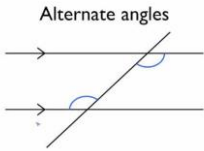
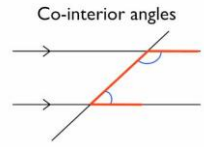
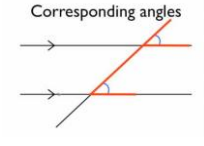





YEAR 9 FOUNDATION

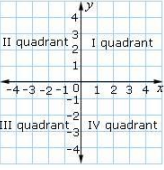
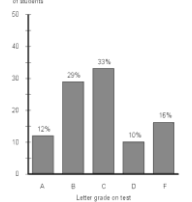
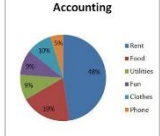

Knowledge Organisers

Year 9 Foundation Term 1



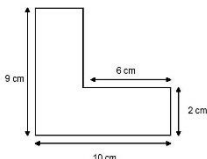
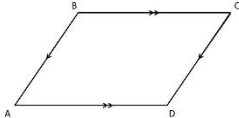
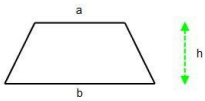
Term		Definition
1	Integer	A whole number. A positive number, a negative number or zero but not a fraction or a decimal.
2	Inequality	Solved inequalities is very similar to solving equations. Your answer will be an inequality. $<$ \leq or $>$ \geq
3	Profit	Money you gain from selling something for more than you bought it for.
4	Loss	Money you lose from selling something for less than you bought it for.
5	Debit	Money going out of your account.
6	Credit	Money coming into your account.
7	VAT	"Value added tax" is a tax that is applied to many goods you buy. It is currently at 20%.
8	Interest Rate	1) Money a bank will give you as a reward for keeping your money with them, usually paid yearly. 2) Money a bank will charge you for borrowing money from them. E.g. When you take out a mortgage for a house, you will have to pay interest on the amount you borrow.
9	Simplify	Usually this is asked when your answer can be simpler. For example, $\frac{10}{20}$ can be simplified to $\frac{1}{2}$. Or, $3x + 2x$ can be written as $5x$.
10	Estimate	This is when you roughly calculate the answer of something. In maths, you will need to round all numbers to 1 significant figure.
11	Prime number	A number that has only two factors. The first 15 prime numbers: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47.
12	Factors	Numbers we can multiply together to get another number. E.g. Factors of 6: 1, 2, 3, 6.
13	Multiples	The result of multiplying a number by an integer (whole number). E.g. The multiples of 5: 5, 10, 15, 20, 25... The multiples of 3: 3, 6, 9, 12, 15, 18, 21...
14	Common Factors	Factors of two numbers that appear in both. E.g. Factors of 6: 1, 2, 3, 6. E.g. Factors of 8: 1, 2, 4, 8. The common factors are 1 and 2 as they are factors of both numbers.
15	Common Multiples	Numbers that are common to both numbers involved. E.g. The multiples of 5: 5, 10, 15 , 20, 25... The multiples of 3: 3, 6, 9, 12, 15 , 18, 21... The common multiples are in the 3 and the 5 times tables such as 15.
16	Highest Common Factor (HCF)	The highest number that can be divided exactly into each of two or more numbers. E.g. 6 is the highest common factor of 12 and 18.
17	Lowest Common Multiple (LCM)	The lowest quantity that is a multiple of two or more numbers. 12 is the lowest common multiple of 3 and 4.
18	Product of Prime factors	What are the prime numbers that can be multiplied together to give the original number. It is usually worked out using a prime factor tree. $60 = 2 \times 2 \times 3 \times 5$. Or in index form: $2^2 \times 3 \times 5$
19	Vertices	Posh word for corner.
20	Edges	The border, outer limit of a shape.
21	Parallel lines	Lines that are always the same distance apart and never touch. For example, train tracks are parallel.
22	Perpendicular lines	Lines that are at right angles (90°) to each other.
23	Right angle	An angle of 90°
24	Polygon	A 2D shape with at least three straight sides and angles.
25	Rotational symmetry	In a full turn, how many times would the shape "land" on itself.
26	Alternate angles	Alternate angles are equal. 
27	Co-interior angles	Co-interior angles sum to 180 degrees. 
28	Corresponding angles	Corresponding angles are equal. 

