

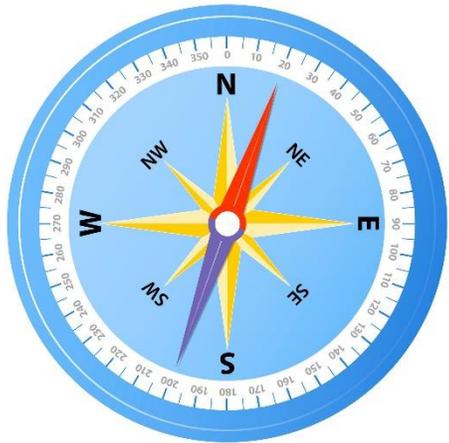
## Maths. Position and direction. Week beginning 29<sup>th</sup> June 2020

This week we are going to be thinking about describing the position of something and also directions.

Key vocabulary for this week:

Position, direction, co-ordinates, left, right, forwards, backwards, anti-clockwise, clockwise, turn

**Remember, when we read co-ordinates, we always go along the bottom and then up the side (Along the corridor and up the stairs)**



A compass has four main points

North - Never

East - Eat

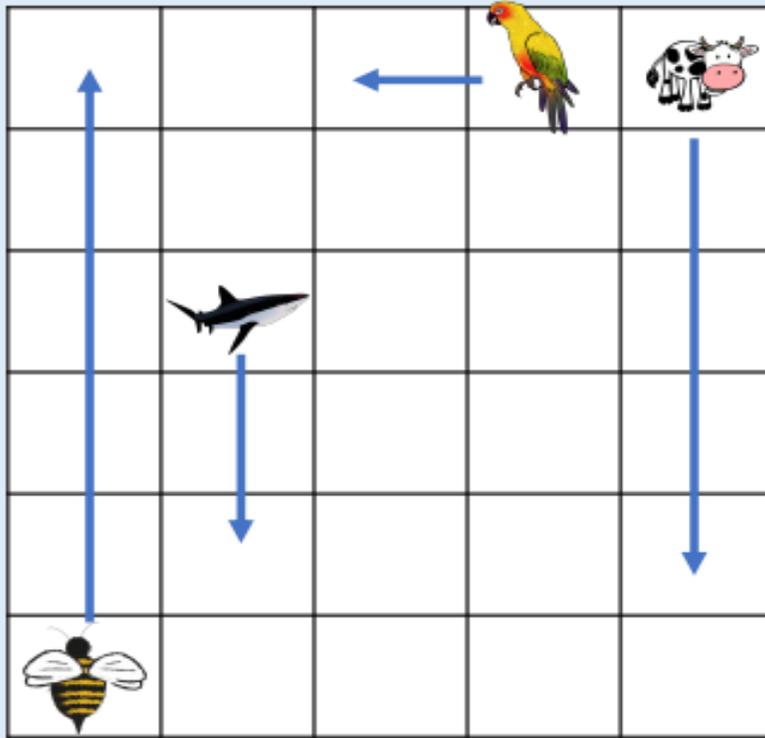
South - Shredded

West - Wheat

Session One  
Activity One

Describing  
movements

Complete the stem sentences to describe the  
movements made.



The  has moved 1 square \_\_\_\_\_.

The  has moved \_\_\_\_\_ squares \_\_\_\_\_.

The \_\_\_\_\_ has moved 2 squares right.

The \_\_\_\_\_ has moved \_\_\_\_\_ squares forwards.

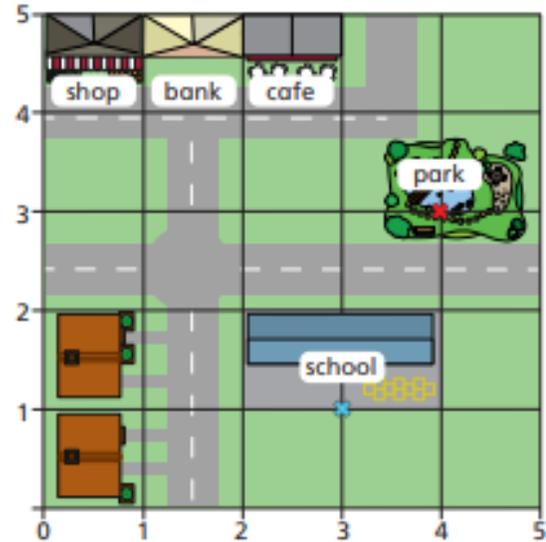
# Session One

## Activity Two

Use maps to describe the position of different places on a map

### Describe position

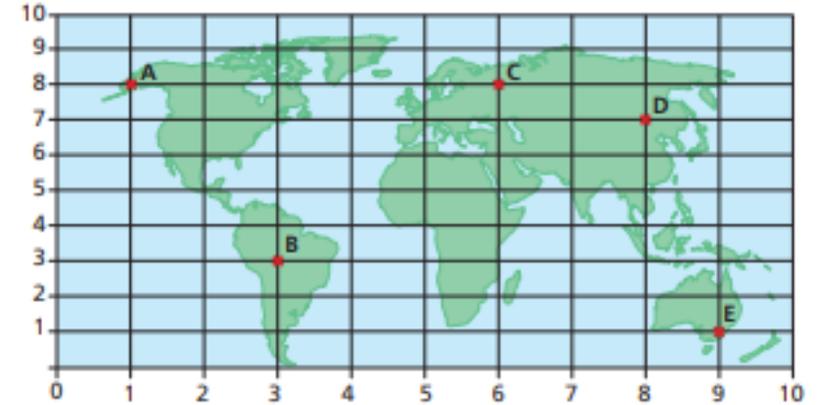
1 Here is a map of part of a town.



