Graphs

Summer Term

Graphs

Topics

- Coordinates
- Straight line graphs
- Gradients
- Intercepts

What do I need to be able to do?

- Name and plot coordinates
- Recognise and sketch horizontal and vertical graphs
- Complete tables of values
- Plot straight line graphs
- Identify gradients/intercepts

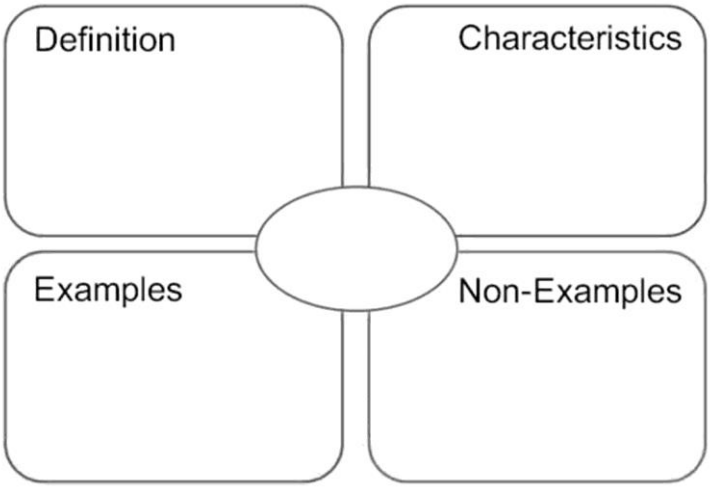
Key Vocabulary

Axis	A fixed reference line a grid to help show the position of coordinates
Gradient	How steep a graph is at any point
Y intercept	Where the graph cuts through the y axis
Coordinate	A set of values that show an exact position
Quadrant	Any of the 4 areas made when we divide up a plane by an x and y axis
Vertical	In an up and down position. The y axis is the vertical axis
Horizontal	Going side to side. The x axis is the horizontal axis
Graph	A diagram showing the relationship between two quantities

Career Links

Being able to confidently work with graphs is a great skill to have and has lots of links with a number of careers such as:

- Analysts
- Economists
- Operations researchers
- Finance
- Marketing



Calculating the gradient from two points

Calculate the gradient of a line that passes through the points (4,10) and (-3,-11).

Use the formula $\frac{y_2-y_1}{x_2-x_1}$ or $\frac{Change\ in\ y}{Change\ in\ x}$

1) Label your coordinates.
(4,10) and (-3,-11).
x_1, y_1 x_2, y_2
2) Substitute into the formula or your choice.
$\frac{-11-10}{-3-4}$
3) Simplify the fraction.
$\frac{-21}{-7} = 3$

So the gradient of the line joining these two points is **3**.

Finding the equation of a line from two points

Find the equation of the line passing through the points (3,1) and (-2,-9).

1) Find the gradient, using the formula. $\frac{y_2-y_1}{x_2-x_1} = \frac{-9-1}{-2-3} = \frac{-10}{-5} = 2$

2) Write out the equation replacing *m* with the found gradient. $y = 2x + c$

3) Substitute in one pair of coordinates and rearrange to calculate the value of c. $1 = (2 \times 3) + c$, $1 = 6 + c$, $-5 = c$

3) Re-write your equation in the form $y = mx + c$ with your calculated values of m and c. $y = 2x - 5$

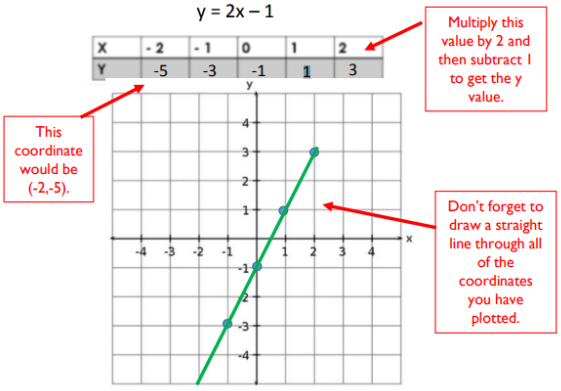
Linear graphs are straight line graphs. We substitute the x value into the equation to get the y value. Once we have both we can then plot the coordinates and draw the graph.

Draw the graph of y = 2x – 1.

