Maths Curriculum Progress Maps Grades 1-9

1	2	3	4	5	6	7	8	9

Algebra

1	2	3	4	5	6	7	8	9
Collect simple like terms like a + a + a	Collect like terms in an expression	Expand and simplify expressions with negative numbers	Expand and simplify two brackets with x	Expand and simplify two brackets with ax^2	Simplify algebraic fractions	Simplify expressions using a combination of the laws of indices	Write a formula based on indirect proportion	Algebraic compositie functions like fg(x)
Describe the difference between expressions and equations	Expand a single bracket	Factorise an expression with common factors	Use the nth term of a quadratic sequence	Use simple laws of indices	Use negative and fractional laws of indices	Write a formula based on direct proportion	Complete the square with x^2	Algebraic proof
Identify common factors between numbers	Form an equation	Write and use the nth term for an arithmetic sequence	Plot and understand features of linear graphs written in different forms	Factorise a quadratic expression with ax^2 into two brackets	Factorise with ax^2 into two brackets	Simplify algebraic fractions by factorising and cancelling common factors	Use and calculate gradients and intercepts of graphs	Factorise a cubic expression
Identify common multiples between numbers	Identify arithmetic progression as a times table with adjustment	Substitute positive and negative values into expressions involving x^2 and x^3	Use set notations when working with intervals	Calculate the gradient and length between any two points	Find the difference of two squares	Apply the four arithmetic rules to algebraic fractions	Transform a graph using af(x) and f(ax)	Complete the square with ax^2
Describe more challenging number patterns in words	Substitute positive values into linear expressions and formulae	Solve linear equations with the unknown on both sides		Substitute fractions, decimals and negative values into formulae	Plot and recognise graphs of quadratic, cubic and reciprocal functions	Transform a graph using f(x) + a, f(x + a), -f(x) and f(-x)	Recognise and use the equation of a circle	Write a formula of a function after a transformation
Solve simple one step linear equations	Plot coordinates involving negative numbers	Use trial and improvement to solve an equation		Solve linear simultaneous equations graphically	Write and use the nth term of any quadratic sequence	Identify graphs of different functions	Find the coorrdinate of the turning point in a quadratic	Find the equation of a tangent to a circle at a given point
Plot positive coordinates	Plot and understand simple lines	Plot and understand features of graphs in the form y = mx + c		Solve linear simultaneous equations algebraically	Solve linear inequalities	Change the subject of formula where a term appears twice	Solve trigonometric equations	Find approximate solutions to equations using iteration
	Solve a simple two step linear equation			Solve linear inequalities and represent on a number line		Solve a quadratic equation by factorising or using the graph	Solve a quadratic equation using the quadratic formula	
						Change the subject of a formula involving powers and fractions	Solve a quadratic equation by completing the square	
							Find the region of a graph satisfied by two or more inequalities	
							Solve equations involving algebraic fractions	
							Solve simultaneous equations which include a quadratic	

Number

1	2	3	4	5	6	7	8	9
Multiply and divide integers by 10 and 100	Mulitply and divide numbers by 10, 100 and 1000	Express one number as a fraction or percentage of another	Round to significant figures	Round to 1 significant figure and use this to estimate	Calculate multiplication and division with standard form	Simplify surds and rationalise the denominator in simple cases	Manipulate surds including multiplying out brackets	Rationalise the denominator of a fraction when the denominator has rational and/or irrational parts
Order decimal numbers	Add, subtract, multiply and divide numbers up to 2 decimal places	Understand when fractions, decimals and percentages are equal	Understand what happens when you muliply or divide a number between 0 and 1	Convert between decimal numbers and numbers written in standard form	Find the upper and lower bound of a value when rounded	Leave values in exact terms of Pi	Rationalise the denominator of a fraction when it is irrational	
Add, subtract, multiply and divide integers	Multiply and divide a three digit number by a two digit number without a calculator	Round to decimal places	Estimate square roots	Know that measurements given to the nearest whole number could be half a unit bigger or smaller	Calculate with powers and roots, including fractional and negative powers	Calculate addition and subtraction with standard form	Decide when it is appropriate to use upper and lower bounds	
Find and use inverse problems to solve	Estimate answers by rounding to the nearest place value	Calculate squares, cubes and small powers of numbers	Identify the HCF or LCM, possibly using prime factor decomposition	Add, subtract, multiply and divide combinations of fractions, decimals and integers		Use upper and lower bounds to calculate		
Know up to my 12x12 times tables	Order, add and subtract negative numbers	Calculate square roots and cube roots	Add, subtract, multiply and divide mixed numbers	Use simple laws of indices		Apply the four arithmetic rules to algebraic fractions		
Add and subtract decimal numbers with up to 2 decimal places	Identify equivalent fractions and simplify	Write a number as a product of its prime factors						
Identify common factors		Add, subtract, multiply and divide fractions						
Identify common multiples								