- a) Which place is next to the shop? \_\_\_\_\_
- b) Which place is next to the bank and close to the park? \_\_\_\_\_
- c) The front gates of the school have been marked with a cross.  
Write the coordinates of the school gates. (  ,  )
- d) The slide in the park has been marked with a cross.  
Write the coordinates of the slide. (  ,  )

Compare answers with a partner.

2 A map of the world is drawn on a grid. Some locations are marked at points A to E.



- a) Which point is at the bottom right of the grid?  
\_\_\_\_\_
- b) Which two points are to the left of point C on the map?  
\_\_\_\_\_ and \_\_\_\_\_
- c) Write the coordinates of each location.  
A (  ,  )      D (  ,  )  
B (  ,  )      E (  ,  )  
C (  ,  )

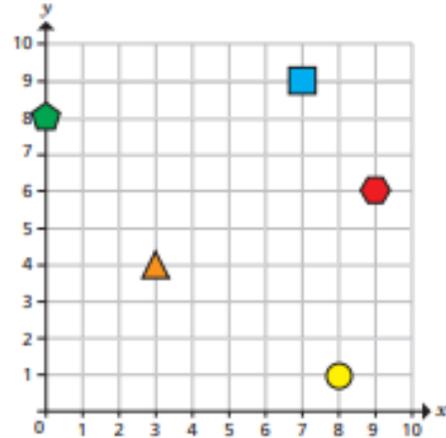


# Session One

## Activity Three

Remember, when we read co-ordinates, we always go along the bottom and then up the side (Along the corridor and up the stairs)

3 Some shapes are drawn on a grid.



a) Tommy, Dora and Eva are working out the coordinates of the pentagon.

Dora: The coordinates of the pentagon are (0, 8).

Tommy: The coordinates of the pentagon are (8, 0).

Eva: I think you are both right!

Who is correct? \_\_\_\_\_

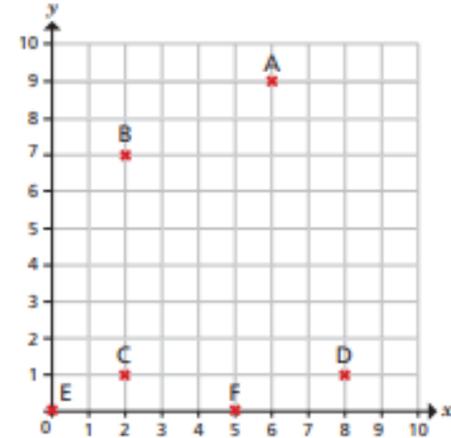
Talk about it with a partner.

b) Write the coordinates of the other shapes.

square (  ,  )      triangle (  ,  )  
 circle (  ,  )      hexagon (  ,  )



4 Six points are drawn on a grid.



a) Write the coordinates of each point.

A (  ,  )      C (  ,  )      E (  ,  )  
 B (  ,  )      D (  ,  )      F (  ,  )

b) Teddy and Alex each choose a point.

Teddy: Our x coordinates are the same.

Alex: My y coordinate is greater than Teddy's.

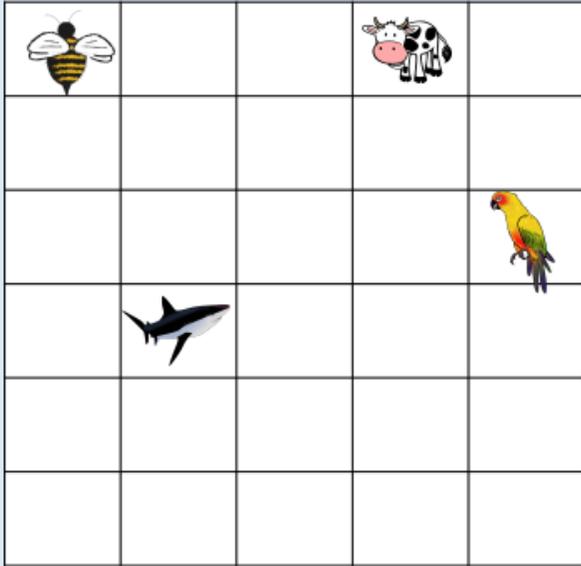
What points have Alex and Teddy chosen?

Alex (  ,  )      Teddy (  ,  )



## Session Two Activity One

Record these movements on the grid using arrows.



The  moves 1 square forward.

The  moves 3 squares left.

