

Maths Curriculum Map KS3 (2026 - 2027)

	Year 7	Year 8	Year 9
Autumn 1	<u>Arithmetic & Properties of Number</u> - Show competency with addition and subtraction of values using written column methods - Multiply and divide integers and decimals by powers of 10. - Understand place value for integers and decimals. - Perform increasingly complex calculations involving all four operations with whole numbers and decimals & understand opposites - Understand the meaning of a power and begin to use powers in calculations - Round numbers to the nearest power of 10 and given number of decimal places. - Calculate using the order of operations for integers, decimals - Use connecting operations with real life problems. <u>Factors, Multiples and Common Sequences:</u> - Understand factor and multiple and the correct terminology when describing both. - Understand and recognise when a value is a multiple of 2, 3, 5 or 10 using known facts. - Describe and understand a prime number and its properties. - Generate describe and continue special sequences such as odd, even, triangular, square numbers. - Understand and generate square numbers and properties of square numbers	<u>Sequences:</u> - Work out the terms of an arithmetic sequence using the term to term rule. - Work out a given term in a simple arithmetic sequence. - Generate sequences and predict how they will continue. - Generate describe and continue special sequences. - Recognise geometric sequences and work out the term-to-term rule. - Generate terms of a sequence using the position-to-term rule. - Work out and use expressions for the nth term in an arithmetic sequence - Describe sequences arising in real life. - Continue a quadratic sequence. - Generate terms of a quadratic sequence. - Make links to plotting graphs. <u>Forming and Solving Equations</u> - Understand equality in algebraic relationships Be able to solve simple linear equations - Experience manipulating pictorial and abstract algebraic representations - Understand algebraic relationships embedded within various contexts - Be able to form and solve linear equations with unknowns on both sides - Experience representing and manipulating algebraic relationships <u>Linear Graphs :</u> - Students start the unit on linear graphs by visiting and revisiting familiar contexts on the Cartesian plane, such as using coordinates, horizontal and vertical lines and inequalities - Understand a linear relationship can be recognised from a constant rate of change in the coordinates - Be able to identify the gradient of a line from its graph and from a set of coordinates - Experience connecting a linear equation to its graphical representation - Understand a linear relationship can be described using algebra in the form $y=mx+c$ - Be able to identify the equation of a line and draw a line from its equation - Experience moving between three representations of a linear relationship: coordinates, graphs and equations	<u>Fractions, decimals & percentages</u> - Understand the connections between methods of calculation for fractions, decimals and percentage - Be able to apply the four operations to fractions, decimals and percentage - Experience manipulating and comparing methods of calculation involving fractions, decimals and percentage <u>Probability</u> - Understand probability is a numerical measure of chance from 0 to 1 inclusive - Be able to calculate the probability of single independent events - Experience comparing probabilities using a variety of representations - Understand a variety of representations of combined events - Be able to calculate the probability of a pair of combined events - Experience using a variety of techniques to solve problems <u>Forming and Solving Inequalities:</u> - Understand different representations of inequalities - Be able to test and solve linear inequalities - Experience manipulating and explaining different inequality representations - Understand inequalities as representations of numerical relationships from a range of contexts - Be able describe solve inequalities including with unknowns on both sides - Experience manipulating inequalities and exploring the conditions for preservation of the relationship

Autumn 2	<u>Prime Factor Decomposition</u> - Understand integers greater than 1 are either prime or can be made by multiplying primes in exactly one way - Be able to find the product of prime factors of a three digit composite number - Experience using prime factorisation to find the square root of a square number - Understand integers greater than 1 are either prime or can be made by multiplying primes in exactly one way - Be able to find the product of prime factors of a three digit composite number - Experience using prime factorisations to find the square root of a square number <u>Order Of Operation:</u> - Understand equal and unequal order of priority between addition, subtraction, multiplication and division - Be able to interpret and write calculations involving the four operations, indices and brackets - Experience connecting calculations to a variety representations <u>Positive and Negative Numbers</u> - Understand what positive and negative numbers are and how they exist in real life - Be able to solve simple addition problems involving negative numbers - Experience representing positive and negative numbers on number lines	<u>Indices:</u> - Understand the notation and what it represents - Understand and use negative indices - Understand and use fractional indices - Understand the power of zero - Combinations of negative a fractional indices - Combining indices and the rules also the use of brackets - The use of powers of 10 <u>Standard Form:</u> - Know the rules for standard form - Writing values in standard form, big and small - Calculating with standard form values - Calculating with SF on a calculator <u>Accuracy & Estimation:</u> - Understand rounding is a method of approximation - Be able round to decimal places and 'to the nearest' - Experience using rounded numbers to estimate	<u>Solving Simultaneous</u> - Be able to solve and manipulate linear equations with one or more variables - Understand how equivalence can be maintained while scaling and rearranging equations - Understand how variables and unknowns interact within a system of equations - Understand that addition and subtraction of simultaneous equations can result in the elimination of a variable - Experience pattern spotting and conjecturing to establish formal methods for eliminating variables - Be able to use equivalent equations – through scaling and rearranging – to solve simultaneous equations <u>Solving Simultaneous Equations Graphically:</u> - Understand coordinates as solutions to linear equations, including intersections as simultaneous solutions - Be able to solve simultaneous linear equations graphically - Experience visualising trends in and intersections of linear equations - Understand parallel lines have no solution as they do not intersect - Be able to identify whether a pair of simultaneous equations have a solution algebraically and graphically - Experience connecting graphical and algebraic representations of linear relationships
Spring 1	<u>Expressions, Equations and Inequalities</u> - Understand that algebra is used to express mathematical structures, and that algebraic terms represent numbers that are unknown or variable - Be able to substitute (into), simplify, expand and factorise algebraic expressions - Understand what is meant by an equation and an inequality - Be able to manipulate equations and inequalities to form new equations and inequalities. - Be able to form expressions and inequalities in a new context - Be able to simplify and manipulate algebra in a new context - Experience generalising patterns and how algebra can be used to	<u>Ratio</u> - Understand the relationship between ratio and other proportional descriptors - Be able to use models and equivalence to solve ratio problems - Experience models and contexts relating to ratio <u>Direct and Inverse Proportion</u> - Understand multiplicative relationships - Be able to use scale factor and constant of proportionality independently to find missing values in directly proportional relationships - Experience different representations of the constant of proportionality, including gradient	<u>Angles</u> - Understand angle theorems are used to calculate angles without the need from measures - Able to calculate unknown angles using multiple angle theorems - Justifying deductions using chain reasoning - Able to estimate the size of an angle - Draw an angle accurately using a protractor - Understand parallel line rules - Understand angles at a point, vertically opposite angles - Properties of special triangles - Understand interior and exterior calculations for regular polygons using the formula $180 \times \text{number of sides}$ for the exterior. <u>Constructions, congruence & Loci</u>

