rotated**.

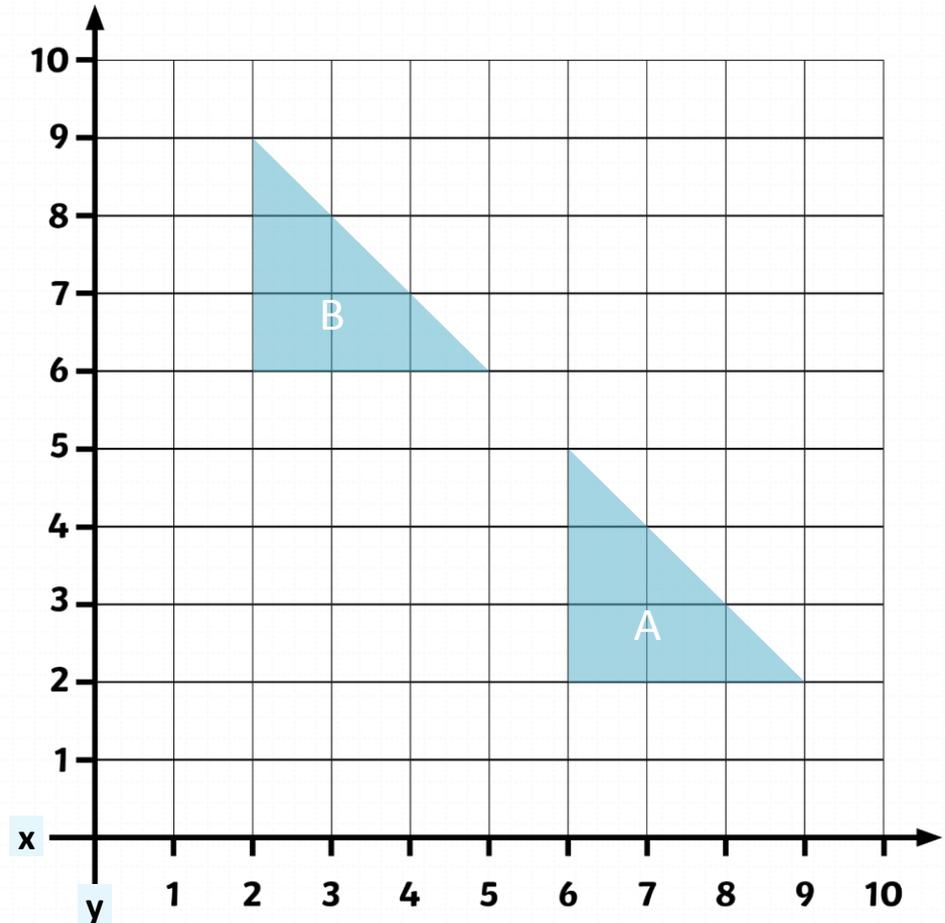The shape needs to be exactly the same, just in a different position on the grid.
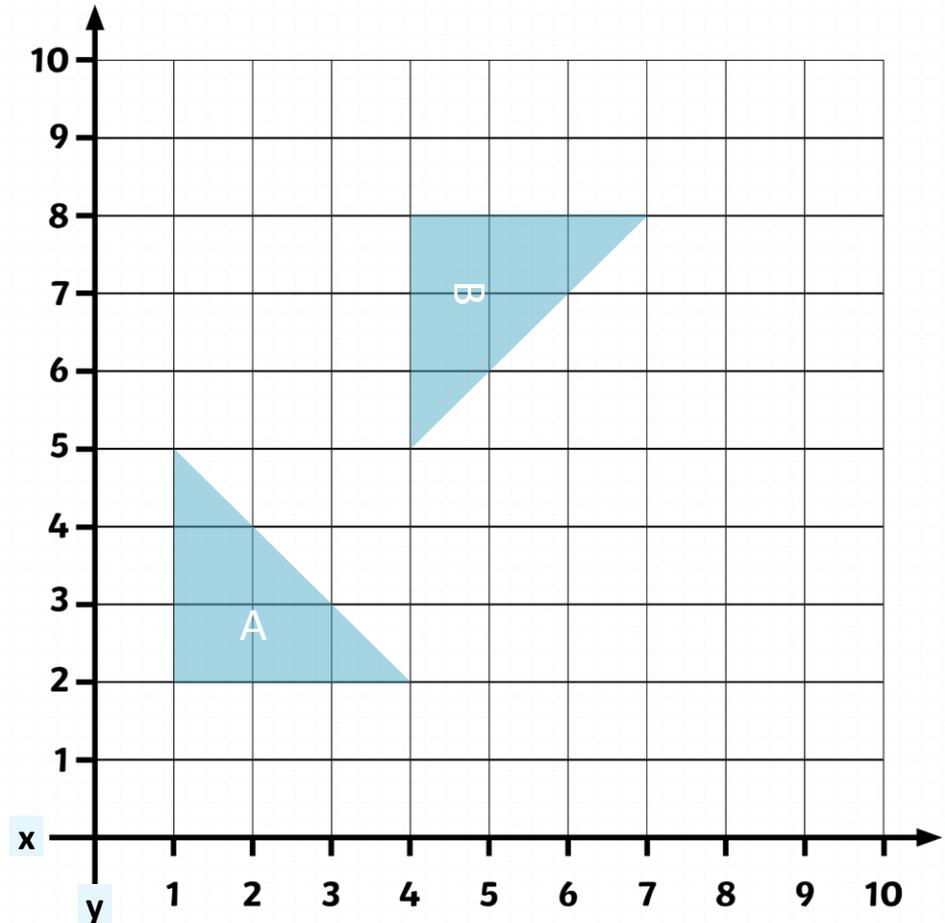
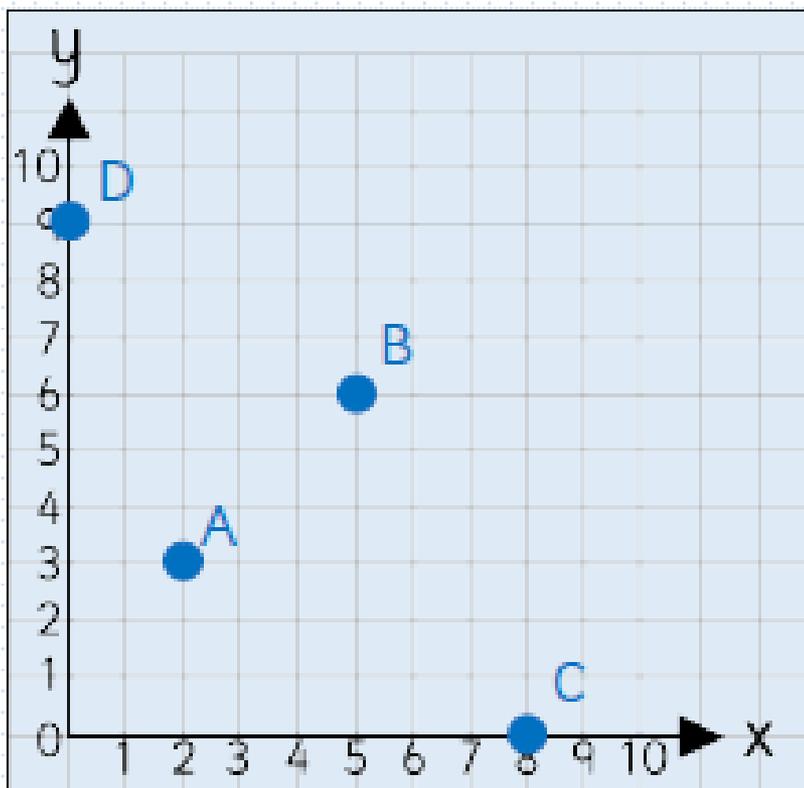# Translating Shapes