To do this we multiply the x value by 2 and then subtract 1 to get the y value.

y = 2x – 1

X	-2	-1	0	1	2
Y	-5	-3	-1	1	3



Notice this graph has a gradient of 2 (the y values go up by 2 each time) and a y-intercept of -1 (the graph cuts through the y axis at -1).

GRAPHS

Summer Term

Graphs 2

Topics

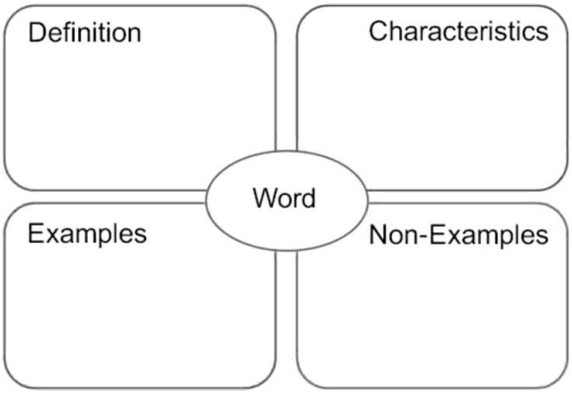
- Exchange rates
- Conversion graphs
- Real life graphs

What do I need to be able to do?

- Be able to find the midpoint of a line
- Be able to plot a straight line from a table of vales
- Be able to find the equations of a line from a graph
- Be able to recognise parallel lines

Key Terms:

- Journey
- Distance
- Horizontal
- Vertical
- Axis
- Conversion
- Starting point
- Gradient
- Constant
- Speed
- Represents



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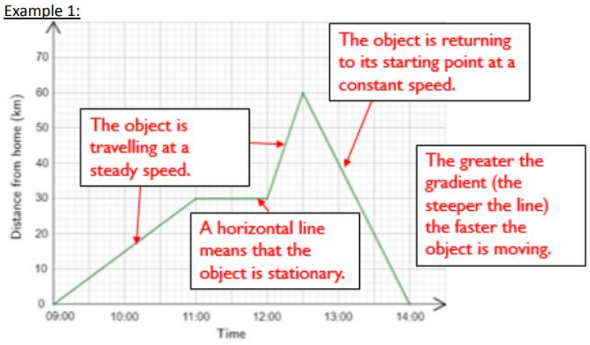
The area under a speed-time graph represents the distance travelled. Likewise, the area under a velocity-time graph represents the **displacement** of the moving object. If the velocity is always positive, then the displacement will be the same as the distance.

Conversion graph: A graph which converts between two variables.
Distance-time graph: A graph that shows a journey and the relationship between the distance reached in a given time.
Real - life graph: This is a graph that represents a situation that we would see in real life.

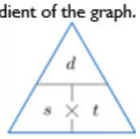
Example 1:



The speed of an object can be calculated from the gradient of the graph.

E.g. calculate the speed at which the object travelled between 9am and 11am.

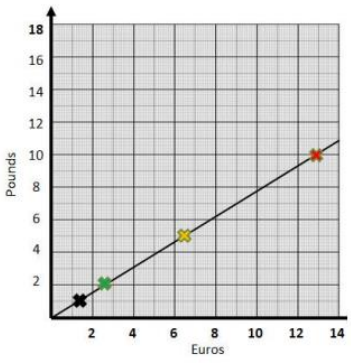
Speed = 30 ÷ 2
= 15 km/hr

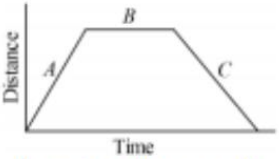


Drawing a conversion graph

You can plot known conversions on a graph to help you to convert other unknown amounts.

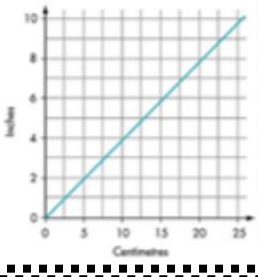
Current exchange rate
£1 = € 1.29
£2 = € 2.58
£5 = € 6.45
£ 10 = € 12.90





A = steady speed,
B = no movement,
C = steady speed back to start

Using a conversion graph



Conversion graphs can be used to convert between any 2 units which have a linear relationship.
Here, you can use the graph to convert between inches and centimetres

Year 9H – Knowledge Organiser