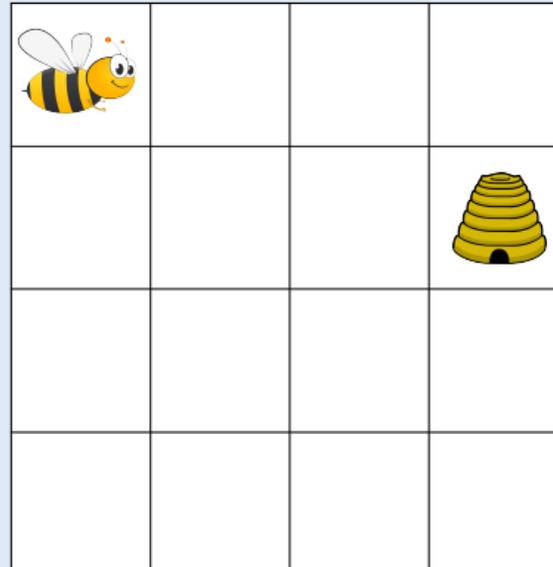
The  moves 2 squares right.

The  moves 4 squares backwards.

## Challenge for Activity One

### Reasoning 2

### Describing Movement



How many different routes can you plot for the bee to get to the hive?

Use the words forwards, backwards, left and right.

# Session Two

## Activity Two

### Draw on a grid

1 The cards show the coordinates of six points.

A (4, 4)

B (2, 3)

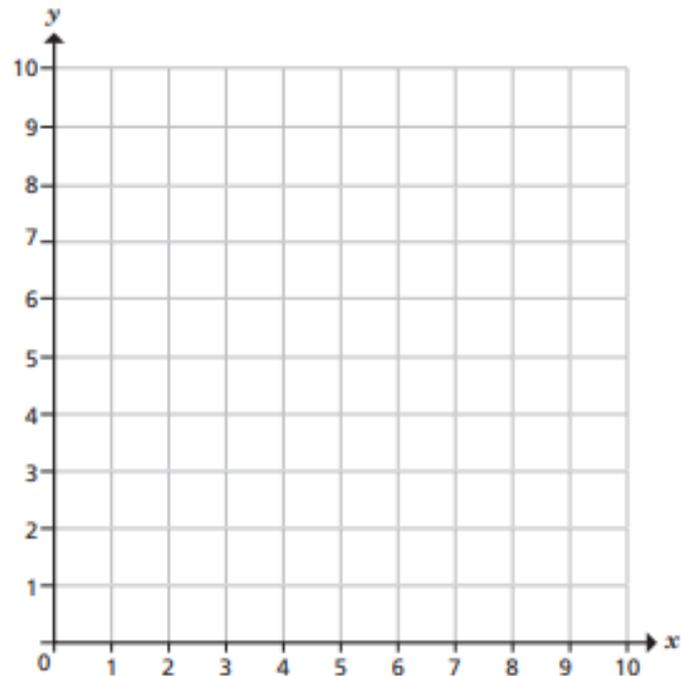
C (6, 4)

D (10, 8)

E (0, 5)

F (9, 0)

Plot and label the points on the grid.



Compare answers with a partner.

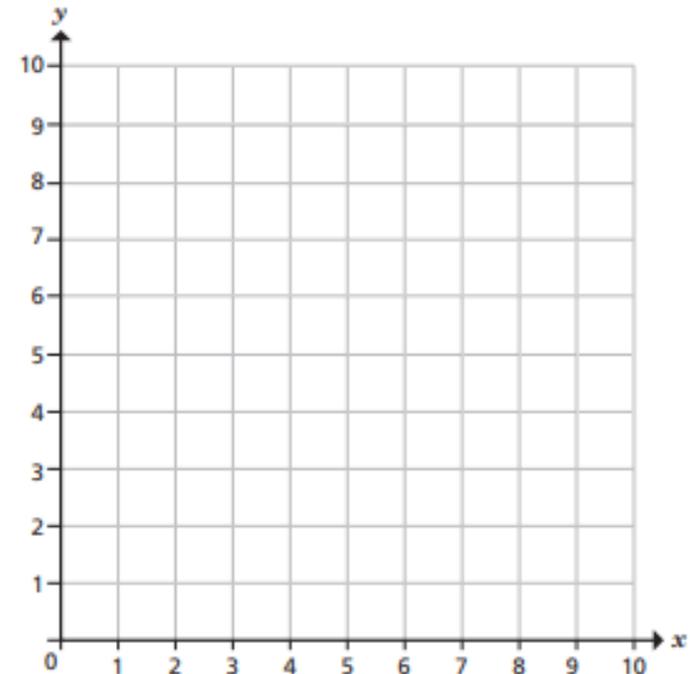
2 Here are the coordinates of three points.

X (1, 3)

Y (2, 5)

Z (3, 7)

a) Plot and label the points on the grid.



b) Join up the points.

What do you notice?

c) Write the coordinates of two other points that fit this pattern.