29	Vertically opposite angles	Vertically opposite angles are equal.	Vertically opposite angles 
30	Scale factor	The amount you multiply, or divide by, to get from one shape to another.	
31	Bearing	A way of giving a direction. It has three components: 1) Always measured from North 2) Clockwise 3) Must be 3 Figures e.g. 030	
32	Coefficient	A number before multiplying a variable or an unknown. For example, the coefficient of $3x$ is 3. The coefficient of $10xy^2$ is 10.	
33	Power	A small number to tell you how many times to multiply the number by itself. It is usually at the top right of the base number. E.g. $10^6 = 10 \times 10 \times 10 \times 10 \times 10 \times 10$ E.g. $2^5 = 2 \times 2 \times 2 \times 2 \times 2$	
34	Root	The root of a number X is another number, which when multiplied by itself a given number of times, equals x. For example, the square root of 100 = 10. $\sqrt{100} = 10$. This is because $10 \times 10 = 100$. For example, the cube root of 8 = 2. $\sqrt[3]{8} = 2$	
35	Reciprocal	The reciprocal of a fraction is the fraction turned upside-down. For example, the reciprocal of $\frac{3}{7}$ is $\frac{7}{3}$ For example, the reciprocal of 2 is $\frac{1}{2}$	
36	Expression	An algebraic expression involves letter that represent numbers. They do not have an equals sign. For example, a or 6b or $x^2 + y^2 + z^2$ are all expressions.	
37	Identity	An equation that no matter what values are chosen, it will always be true. It is usually given with a triple equals sign (\equiv) For example, $x + x \equiv 2x$. This will always be true no matter what value of x you use. For example, $y \times y \equiv y^2$ will always be true no matter what value of y is chosen.	
38	Equation	An equation is a mathematical statement that two things are equal in value. It consists of two expressions, one on each side on an equals sign. E.g. $x + 3 = 10$	
39	Term	A single number or variable.	
40	Formula	A set of instructions for working something out. For example, $s = 4t + 3$ is a formula for S. It shows you how to find s assuming you know what t is.	


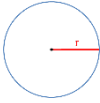



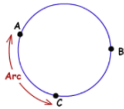
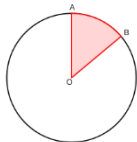
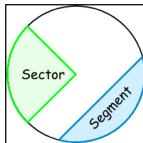
Year 9 Foundation Term 2

Term		Definition
1	Fraction	A fraction represents how many parts of a whole you have. The top number is called the <i>numerator</i> and the bottom number is called the <i>denominator</i> .
2	Co-ordinate	A set of values that show an exact position on a co-ordinate grid. (x, y). Remember, “along the corridor, up the stairs.”
3	Quadrant	
4	Axes	On a co-ordinate grid, x is the horizontal axis. Y is the vertical axis.
5	Decimal	A number that is not a whole number.
6	Terminating decimal	A number that contains a finite number of digits after the decimal point. E.g. $\frac{1}{2} = 0.5$
7	Recurring decimal	A number in which a digit or group of digits is repeated indefinitely after the decimal point. E.g. $\frac{1}{9} = 0.11111111 \dots$
8	Decimal places	The places to the right of the decimal point.
9	Significant figures	Each of the digits of a number that are required to “explain” a number, starting from the first non-zero digit. For example 0.000004 has 1 significant figure (s.f). 0.00204 has 3 significant figures (the 1 st s.f is 2, the 2 nd s.f is the 0 and the 3 rd s.f is the 4). You will need to round to 1 s.f. when you are asked to “estimate” a question.
10	Truncation	When you “chop” a number after a given number of decimal places, regardless of what number follows your given number of decimal places. E.g. Truncate 1.47 to 1 decimal place. This would be come 1.4 regardless that the 7 would usually round the digit up.
11	Upper bound	The upper limit of what a number could be. E.g. I weight 80kg to the nearest 5kg. The upper bound would be 82.5kg
12	Lower bound	The lower limit of what a number could be. E.g. I weight 80kg to the nearest 5kg. The lower bound would be 77.5kg
13	Frequency table	A table to record the number of times (frequency) that an event has happened.
14	Bar chart	A way of representing data where the bars are represented by heights or lengths of lines or rectangles with equal width. 
15	Pie Chart	A type of graph in which a circle is divided into sectors that represent a proportion of the whole. 
16	Pictogram	A way of illustrating data by using pictures, and parts of pictures to represent given numbers. 
17	Discrete data	Data that can only take certain values. E.g. the number of students in a class, your shoe size, number of cars in the car park.
18	Continuous data	Data that can take any value. E.g. temperature, time taken to run a race, height.
19	Grouped data	Data that has been grouped together into categories.
20	Primary data	Data collected yourself. E.g. you design and complete a survey of students yourself.
21	Secondary data	Data collected from somewhere else that you did not collect. E.g. data from a Government census.