Is this a translation?
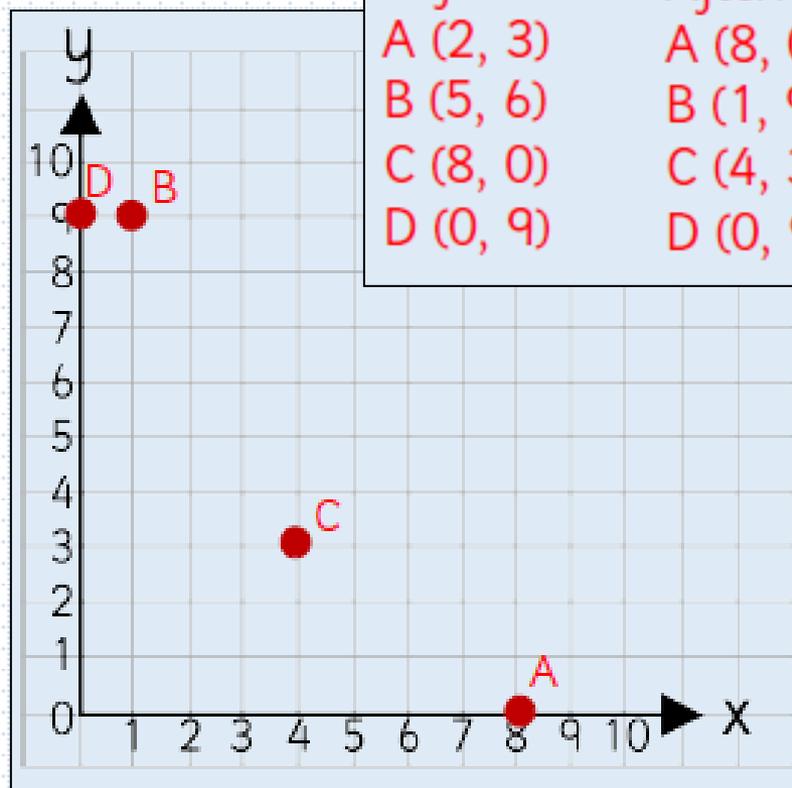
Yes

This is a translation.

Example:

Translate **A** 6 right and 3 down.
Record the coordinates before (__,__) and after (__,__).
Translate **B** and **C** 4 left and 3 up.
Record the coordinates before (__,__) and after (__,__).

Original

Translated

Before:
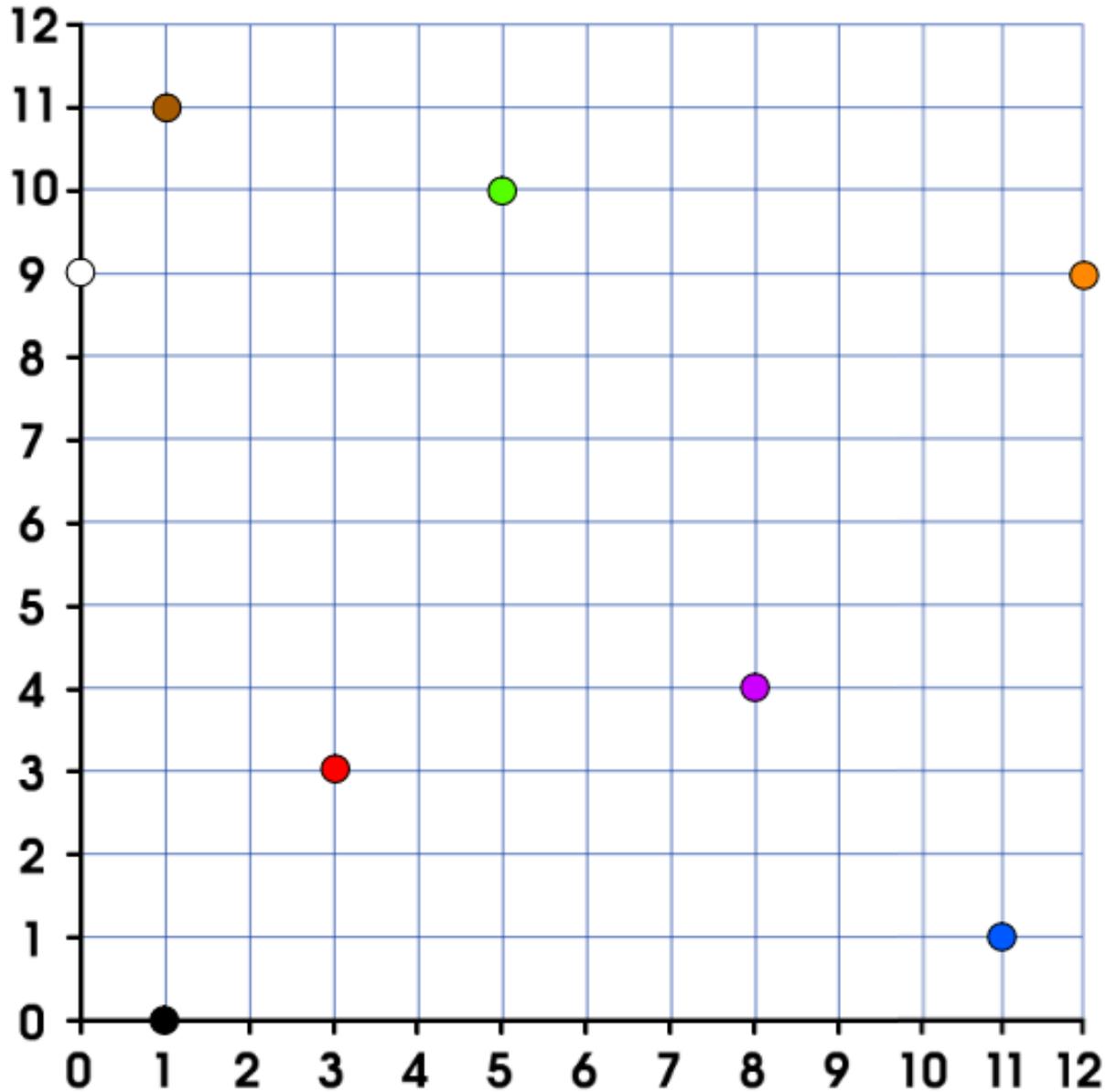A (2, 3)
B (5, 6)
C (8, 0)
D (0, 9)