(, ) and (, )

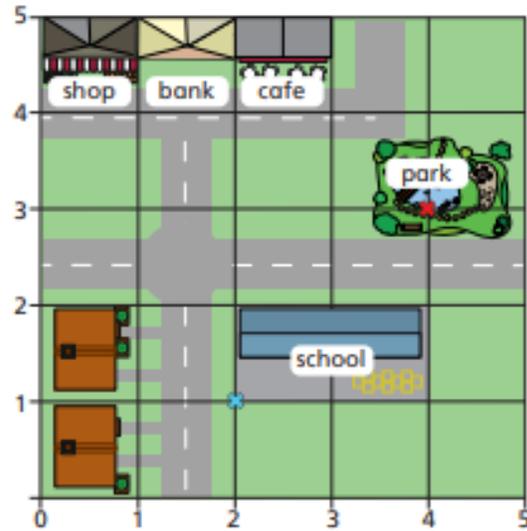
Compare answers with a partner.

# Session Two

## Activity Three

### Move on a grid

1 Here is a map of part of a town.



a) Annie is at the park at the coordinate (4, 3).

She moves 3 squares to the left.

Draw on the grid to show where Annie is now.

What are the coordinates of this point? (  ,  )

b) Mo is at school at the coordinate (2, 1).

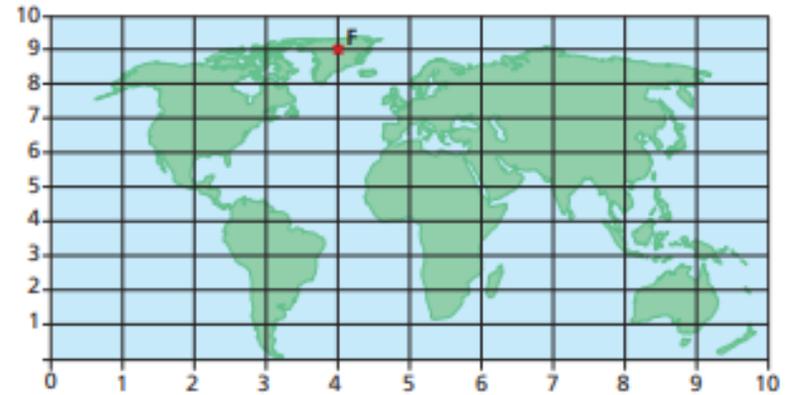
He walks 2 squares up.

Draw on the grid to show where Mo is now.

What are the coordinates of this point? (  ,  )



2 A map of the world is shown on a grid.



a) A plane is at point F.

What are the coordinates of this point? (  ,  )

b) The plane takes off from point F and travels 2 right and 5 down.

Mark its new position on the grid and label this as point G.

What are the coordinates of point G? (  ,  )

c) The plane now takes off from point G and travels 4 left and 2 up.

Mark its new position and label this point H.

What are the coordinates of point H? (  ,  )



# Session Three

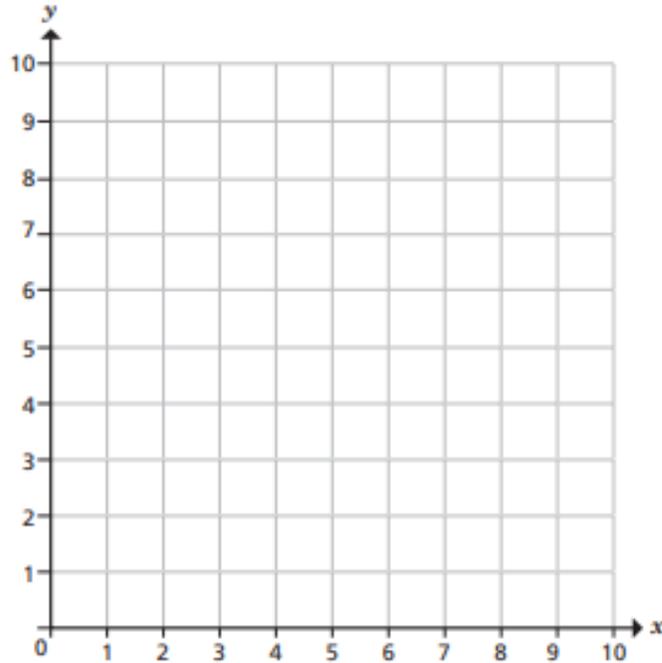
## Activity One

### Draw on a grid

1 The cards show the coordinates of six points.

A (4, 4)	B (2, 3)	C (6, 4)
D (10, 8)	E (0, 5)	F (9, 0)

Plot and label the points on the grid.



Compare answers with a partner.

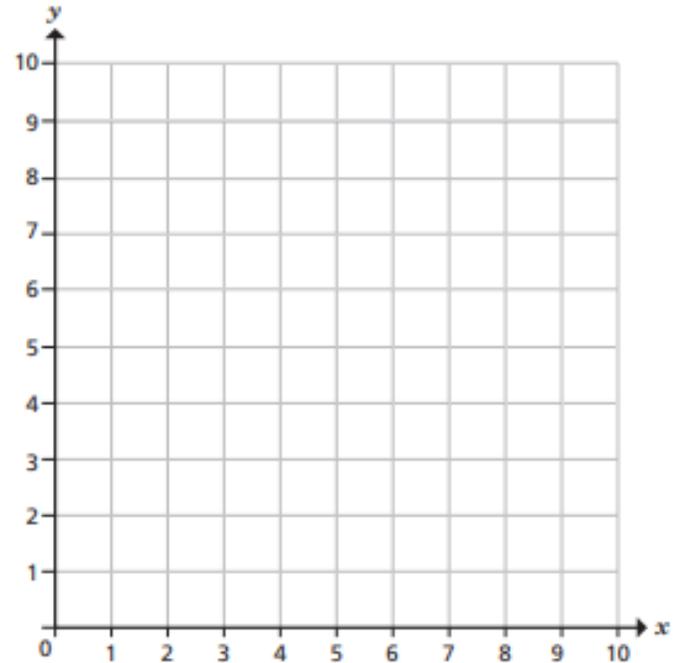
2 Here are the coordinates of three points.