Shape, Space and Measures

1	2	3	4	5	6	7	8	9
Recognise the net of a 3D shape	Draw and measure angles and construct triangles using SAS and ASA	Use isometric drawings, plans and elevations	Calculate the length of the hypotenuse using Pythagoras' theorem	Solve problems in context using Pythagoras' theorem	Find missing lengths in similar shapes	Use Pythagoras' theorem and trigonometry to solve problems in 3D	Sketch the sin, cos and tan graphs with features	Use the sine and cosine rule to solve complex problems, including bearings
Reflect simple shapes in a mirror line	Calculate angles on a straight line, around a point, in a triangle, in a quadrilateral or vertically opposite	Know the names and angle properties of different quadrilaterals	Calculate and use the volume of triangular prisms and cylinders	Calculate and use the surface area of cubes, cuboids, triangular prisms and cylinders	Enlarge by a negative scale factor	Use the sine and cosine rule to calculate lengths, angles and areas	Use similarity to calculate the missing length or volume of a frustrum	Proof involving circle theorems
Use a compass and protractor to construct circles or measure angles	Identify lines of symmetry in a shape	Calculate and describe missing angles on parallel lines	Enlarge a shape by a fractional scale factor	Construct the locus of a point or region for a given rule	Use trigonometry in right-angled triangles	Use similarity to calculate area and volume	Calculate the area of segments	Solve related problems e.g. area and volume scale factors
Identify and use correct units of measurement	State the rotational symmetry of a shape	Calculate interior and exterior angles in polygons	Calculate with speed	Calculate compound measure, such as density, speed or pressure	Use a combination of trigonometry and Pythagoras to solve problems including bearings	Know the effect of enlargement on area and volume	Prove the circle theorems	
Find the area by counting squares	Calculate the area and perimeter of rectangles and squares	Construct and describe bearings	Describe a combination of transformations as a single transformation.	Understand that vectors represent movement and can be combined	Solve angle problems using circle theorems	Calculate lengths of arcs and areas of sectors	Algebraic proof using geometry	
Find the perimeter of simple shapes	Calculate the area of a triangle	Calculate the circumference and area of a circle	Construct a perpendicular from a point to a line	Solve simple problems with vectors	Calculate and derive the volume and surface area of cones, spheres and hemi-spheres	Prove that two triangles are congruent from constructions	Solve complex problems involving vectors	
Identify parallel and perpendicular lines	Construct and identify nets for cubes, cuboids and triangular prisms	Calculate the area of trapeziums, parallelograms and kites		Use trigonometry to find angles and sides in right angled triangles	Construct an angle of 60 degrees	Calculate vectors in 2D, finding resultants from commutative and associative laws	Calculate the angle between a line and a plane in 3D	
Know and be able to label different angles		Calculate the area of compund shapes involving rectangles and triangles		Know sin and cos for 0, 30, 45, 60 and 90 and know tan for 0, 30, 45 and 60.		Find angles in circles using the alternate segment theorem		
		Calculate the volume of cubes and cuboids						
		Perform and describes translations, rotations and reflections						
		Enlarge a shape by a positive integer scale factor						
		Construct perpendicular lines, angle bisectors and triangles with SSS or RHS						

Statistics and Probability

1	2	3	4	5	6	7	8	9
Record data in a frequency table	Identify the difference between continuous and discrete data	Decide how to group data using class-intervals.	Find the modal class the group with the median value for grouped data	Estimate the mean from grouped data	Plot cumulative frequency curves	Construct and interpret histograms	Solve problems involving histograms and frequency density	Understand how sample size and structure can affect results
Group data in equal classes and display in a table	Calculate the mean, mode, median and range from a set of numerical data	Calculate and interpret the mean, mode, median and range from a frequency table	Find upper and lower quartiles in a set of data and interquartile range	Construct box plots	Solve problems using cumulative frequency curves	Understand how bias affects results		
Use and explain mode and range	Explain what a pie chart shows, involving fractions and percentages	Recognise and describe causes of bias	Draw and interpret frequency polygons	Use box plots to compare data	Find medians, quartiles and interquartile range from a cumulative frequency curve	Calculate, compare and describe measures of spread using cumulative frequency and box plots		
Explain what a bar chart, pictogram and a simple pie chart shows	Find theoretical probability and experimental probability	Construct a pie chart	Draw a line of best fit and describe correlation on a scatter diagram	Calculate relative frequency	Calculate combined probabilities for independent events	Use tree diagrams to solve problems involving conditional probability		
Collect and present data e.g. frequency tables, line graphs etc.		Construct and interpret a stem and leaf diagram	Construct tree diagrams		Draw and use a tree diagram for combined events	Understand how one event can be affected by another in conditional probability		
Position or describe events on a probability scale from 0 to 1		Construct a scatter diagram and describe the relationship				Use and describe different methods of sampling		
		Find all combinations of two events				Calculate the numbers needed for stratified sampling		
		Understand and identify relative frequency				Use a tree diagram for specific outcomes of combined events		
		Describe probabilities as fractions, decimals and percentages						

Ratio and Proportion

1	2	3	4	5	6	7	8	9
Identify and shade fractions of objects	Calculate percentages and fractions of amounts	Increase or decrease an amount by a percentage	Increase or decrease an amount by a percentage using a multiplier	Calculate and understand simple interest and depreciation	Calculate and understand compound interest and depreciation	Understand the formulae for compound interest and depreciation	Calculate limits of accuracy for compound measures and interpret results	Solve problems involving exponential growth and decay
Work out simple fractions and percentages of amounts	Identify equivalent fractions and simplify to their simplest form	Understand the relationship between ratios and fractions	Divide an amount into a given ratio	Use and understand inverse proportion	Calculate the original amount given the percentage change and new value	Convert a recurring decimal into a fraction	Recognise exponential growth and decay	
	Identify simple equivalence between fractions, decimals and percentages	Simplify a ratio to its simplest form	Use and understand direct proportion e.g. recipes	Construct graphs of rates of change	Interpret the gradient at a point on a curve as the instantaneous rate of change	Solve complex problems involving percentage increase and decrease	Apply concepts of average and instantaneous rate of change in different contexts	
	Calculate a fraction of an amount	Divide an amount into a given ratio with two parts	Construct graphs of rates of change			Construct formulae for direct and inverse proportion		
	Identify equivalent ratios	Interpret and use graphs of conversion/change				Apply concepts of average and instantaneous rate of change.		