After:
A (8, 0)
B (1, 9)
C (4, 3)
D (0, 9)

Activity 1 - For each of the dots, write down the coordinates, then translate them and write the new coordinates. The translations are on the following slide.

Activity 1 - For each of the dots, write down the coordinates, then translate them and write the new coordinates.
The translations are below for each dot.

🟢 = (,) translate right 4, down 2.   New coordinates (,)

⚫ = (,) translate left 1, up 8.   New coordinates (,)

🔴 = (,) translate right 6, up 9.   New coordinates (,)

🟠 = (,) translate left 10, down 6.   New coordinates (,)

🔵 = (,) translate right 1, down 1.   New coordinates (,)

🟣 = (,) translate left 2, up 5.   New coordinates (,)

🟤 = (,) translate right 10, down 5. New coordinates (,)

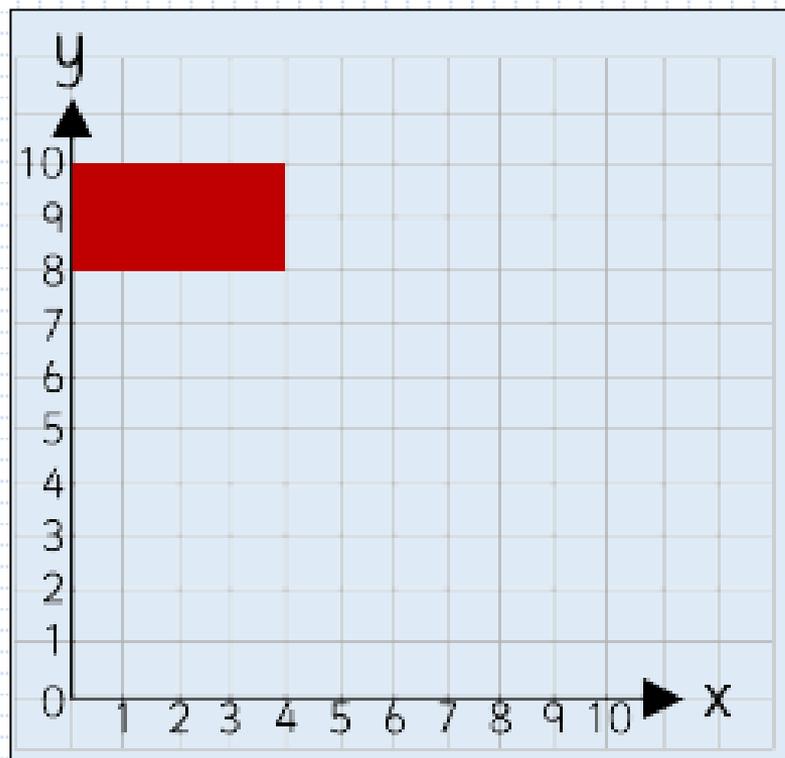⚪ = (,) translate right 2, up 3.   New coordinates (,)

Example:

Translate the rectangle 2 left and 3 up.
Write down the coordinates of each vertex (corner) of the rectangle before and after translation.
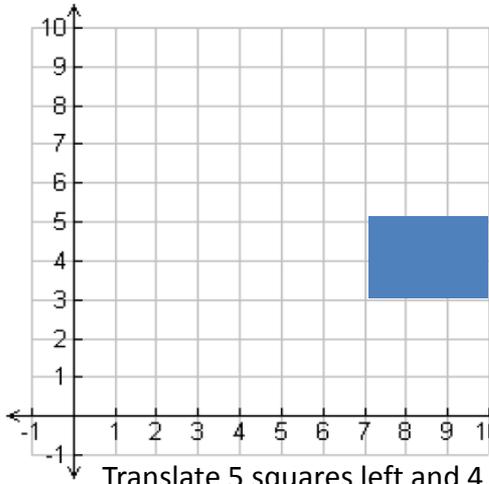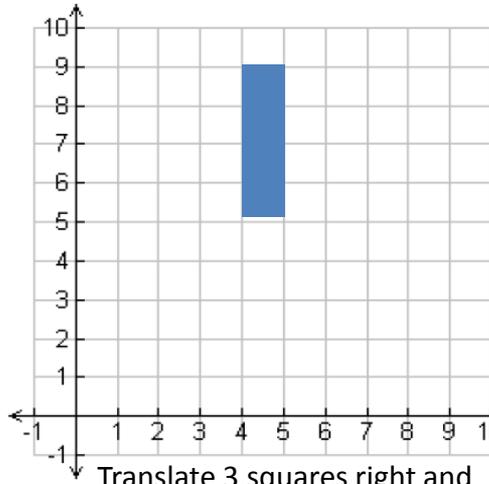
Original
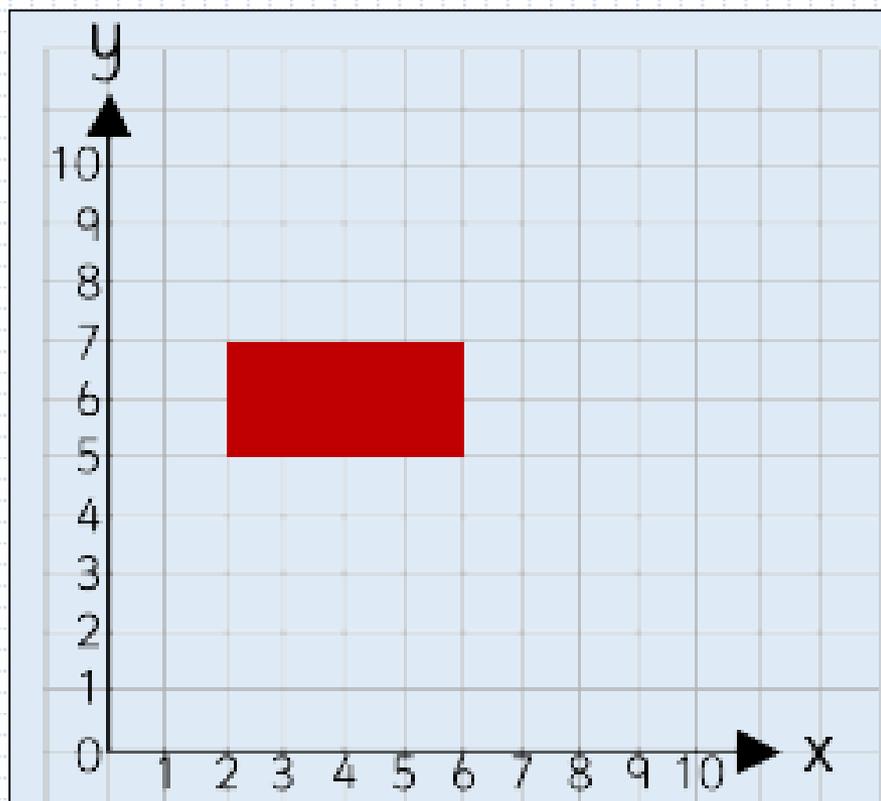
Translated