X (1, 3)

Y (2, 5)

Z (3, 7)

a) Plot and label the points on the grid.



b) Join up the points.

What do you notice?

c) Write the coordinates of two other points that fit this pattern.

(, ) and (, )

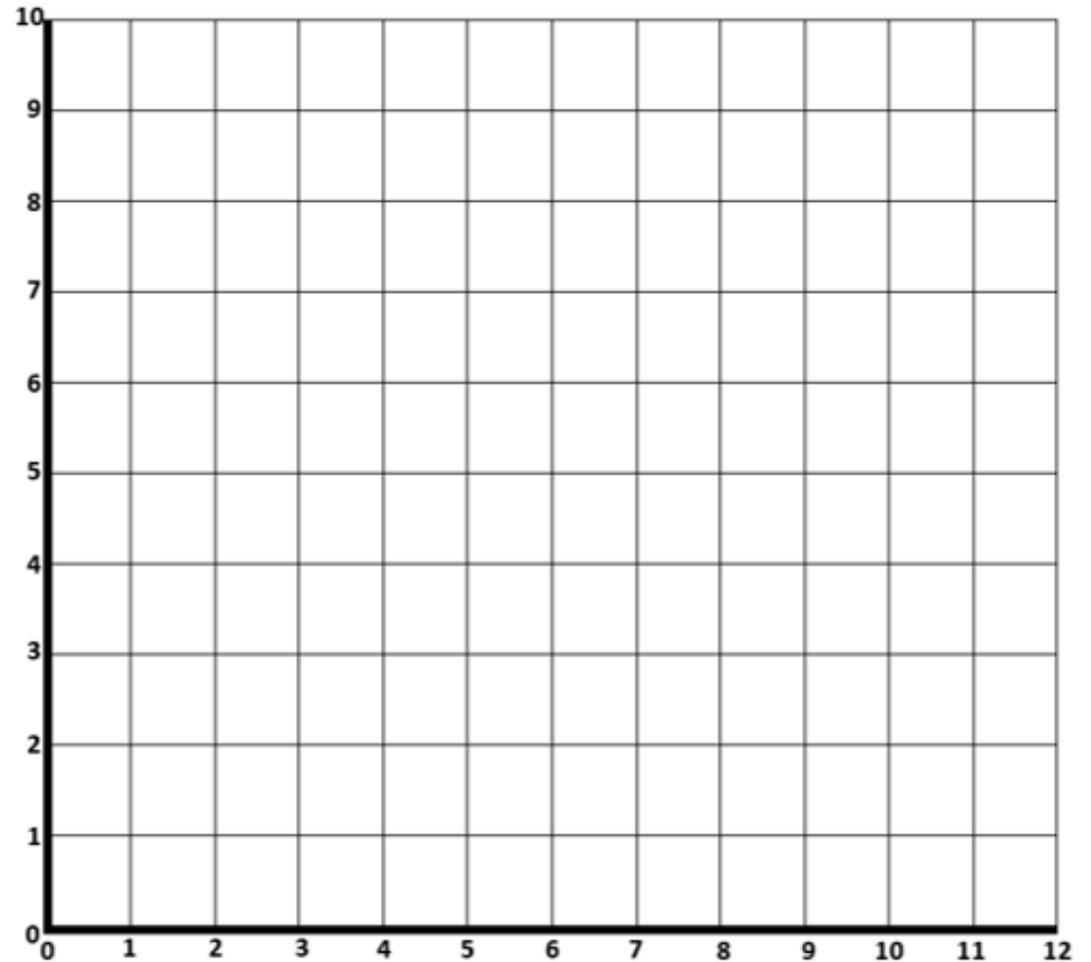
Compare answers with a partner.

**Session Three**  
**Activity Two**

Plot the following  
points on your grid...

$(4,1)$   $(6,1)$   $(6,3)$

Which point is missing  
if I want to make a  
square?