Year 9 Foundation Term 3

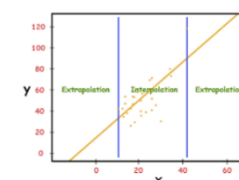
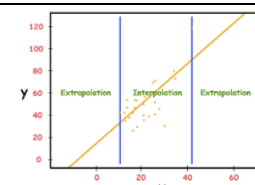
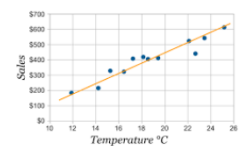
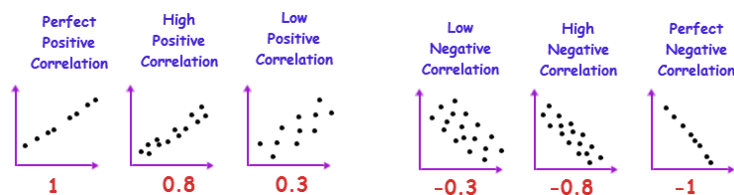
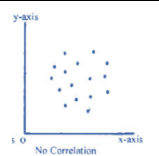
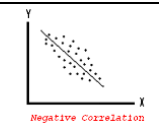
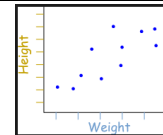
	Term	Definition
1	Term-to-term rule	When you have a sequence and can work out the following numbers. E.g. find the next three terms of this sequence, 10, 20, 30, ..., ..., ...
2	Position-to-term rule	This is an explicit rule you can find which allows you to find the 100 th term quite easily. E.g. $5n + 7$. 100 th term = $5(100)+7 = 507$
3	Triangle numbers	1, 3, 6, 10, 15, 21, 28... They form a triangle.
4	Square numbers	1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225. These form a square.
5	Cube numbers	1, 8, 27, 64, 135, 216... These numbers form a cube.
6	Arithmetic progression	A sequence that goes up or down by the same amount each time.
7	Fibonacci sequence	A sequence that is made by adding the previous two terms to give you the next term. 1, 1, 2, 3, 5, 8, 13, 21 ...
8	Quadratic Sequence	The difference between each term increases, or decreases, at a constant rate. The second difference is constant. E.g. 2, 6, 12, 20, 30, 42 ...
9	Geometric progression	A sequence with a constant ratio between each number and the one before. E.g. 1, 3, 9, 27, 81. Formula for a geometric progression = $a \times r^{n-1}$ A = First term R = common ratio (what do you multiply by each time)
10	Nth term	A formula that allows you to work out the rule for a sequence.
11	Percentage	A rate, number or amount out of 100.
12	Reverse percentage	When you are given a percentage that is not 100% and a value, and you need to work out the original value (100%). E.g. 40% = 24. So 10% = 6 So 100% = 60.
13	Multiplier	A number you can multiply by to do percentage increase or decrease in one step. E.g. Increase by 7% = Multiply by 1.07 Decrease by 8% = Multiply by 0.92
14	Faces	Each flat surface in a solid.
15	Surfaces	The outside layer of an object. It doesn't have to be flat.
16	Edges	Where two faces meet is called an edge.
17	Vertices	Posh word for a corner.
18	Pyramid	A 3D shape with a triangular or square base whose faces meet in a point at the top.
19	Cone	A 3D shape that has a circular base and the curved surface meets at a point. 
20	Sphere	The mathematical word for a ball. All the points on a sphere are the same distance from the centre of the sphere. 
21	2D shape	A flat shape with only two dimensions, width and height (no thickness)
22	Composite shape	A shape that can be split into more than one regular shape. 
23	Area of a triangle	$A = \frac{1}{2} \times \text{base} \times \text{perpendicular height}$
24	Area of a parallelogram	$A = \text{base} \times \text{perpendicular height}$ 
25	Area of a trapezium	$A = \frac{1}{2} \times (a + b) \times \text{perpendicular height}$ Where a and b are the two parallel sides. 