Before: (2, 5), (6, 5), (6, 7), (2, 7)
After: (0, 8), (4, 8), (4, 10), (0, 10)
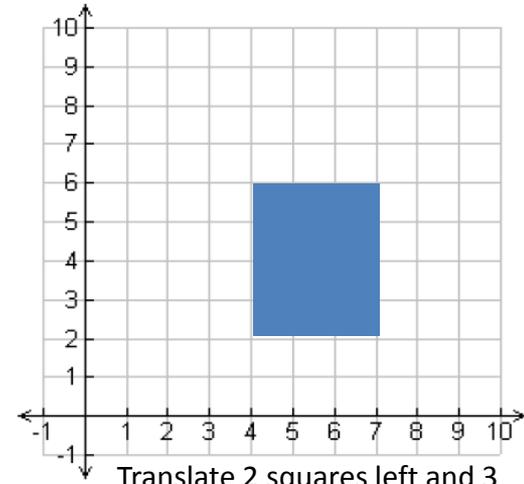
Activity 2 - Translate each shape.
Draw the translated shape and then write down the coordinates of each vertex (corner) of the rectangle before and after translation.
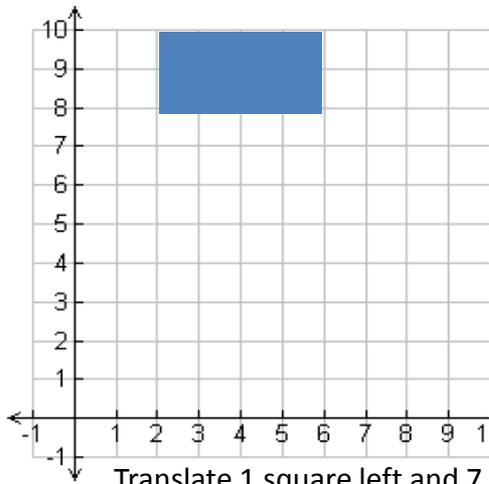

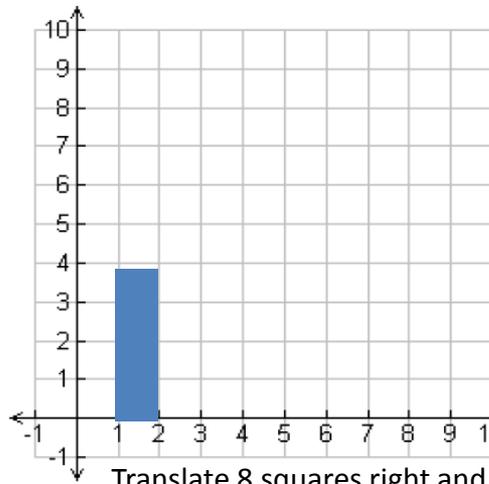Translate 5 squares left and 4 squares up.

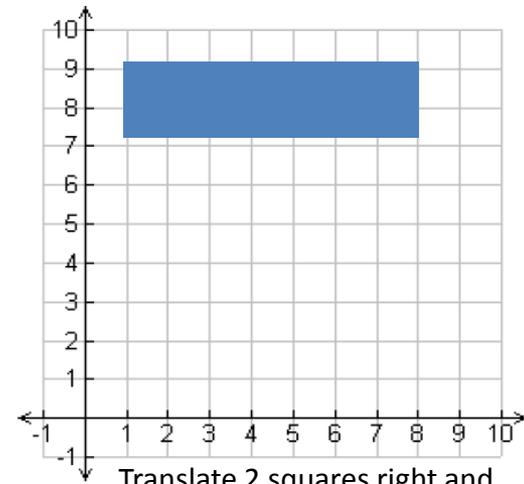Translate 3 squares right and 3 squares down.

Translate 2 squares left and 3 squares up.

Translate 1 square left and 7 squares down.

Translate 8 squares right and 4 squares up.

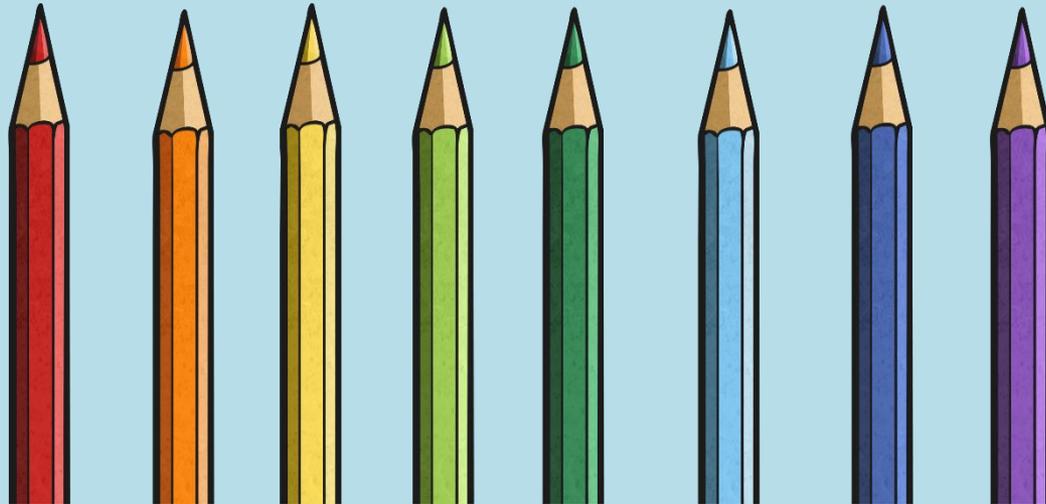Translate 2 squares right and 6 squares down.