Session Three  
Activity Three

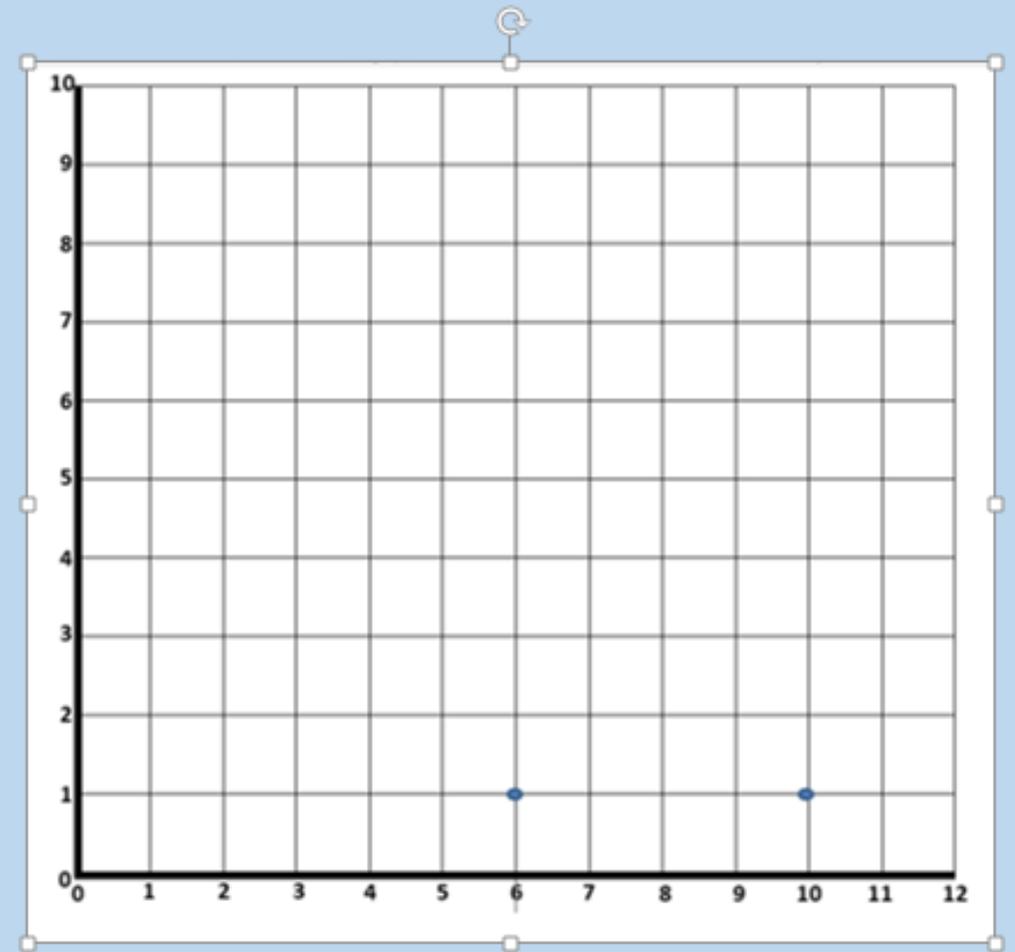
How can I make a triangle?

We have only been given two points to make a triangle . . .

How can we work out the missing coordinate?

Plot the point on your grid and work it out! (There is more than one possibility.)

(6,1) (10,1)



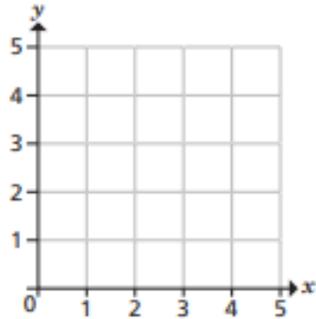
# Session Three

## Activity Four

3 Here are the coordinates of the vertices of a rectangle.

(1, 1) (5, 1) (1, 3) (5, 3)

Draw the rectangle on the grid.



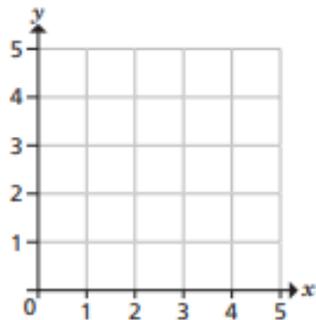
4 Two squares are drawn on a grid.

Here are the coordinates of the vertices of each square.

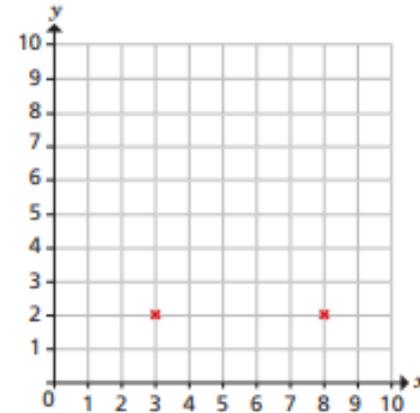
Square A (1, 1) (1, 3) (3, 3) (3, 1)

Square B (2, 2) (2, 4) (4, 4) (4, 2)

- a) Do you think the squares will overlap? \_\_\_\_\_
- b) Draw on the grid to check your answer.



5 Two vertices of a triangle are shown on the grid.



- a) What are the coordinates of the two vertices shown?  
 (  ,  ) and (  ,  )
- b) Give a possible coordinate for the third vertex, if the triangle is right-angled.  
 (  ,  )
- c) Give a possible coordinate for the third vertex, if the triangle is isosceles.  
 (  ,  )

Compare answers with a partner.

6 The coordinates of one vertex of a square are (10, 10).

Give possible coordinates for the other three vertices.

(  ,  ) (  ,  ) (  ,  )

How many different answers can you find?

