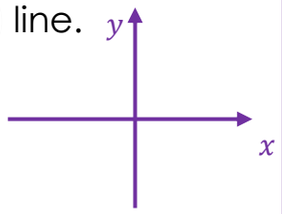
Year 8 Maths Topics 4,5&6
Graphs, Data & Probability

Week 1

In this topic we are going to learn about drawing graphs. The grid we plot them on is called the **Cartesian Plane**. We will start by plotting points in all 4 quadrants. The **x-axis** is the horizontal (sideways) line and the **y-axis** is the vertical (up/down) line.



In a **co-ordinate**, the 1st number is the x co-ordinate, and the 2nd number is the y co-ordinate, (x,y).

When plotting a point, you always start at (0,0) which is known as the **origin**. You move sideways first then up or down. We can remember it by saying "**go along the corridor and up/down the stairs**"

We will look at joining points up to make a straight line **parallel** to the axis and naming the line with an equation.

Week 2

To draw a line from an equation we will use a table of values. You can use a function machine to help you work out the values.

E.g. $y = 3x$ $\quad x \rightarrow$ x3 $\rightarrow y$

x	-2	-1	0	1	2
y	**-6**	**-3**	**0**	**3**	**6**

Then plot a pair of x and y values as a co-ordinate.

We will discover that the number in front of the x affects the **gradient** of the line. The gradient is how steep the line is.

We will also plot lines of the form $y = x \pm c$ where c is a number and discover that the number affects where the intercept on the y-axis is. The **intercept** is where is crosses the y-axis.

Week 3

This week we will put all what we have learned so far together to plot graphs of the form $y = mx + c$.

E.g. $y = 3x + 2$ $\quad x \rightarrow$ x3 $\rightarrow$ +2 $\rightarrow y$

x	-2	-1	0	1	2
y	**-4**	**-1**	**2**	**5**	**8**

This is a **linear** graph as it makes a straight line. We will link this to direct proportion graphs from last term.

Higher learners will also go on to explore **non-linear** graphs and discover they make a curve. They will also learn to find the **midpoint** of a line segment. The midpoint is halfway along the line.

Week 4

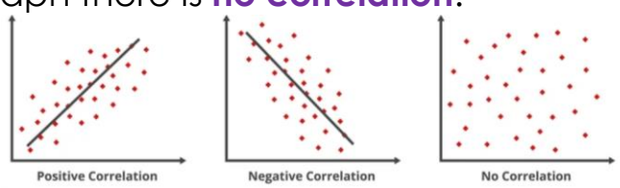
This week we will start the topic Representing Data. We will use our knowledge of how to plot points to represent some data as a **Scatter graph**.

We will learn to look for patterns in the points known as **correlation**.

If the points start low and gradually go up it is a **positive correlation**.

If the points start high and gradually go lower it has a **negative correlation**.

If the points are scattered all over the graph there is **no correlation**.



We can draw a **line of best fit** through the points to show the correlation.

Week 5

This week we will look at different types of data and representing data in a table.

Quantitative data is when the answer is numerical, telling you how many.

Qualitative data is when the answer is a quality e.g. a colour, a flavour, an item etc.

Quantitative data can be split into two further categories.

Discrete data is data that can be counted e.g. number of people, cars, animals etc.

Continuous data is data that needs to be measured e.g. time, length, weight etc.

We will put data into grouped and ungrouped tables and learn to interpret them using inequalities $<, \leq, >, \geq$. We will also look at two-way tables.

Week 6

This week we are looking at probability.

Probability is the chance of something happening or not happening.

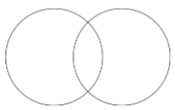
We can use words to describe the likelihood such as **impossible, unlikely, even, likely, certain.**

A **sample space** lists all the possible outcomes of an event.

S = {red, yellow, blue, green}

We can also use fractions, decimals or percentages to describe probability.

e.g. there is a $\frac{3}{8}$ chance of green on the spinner. We will also look at getting probabilities from **Venn Diagrams** and **two-way tables.**



A Venn Diagram

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Week 1

Questions	Answers
What is the name of the grid we plot the points on?	Cartesian Plane
Which axis is the horizontal axis?	$x - axis$
What do we mean by the origin?	(0,0) where the axis cross over
What word do we use to describe the point we want to plot (x,y)?	Co-ordinate
How can you remember how to plot a point?	Go along the corridor and up/down the stairs

Week 2

Questions	Answers
What do we use to generate coordinates from an equation?	A table of values (and a function machine)
What does the number in front of the x affect?	The gradient of the line
What is the gradient?	How steep the line is
What does a number added or subtracted on the end do to the line?	Changes the y intercept
What does intercept mean?	Where is crosses over the axis

Week 3

Questions	Answers
What kind of line does a line of the form $y = mx + c$ form?	A straight line.
A straight line graph is known as what kind of graph?	Linear.
What kind of line does a non-linear graph produce?	A curve.
Where on a line is the midpoint?	Halfway along the line.
What kind of graphs can linear graphs link to?	Direct Proportion graphs.

Week 4

Questions	Answers
What is the mathematical word for a pattern in the points of a scatter graph?	Correlation
How do the points look in a positive correlation?	Start low and gradually get higher (slope upwards)
What correlation is it if the points start high and gradually get lower (sloping downwards)?	Negative
When would you say there is no correlation between the points?	When there is no pattern in the points, they are random.
What can you draw to show the correlation?	A line of best fit.

Week 5

Questions	Answers
If the answer is numerical what kind of data is it?	Quantitative data
Give an example of qualitative data.	Colours or flavours
What is discrete data?	Things that can be counted e.g. people
If the data needs to be measured, what kind of data is it?	Continuous data
What are these symbols known as $< > \leq \geq$?	Inequalities

Week 6

Questions	Answers
What does probability mean?	The chance of something happening or not.
Name some words we could use to describe the probability.	Impossible, certain, likely, unlikely, even chance.
What is a list of all the possible outcomes called?	A sample space
What numerical way can we use to describe a probability?	As a fraction, decimal or percentage.
What are two overlapping circles called that contain information.	A Venn Diagram.