Lesson 4

To translate shapes between coordinates on a grid.

Identifying the translation

Please watch the following video, starting at 3:03 until 4:06 https://www.youtube.com/watch?v=8Dtz5fBe7_Q

A rectangle is translated from position A to position B.
Complete the sentence
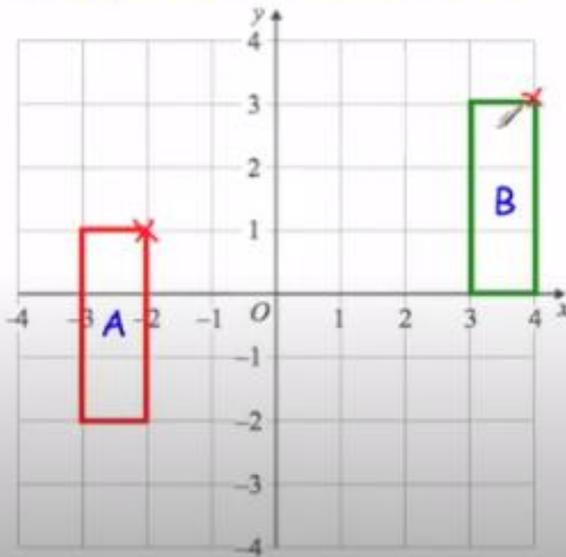
The rectangle has moved ☐ squares to the right

and ☐ squares up

How has this shape been translated from A to B?

The coordinates of the black point on shape A and shape B are **(8,6)** and **(6,1)**, this shows the translation of **2 squares to the left** and
5 squares down.

The coordinates of shape B is **(6,1) (3,1) (3,4)**

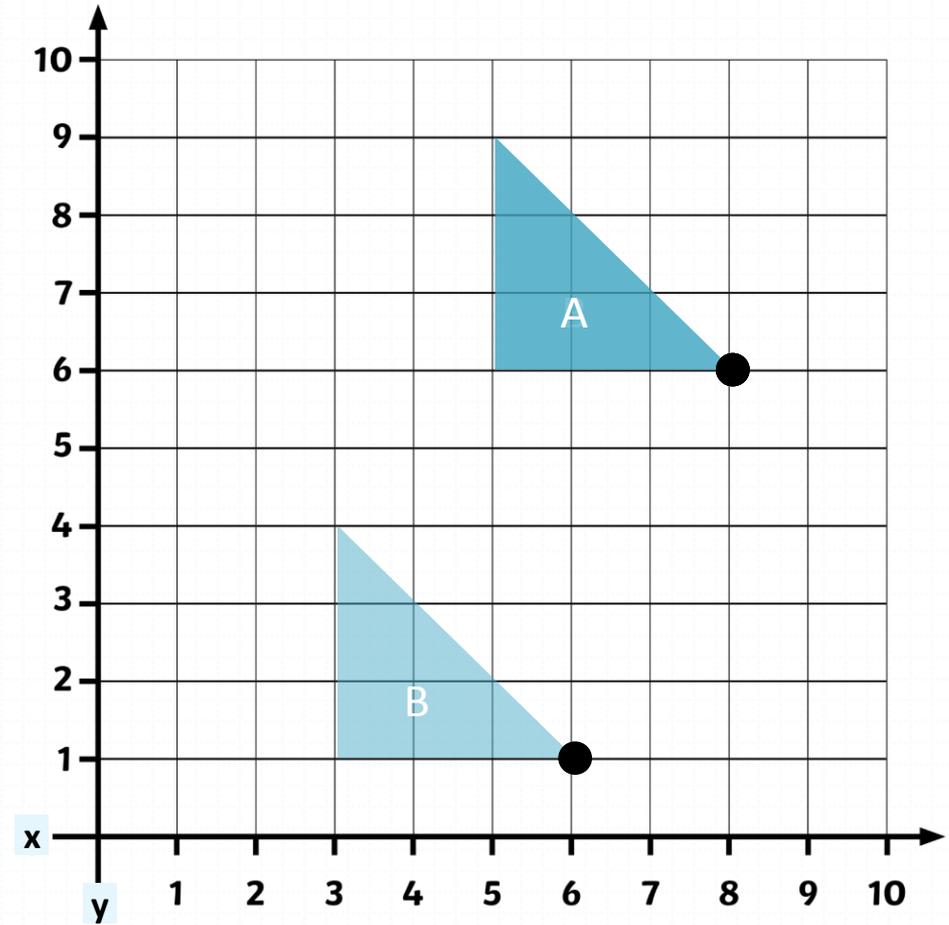# How has this shape been translated from A to B?

The coordinates of the black point on shape A and shape B are **(5,5)** and **(2,8)**, this shows the translation of **3 squares to the left** and **3 squares up.**