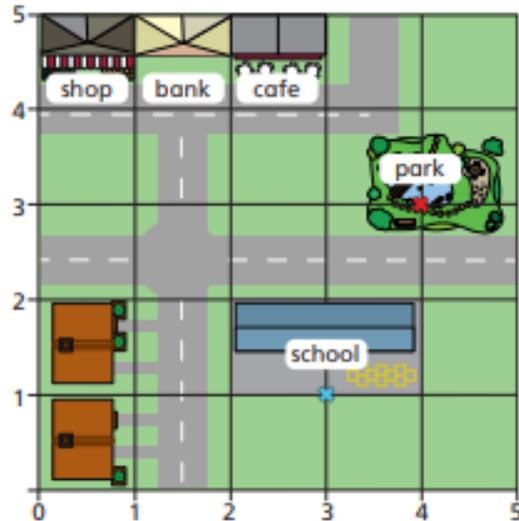


# Session Four

## Activity One

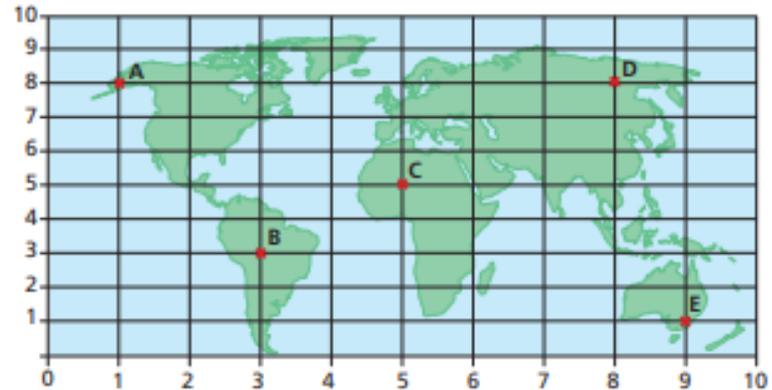
### Describe a movement on a grid

1 Here is a map of part of a town.



- a) Ron is standing at (1, 1).  
He walks to the school gates at point (3, 1).  
Complete the sentence to describe his journey.  
Ron walks  to the right.
- b) Rosie is standing at (4, 0).  
She walks to the slide in the park at point (4, 3).  
Complete the sentence to describe her journey.  
Rosie walks  up.
- c) Annie is at (5, 5) and wants to walk to the slide in the park.  
What route could she take to get there?

2 A map of the world is shown on a grid.



Complete the sentences to describe the movement of planes.

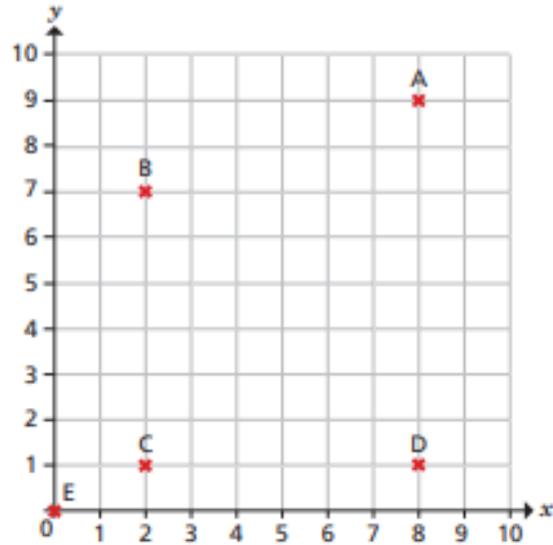
- a) Plane 1 flies from A to D.  
Plane 1 flies  right.
- b) Plane 2 flies from A to B.  
Plane 2 flies  right and  down.
- c) Plane 3 flies from C to D.  
Plane 3 flies  right and  up.
- d) Plane 4 flies from E to D.  
Plane 4 flies  left and  up.



# Session Four

## Activity Two

3 Five points are drawn on a grid.

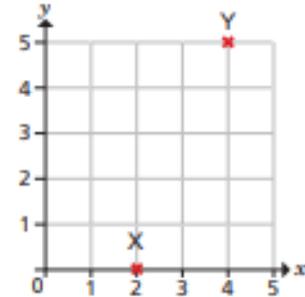


Complete the sentences to describe the translations.

- a) C to D is a translation  right.
- b) A to D is a translation  down.
- c) E to C is a translation  right and  up.
- d) C to A is a translation  \_\_\_\_\_ and  \_\_\_\_\_
- e) A to B is a translation  \_\_\_\_\_ and  \_\_\_\_\_

How many other translations can you describe from the grid?

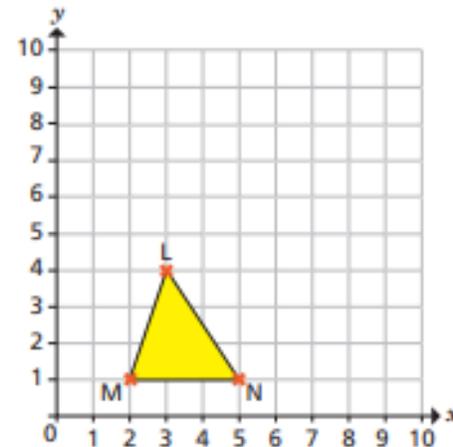
4 Two points, X and Y, are shown on the grid.



