

Maths KS3 Pathway Statements

Students will be taught to:

- Become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- Solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Stage	Number	Algebra	Geometry and Measures	Ratio, Proportion and Rates of Change	Probability & Statistics
7	<ul style="list-style-type: none"> • Expand single brackets with surds and simplify • Rationalise simple denominators with surds 	<ul style="list-style-type: none"> • Expand trinomials • Find the equations of parallel and perpendicular lines • Finding nth term of a quadratic sequences • Rearranging equations involving factorisation • Find approximate solutions to graphs • Draw cubic and reciprocal graphs • Form and solve equations from worded problems 	<ul style="list-style-type: none"> • Form and solve equations from geometric problems • Solve angle in polygon problems including combined used of rules • Solve problems using trigonometry 	<ul style="list-style-type: none"> • Calculate reverse percentages 	<ul style="list-style-type: none"> • Interpret stem and leaf diagrams
6	<ul style="list-style-type: none"> • Solve worded standard form calculations and manipulation • Simplify surds • Calculate with surds 	<ul style="list-style-type: none"> • Expand, factorise and solve double brackets • Determine $y=mx+c$ from a linear graph • Generate terms in a quadratic sequence • Rearranging equations with powers and roots. • Plotting quadratic graphs from a table • Fractional and negative index laws 	<ul style="list-style-type: none"> • Solve problems using angle in parallel line facts • Use the rules for angles in polygons to find the sum of interior angles/exterior angles • Answer combination transformation problems • Solve problems using Pythagoras 	<ul style="list-style-type: none"> • Solve exchange rate problems • Calculate percentage change 	<ul style="list-style-type: none"> • Find averages from a grouped frequency table • Construct stem and leaf diagrams • Interpret and read from scatter graphs
5	<ul style="list-style-type: none"> • Find HCF/LCM of more complex numbers (using Venn diagrams) • Basic standard form calculations 	<ul style="list-style-type: none"> • Solve complex equations with fraction and brackets • Confidently use and interpret algebraic notation • Find nth term of a linear sequence • Rearrange two-step equations • Form and solve equations • Multi-step index laws 	<ul style="list-style-type: none"> • Use conversion graphs to answer problems that involve scaling • Plot and interpret distance time graphs • Solve speed, distance time problems with unit conversions • Solve mass, density volume problems with unit conversions • Recognise and find angles in parallel lines • Enlarge shapes from a point • Describe transformations • Reverse area and circumference of a circle 	<ul style="list-style-type: none"> • Solve combination ratio problems • Solve problems involving ratios, fractions and percentages • Solve ratio and proportion problems that 	<ul style="list-style-type: none"> • Plot and interpret pie charts • Construct scatter graphs • Find averages from frequency tables • Calculate the probability of events and represent it on a number line • Construct and

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			<ul style="list-style-type: none"> Area and perimeter of part circles Find the area of compound shapes including circles Find the volume and surface area of compound shapes Find the volume and surface area of cylinders 	include conversions	interpret frequency trees, polygons and two-way tables
4	<ul style="list-style-type: none"> Express numbers as a product of its prime factors More complex estimation problems and worded problems Convert between standard form and ordinary numbers Reverse fractions of amounts Worded fraction problems 	<ul style="list-style-type: none"> Solve equations with brackets and x on both sides Simplify algebraic expressions with powers Substitute into scientific formulae Expand and factorise a single bracket Plot linear graph using a table of values Generate numbers in a sequence from a given rule Rearrange one step equations Use the 4 index laws 	<ul style="list-style-type: none"> Plot and interpret conversion graphs Solve speed, distance time problems Solve mass, density volume problems Rotate, reflect and translate shapes Enlarge shapes (any place) Area of compound shapes including triangles and parallelograms Reverse area of a trapezium Area and circumference of circle Reverse volume and surface area in cubes and cuboids Volume and surface area of triangular prisms 	<ul style="list-style-type: none"> Solve best buy problems Share a ratio, give the difference or one share Simplify ratios in the form 1:n Use multipliers to find percentages of number, increase and decrease 	<ul style="list-style-type: none"> Populate venn diagrams and find probabilities Describe the probability of an event Systematically list outcomes Understand that all probabilities add to 1
3	<ul style="list-style-type: none"> Convert more complex fractions decimals and percentages Find HCF/LCM of small numbers Round to SFs Estimate calculations using rounding to 1SF for basic estimation problems Calculate non-unitary fractions of amounts Four operations with mixed numbers and fractions Multiply and divide decimals 	<ul style="list-style-type: none"> Solve two step equations Simplify expressions by collecting like terms Substitute into expressions Start to use and interpret algebraic notation Multiply single algebraic terms Calculate gradient of linear graphs 	<ul style="list-style-type: none"> Find miss angles in combined problems where more than one rule applies Find the area of a trapezium Reverse problems with area of basic 2d shapes Area of compound shapes (rectangular only) Volume of cubes and cuboids Surface area of cubes and cuboids 	<ul style="list-style-type: none"> Solve recipes problems Find harder percentages without a calculator eg 37% Increase and decrease simple percentages without a calculator Share a ratio when given the total 	<ul style="list-style-type: none"> Plot and interpret bar charts and pictograms Plot scatter graphs Find the mean, median, mode and range Use words to describe probabilities
2	<ul style="list-style-type: none"> Convert simple fractions, decimals and percentage Find squares, cubes and roots. squares, cubes and roots Four operations with negatives 	<ul style="list-style-type: none"> Solve single step equations Read and plot coordinates Determine the next number or draw the next picture in a basic sequence 	<ul style="list-style-type: none"> Use basic angle facts to find missing angles eg singular questions on straight lines, triangles and quadrilaterals including vertically opposite Perimeter and area of triangles, parallelogram and rectangles including 	<ul style="list-style-type: none"> Find simple percentages without a calculator eg 50%, 25% 10% 1% 	<ul style="list-style-type: none"> Calculate the mean as an average Draw a line graph from data, given a labelled axis

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	<ul style="list-style-type: none"> Identify all factors/multiples of numbers and primes up to 20 BIDMAS with powers and roots Round to DP Express a fraction as a number of another Unitary fractions of amounts Convert between mixed numbers and fractions Four operations with fractions Add and subtract decimals 		<ul style="list-style-type: none"> decimals and fractions Translate and reflect shapes Measure lengths of lines Construct accurate nets of shapes 	<ul style="list-style-type: none"> Use a calculator to find percentages Convert basic measurements, given conversions eg g/kg cm/m/km Simplify a ratio 	
1	<ul style="list-style-type: none"> Order numbers and use inequality symbols Identify a factor/multiple of a number Basic BIDMAS Round to 10, 100, 1000 Simplify basic fractions 	<ul style="list-style-type: none"> Know that an unknown number can be represented with a letter 	<ul style="list-style-type: none"> Name and recognise types of angles Estimate angles Perimeter and area of rectangles with whole numbers Draw a 2D shape Recognise and match nets to shapes 	<ul style="list-style-type: none"> Write numbers in a ratio given a scenario 	