The coordinates of shape B are
(2,8) (4,8) (3,5) (1,5)
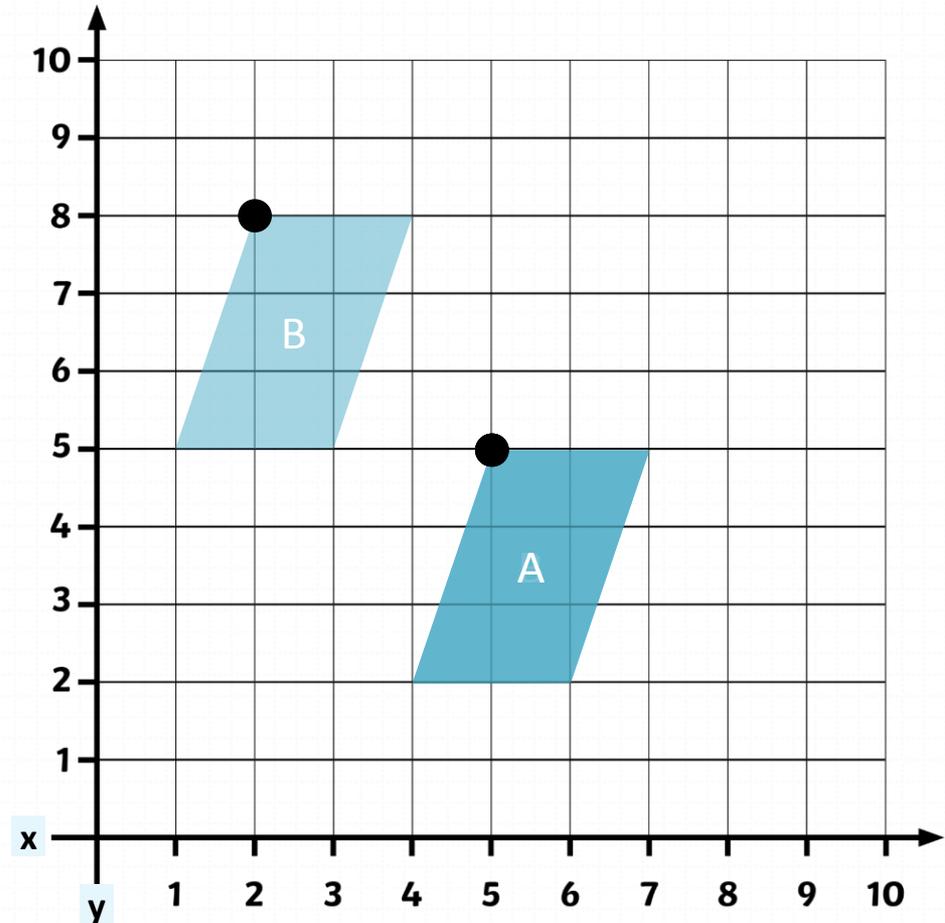
Activity 1: Describe the translations
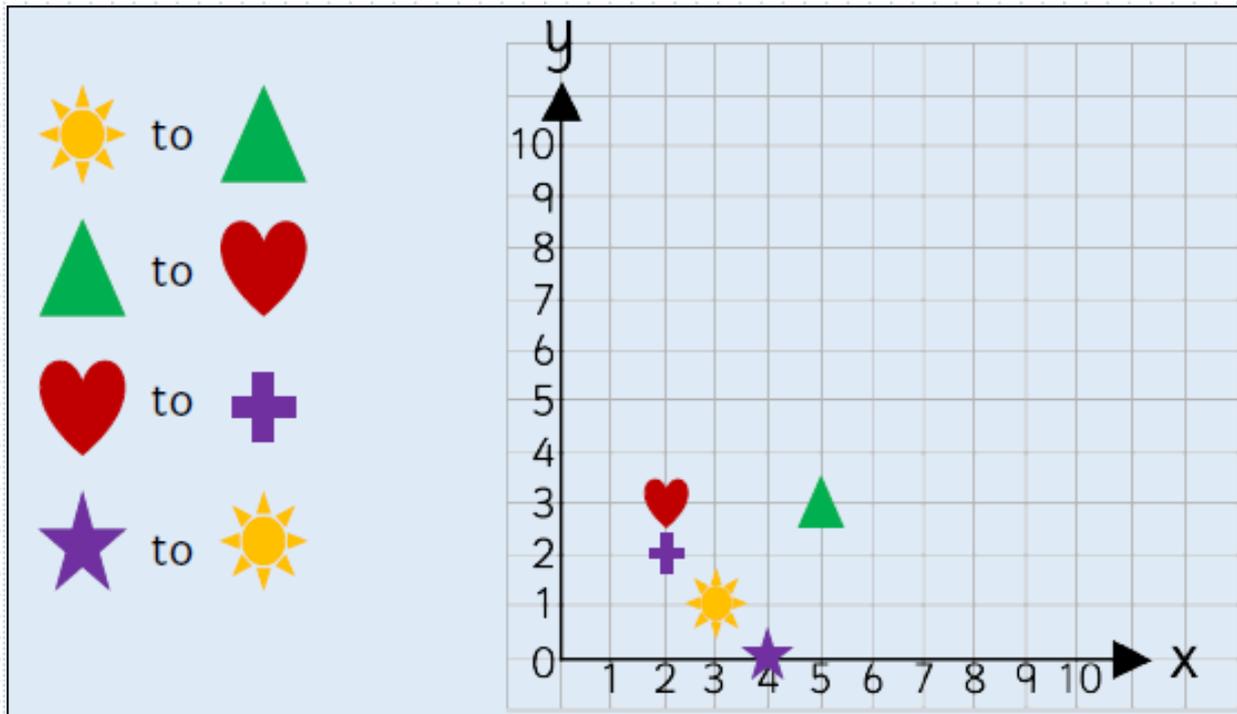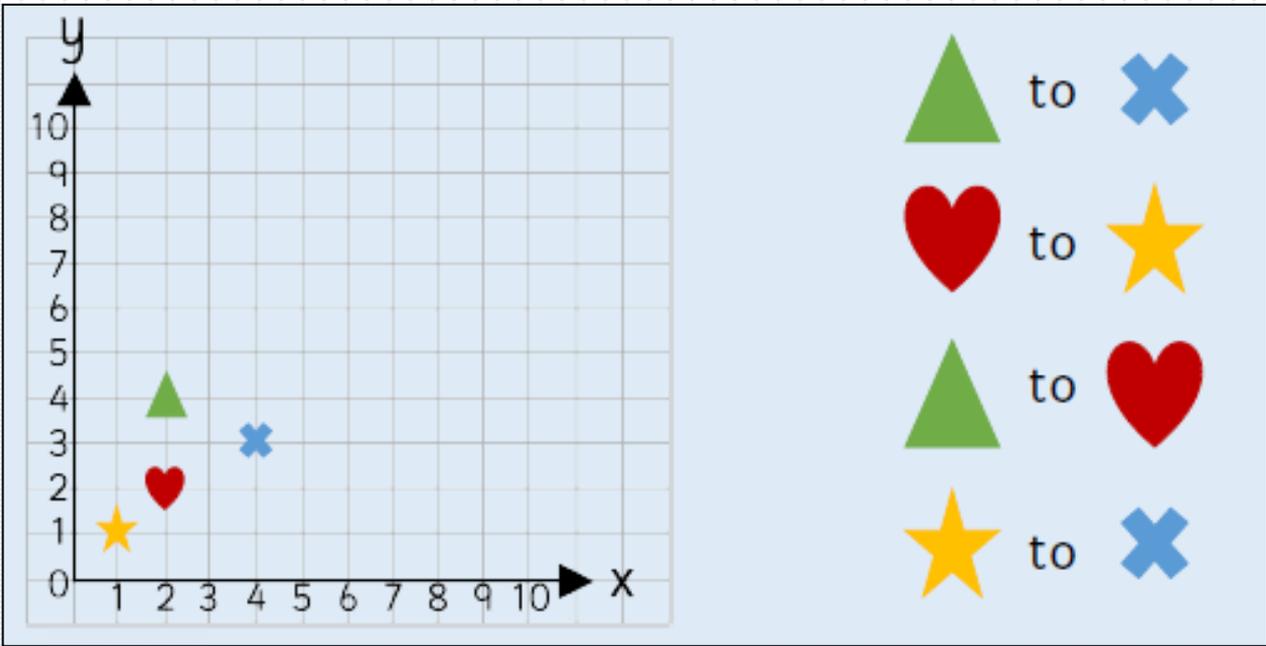
Activity 2:
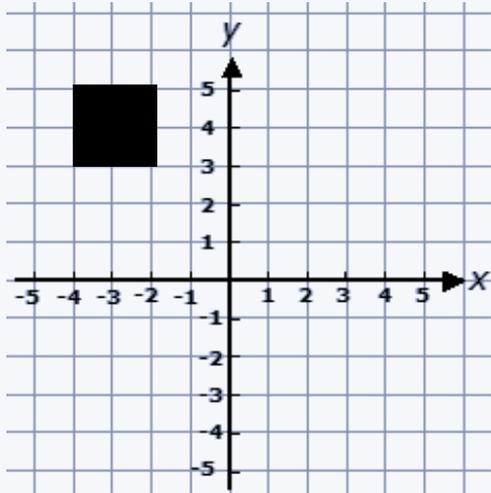
Translate the shape 7 squares right and 6 squares down.
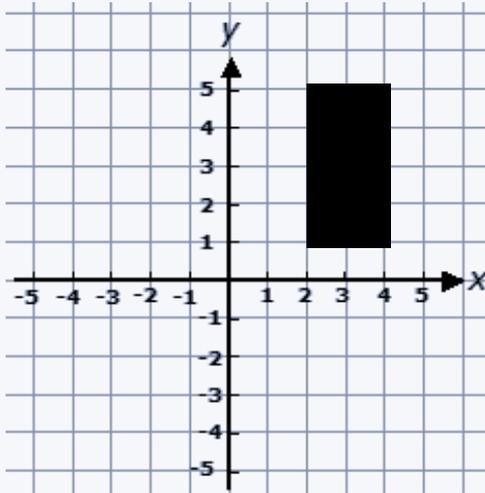
Translate the shape 5 squares left and 4 squares down.
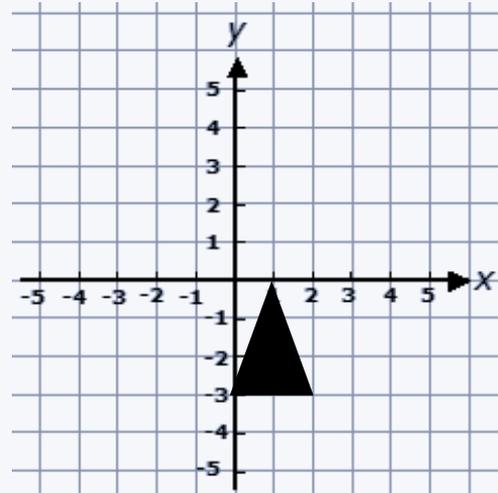
Translate the shape 2 squares right and 4 squares up.