- a) Describe the translation from X to Y.  
\_\_\_\_\_
- b) Describe the translation from Y to X.  
\_\_\_\_\_

What do you notice? Does this always happen?

5 A triangle is drawn on the grid.



It is translated so that the vertex M moves to (7, 4).

- a) Describe the translation.  
\_\_\_\_\_
- b) Draw the translated triangle on the grid to show its new position. Create your own problem like this for a partner.



# Fun Extension activity

## Find the objects - coordinates game

SparkleBox © Copyright 2008, SparkleBox Teacher Resources (SparkleBox KS2 - www.sparklebox2.co.uk)

### Setting the game up

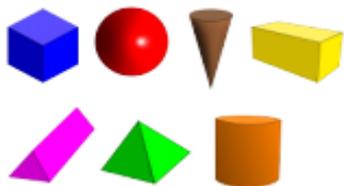
Make sure you and your partner have boards with the same game number.

Shuffle the coordinates cards and place face-down in a pile on the table.

### How to play

With your partner, take it in turns to pick up and turn over a coordinates card. Read out the coordinates on the card and mark a cross on those squares on your grid.

The winner is the first player to mark a cross on one of each shape on their board:



### Free turns

If you mark a square that says 'Free Turn' you can have an extra go straight away. Only one 'Free Turn' can be taken per coordinate card.

Game Number:

1

11	FREE TURN!													
10			FREE TURN!		FREE TURN!			FREE TURN!			FREE TURN!			
9														
8														
7	FREE TURN!													
6						FREE TURN!	FREE TURN!				FREE TURN!			FREE TURN!
5		FREE TURN!			FREE TURN!								FREE TURN!	
4														
3														
2											FREE TURN!			
1		FREE TURN!												
	A	B	C	D	E	F	G	H	I	J	K	L	M	N

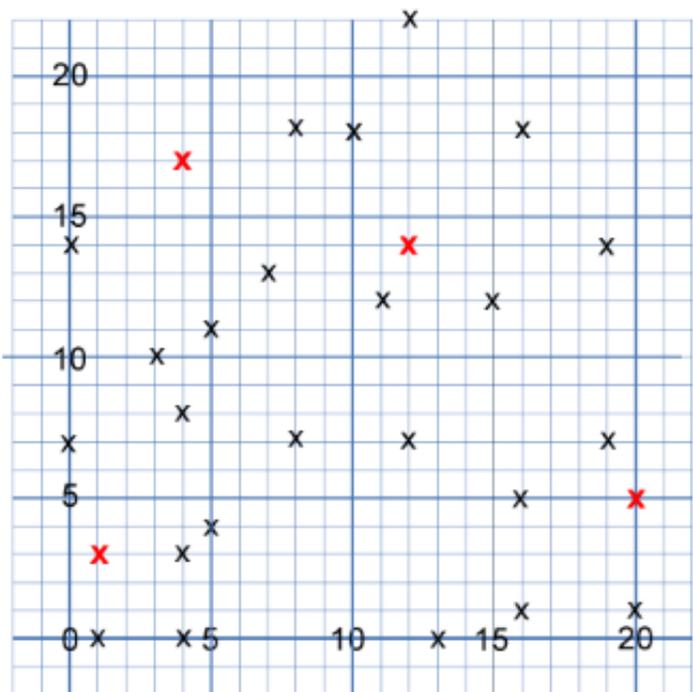


**Challenge Task**  
**(For those**  
**who want**  
**extra**  
**challenge**  
**activities)**

## Eight Hidden Squares

Age 7 to 14 ★★

On the graph below there are 28 marked points.



These points all mark the vertices (corners) of eight hidden squares.  
Each of the 4 red points is a vertex shared by two squares.  
The other 24 points are each a vertex of just one square.  
All of the squares share just one vertex with another square.  
All the squares are different sizes.  
There are no marked points on the sides of any square, only at the vertices.

Can you find the eight hidden squares?

**Challenge Task (For those who want extra challenge activities)**

# A Cartesian Puzzle

Age 7 to 11

Here are the coordinates of some quadrilaterals, but in each case one coordinate is missing! The coordinates are given going round each quadrilateral in an anti-clockwise direction.

1.  $(2,11), (0,9), (2,7), (?,?)$
2.  $(3,7), (3,4), (8,4), (?,?)$
3.  $(18,3), (16,5), (12,5), (?,?)$
4.  $(13,12), (15,14), (12,17), (?,?)$
5.  $(7,14), (6,11), (7,8), (?,?)$
6.  $(15,9), (19,9), (16,11), (?,?)$
7.  $(11,3), (15,2), (16,6), (?,?)$
8.  $(9,16), (2,9), (9,2), (?,?)$

The quadrilaterals are all symmetrical. This may be rotational or line symmetry or both. Can you work out what the missing coordinates are if you know they are all positive? Is there more than one way to find out?

Now plot those eight missing coordinates on a graph like this. What shape do they make and what sort of symmetry does it have?