Year 9 Foundation Term 4

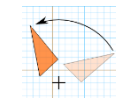
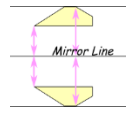
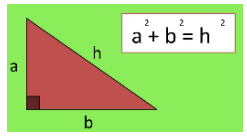
Term		Definition
1	Circle	A 2D shape where all points are the same distance from the centre.
2	Centre	
3	Radius	
4	Chord	A straight line that goes from one side of a circle to the other. 
5	Diameter	A straight line that goes from side of a circle to the other, through the centre. 
6	Circumference	The perimeter of a circle. The length all around the outside of a circle.
7	Tangent	A straight line that touches the edge of a circle once and once only. 
8	Arc	An arc is a portion of the circumference of a circle. 
9	Sector	A "pizza slice" of a circle, from the centre. 
10	Segment	The region between a chord and the circumference. 
11	Circumference of a circle	$Circumference = \pi \times diameter$
12	Area of a circle	$Area = \pi \times radius^2$
13	Ratio	A relationship between two numbers.
14	x: y is 3:4. Write an equation connecting x and y.	$x/y = 3/4$. Therefore $4x = 3y$. "Tilt the ratios."
15	Probability	Probability is the likelihood of something happening in the future. It is expressed as a number between 0 (impossible) and 1 (certain).
16	Frequency tree	A tree used to help work out the probability or likelihood of something happening. It is a way of illustrating information to make it easier to interpret.
17	Mutually exclusive	Mutually exclusive outcomes cannot happen at the same time. Flipping a coin has mutually exclusive outcomes, it can't be both heads and tails.
18	Theoretical probability	What is the probability of it happening in theory. E.g. The theoretical probability of rolling a 3 on a dice is $\frac{1}{6}$
19	Experimental Probability	What was the probability of it in real life when you actually did the experiment. This will differ from the theoretical probability initially but will get closer and closer with an increasing number of trials you do.

Year 9 Foundation Term 5

Term		Definition
1	Equations	An equation is a mathematical statement that two things are equal in value. It consists of two expressions, one on each side on an equals sign. E.g. $x + 3 = 10$
2	Substitution	Putting values where the letters are. E.g. $3x + 5$ Substitute $x = 4$ into the expression. $3(4) + 5 = 17$
3	Expressions	An algebraic expression involves letter that represent numbers. They do not have an equals sign. For example, a or $6b$ or $x^2 + y^2 + z^2$ are all expressions.
4	Linear equation	A straight line where all terms have the power 1 with no x^2 or x^3 terms.
5	Brackets	$5(x + 2) = 5x + 10$
6	Solve an equation with an unknown on both sides.	Take away the smaller "x" from both sides. E.g.
7	Scatter graphs	A graph of plotted points that show the relationship between two sets of data.
8	Bivariate data	Data involving two sets of related variables e.g. Height and Weight. It is often shown on a scatter graph.
9	Correlation	A relationship between two or more things.
10	Positive correlation	A relationship where if one variable decreases, the other decreases. If one increases, the other increases.
11	Negative correlation	A relationship where if one variable increases, the other decreases and vice versa.
12	No Correlation	Where there lies no relationship between two variables. variables have nothing to do with each other.
13	Strong correlation	
15	Line of best fit	A line drawn on a scatter graphs that has roughly the same number of points above the line as below the line, passing through as many points as possible.
16	Interpolation	This is when you use estimate a value from within your data set. It is a useful skill to have.
17	Extrapolation	Extrapolation is when you estimate a given value outside of your given data range. It is extremely dangerous to do this as you do not know for certain if the relationship you have identified continues before or outside of your data values.



Year 9 Foundation Term 6

Term		Definition
1	Transformations.	TERRY: Translations, Enlargements, Reflections, Rotations, Yeah!
2	Congruent shapes	Shapes that are exactly the same shape and size. Congruent triangles: SSS (Side, Side, Side) SAS (Side, Angle, Side) ASA (Angle, Side, Angle) RHS (Right Angle, Hypotenuse, Side)
3	Similar shapes	Two shapes where one is an enlargement of the other. Although the sides may be a different length, the angles will still remain the same.
4	Rotation	A circular movement around a point. A full rotation is a turn of 360° . 
5	Reflection	Each point in a shape appears the same distance on the opposite side of a line (the line of reflection). 
6	Translation	A transformation where a shape is just moved left/right and up/down. It is usually written as a column vector. For example, $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$ means 5 right, 2 down.
7	Enlargement	A transformation where one shapes has been enlarged by a given scale factor (can be larger or smaller). You also require a centre of enlargement.
8	Scale factor	This is the value of how much you have to multiply a shape to get from one shape to another. It can be positive, negative or even fractional.
9	Vectors	For example, $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$ means 5 right, 2 down. The top number tells you how far right/left (right is positive/left is negative). The bottom numbers tells you how far up/down (up is positive/down is negative).
10	Pythagoras' theorem	This is used when you have two sides of a right-angled triangle and you need to find out the third side. $a^2 + b^2 = h^2$ 
11	Front elevation	The front elevation is the straight on view, from the front.
12	Side elevation	The side elevation is the view from the side.
13	Plan	The plan is the "birds eye view" or view from above looking down.
14	Net	A pattern that you can cut and fold to make a model of a solid shape.