For the following, write the translation of the blue shape to the red shape
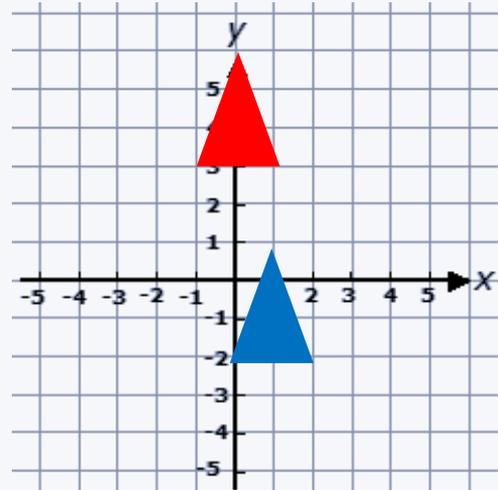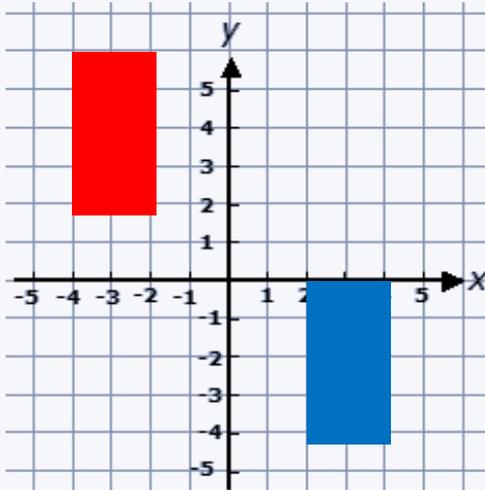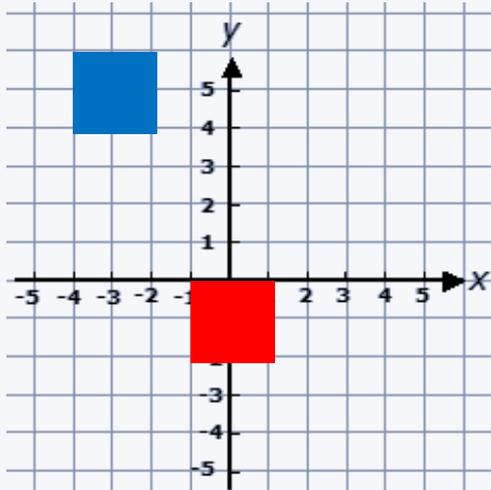
Extension activity:

Create 3 translations of your own. Draw your own shape, translate it and write down the translation, using right, left, up or down.
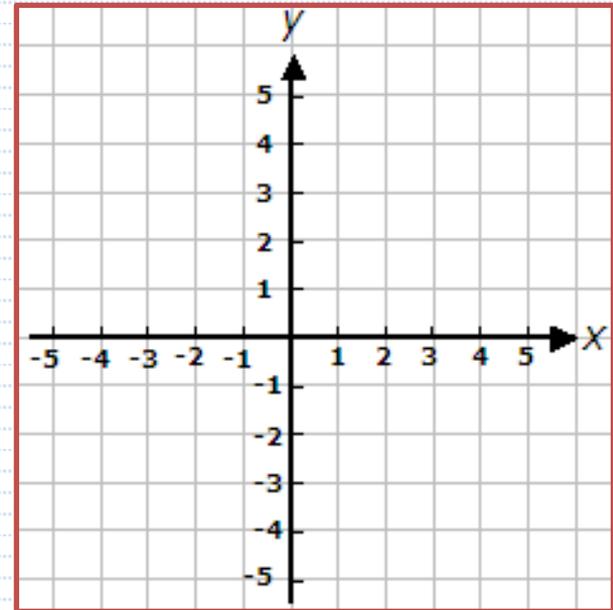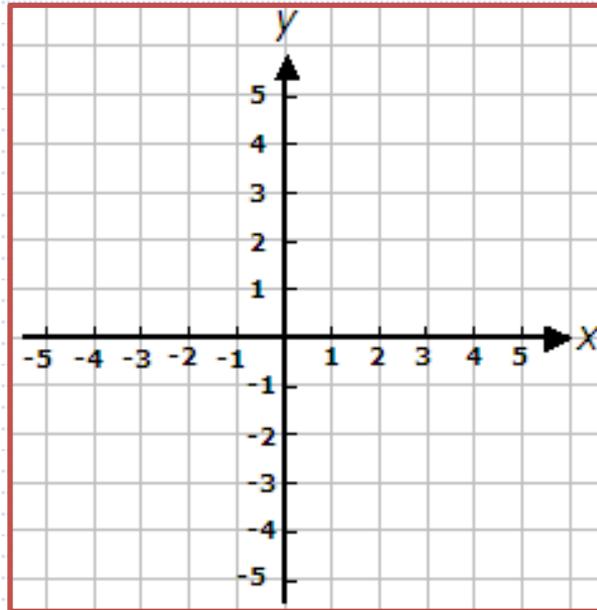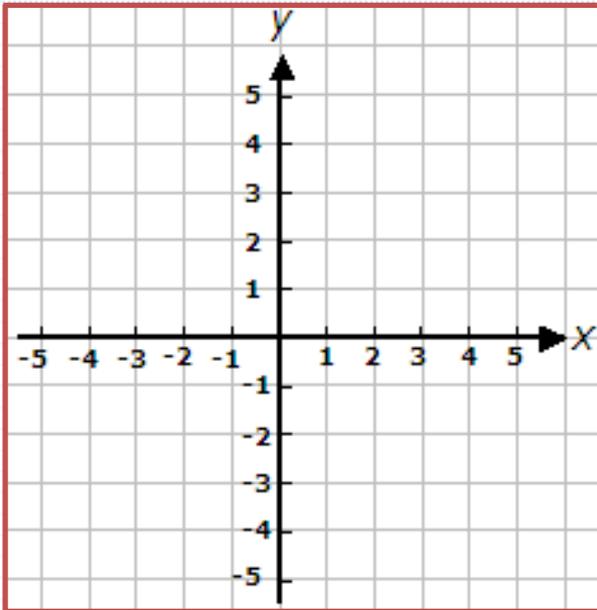
Lesson 5

To answer mental maths questions.

Activity 1 - Complete the coordinates and translation home learning activity on Professor Assessor.

Activity 2 - Have a go at the mental maths questions on the following slide.

Activity 2 - Have a go at the following mental maths questions

1. 9 X 9 =
2. 64 divided by 8 =
3. 132 – 29 =
4. 288 + 49 =
5. (80-40) – 19 =
6. Share 63 sweets equally between 9 children. How many would they each have?
7. Round 656 to the nearest 100
8. How many seconds are there in 2 minutes?
9. How many days are there in September and October altogether?
10. How many grams are there in two bags of sugar, each weighing 2kg?
11. How many millilitres are there in 3 litres of squash?
12. What are the two missing numbers from this sequence? 12, 6, 0, _, _
13. What type of triangle has no equal sides and no equal angles?
14. I have 6 faces, 8 corners and 12 edges. Not all my sides are the same length. What shape am I?
15. There are 2 pizzas. Would you rather have 2/16 or 1/8? Explain your answer
16. On a good day, with the wind behind her, Mrs Smith can jump 220 cm, Miss McMillan can jump 2.1 metres. Who can jump the furthest and by how much?
17. Miss Shaw has a square paddock to exercise her horses, if one side measures 8m. What is the perimeter and area of the paddock?
18. Mrs Harvey needs 6 apples to bake an apple pie, how many apples will she need to make 12 pies?
She is feeling generous, she gives ¾ of her 12 pies to her colleagues and eats 2 herself, how many does she have left?
19. What is the difference between the highest temperature of 28°c recorded in July and the lowest recorded in January which was -4°c?
20. In a recent survey, 80% of 150 Bratton School children said they preferred baked beans to peas. What number of children preferred peas?
21. I put my cake in the oven at 13.05, the recipe said to cook for 45 minutes. What time did I have to take the cake out?
22. If a car takes 60 seconds to do one lap at Silverstone. How many laps can it do in one hour?

Lesson 5 questions - answers

1. 9 X 9 = 81
2. 64 ÷ 8 = 8
3. 132 − 29 = 103
4. 288 + 49 = 337
5. (80-40) − 19 = 21
6. Share 63 sweets equally between 9 children = 7
7. Round 656 to the nearest 100 = 700
8. How many seconds are there in 2 minutes? = 120
9. How many days are there in September and October altogether? = 61
10. How many grams are there in two bags of sugar, each weighing 2kg? = 4000 g
11. How many millilitres are there in 3 litres of squash? = 3000 ml
12. What are the two missing numbers from this sequence? 12, 6, 0, -6, -12
13. What type of triangle has no equal sides and no equal angles? a scalene
14. I have 6 faces, 8 corners and 12 edges. Not all my sides are the same length. What shape am I? a cuboid
15. There are 2 pizzas. Would you rather have 2/16 or 1/8? Explain your answer. They are equal.
16. On a good day, with the wind behind her, Mrs Smith can jump 220 cm. Miss McMillan can jump 2.1 metres. Who can jump the furthest and by how much?   Mrs Smith, by 10 cm
17. Miss Shaw's has a square paddock to exercise her horses. If one side measures 8m. What is the perimeter and area of the paddock? Perimeter = 32m Area = 64m
18. Mrs Harvey needs 6 apples to bake an apple pie. How many apples does she need to make 12 pies? = 72
    As she is feeling generous, she gives ¾ of the 12 pies to her colleagues and eats 2 herself. How many does she have left? = 1
19. What is the difference between the highest temperature of 28°c recorded in July and the lowest recorded in January which was - 4°c? = 32°
20. In a recent survey, 80% of 150 Bratton School children said they preferred baked beans to peas. What number of children preferred peas? = 30
21. I put my cake in the oven at 13.05, the recipe said to cook it for 45 minutes. What time did I have to take the cake out? = 13.50
22. If a car takes 60 seconds to do one lap at Silverstone, how many laps can it do in one hour? = 60