	- represent them. <u>Coordinates</u> - Understand coordinates are used to describe a position on a coordinate grid - Be able to read and plot coordinates on axes with different scales - Experience coordinates in horizontal and vertical lines - Understand gradient is the slope or 'steepness' of a line graph - Be able to plot line graphs from a given relationships between the coordinates - Experience finding parallel and perpendicular lines by considering right angled triangles	- Be able to identify the scale factor and constant of proportionality for any two directly proportional measures (including non-integer values) - Understand key features of inversely proportional relationships - Be able to find missing values from directly and inversely proportional relationships, and state the constant of proportionality in each case - Be able to use algebraic notation to describe directly and inversely proportional relationships	- Understand circles can be used to draw the locus of a point that are given distances from a point. - Construct given shapes - Construct equilateral triangles and 60 degrees - Perpendicular and angle bisectors within a geometric problem. - Understand congruence and the conditions for congruence between given triangles - Know SAS, ASA <u>Pythagoras</u> - Understand that radical notation can be used to describe slanted noninteger lengths and how this relates to squares and right-angled triangles - Be able to find any missing length of a right-angled triangle by knowing that the square of the hypotenuse is equal to the sum of the squares of the other two sides - Be able to identify opportunities to use Pythagoras's theorem in non obvious contexts - Understand that perpendicular lines are often an opportunity to use Pythagoras' theorem
Spring 2	<u>Angles</u> - Understand that an angle is a measure of turn - Be able to find missing angles at a point and on a line - Experience constructing chains of reasoning, giving justifications for each step - Understand that two parallel straight lines will never meet - Understand that two lines that are not parallel will meet exactly once - Be able to identify angles that are equal and pairs of angles that sum to 180 degrees using angle rules in parallel lines <u>Classifying 2D Shapes</u> - Understand shapes have properties such as number of sides, number of equal sides, number of equal angles, and number of lines of symmetry - Be able to identify lines of symmetry - Experience categorising shapes according to a range of properties - Understand rotational symmetry means a shape can be turned to fit over itself exactly - Be able to name quadrilaterals accurately - Experience classifying quadrilaterals according to equal sides, equal angles, parallel sides and length of diagonals	<u>Data</u> - Understand different types of data - Be able to interpret and represent data in different ways - Experience collecting and analysing data in multiple representations - Understand the mean is a way of sharing out equally - Be able to use the mean to solve problems - Experience using different representations of data in mean problems - Understand mean, median, mode and range - Be able to find averages from different representations of data - Experience interpreting averages - Understand that in bivariate data each data entry has 2 connected values - Be able to represent bivariate data with a scatter diagram, and to read data from a scatter diagram - Be able to identify trends in bivariate data and use mathematical language to describe trends. - Understand how scatter graphs help make predictions about hypothetical data - Be able to find averages from scatter graphs - Experience mathematical reasoning to discuss correlations versus causation	<u>Ratio:</u> - Understand ratios describe proportional relationships - Be able to describe proportional relationships using ratios and fractions - Experience using scale factors, constants of proportionality and unit ratios to solve problems <u>Similarity & Enlargement:</u> - Understand ratios describe proportional relationships - Be able to describe proportional relationships using ratios and fractions - Experience using scale factors, constants of proportionality and unit ratios to solve problems - Understand ratios describe proportional relationships - Be able to describe proportional relationships using ratios and fractions - Experience using scale factors, constants of proportionality and unit ratios to solve problems <u>Trigonometry</u> - Understand that every right-angled triangle is similar to a right angled triangle drawn within a unit circle. - Be able to find the length of a side in right-angled triangles from a given angle and the length of the hypotenuse, including through using sine and cosine functions. - Understand that the relationship between the opposite and adjacent is held constant by a set angle - Be able to directly find the length of the opposite from the adjacent and given angle (and vice versa)

			Be able to find any angle in a right-angled triangle from two known side lengths.
Summer 1	<u>Area and Perimeter of 2D Shapes</u> - Be able to work out perimeters and areas of different shapes - Understand perimeter as a measure of length expressed in appropriate units - Experience connecting perimeter calculations to shapes using axioms of number and algebra - Be able to work out the area and perimeter of rectilinear shapes, parallelograms and triangles - Understand the formulae for area of parallelograms and triangles involves the height perpendicular to a chosen base - Experience reasoning how areas can be calculated including deriving area formula <u>Conceptualising Fractions</u> Be able to represent fractions pictorially and abstractly Understand the roles of numerator and denominator in describing numerical value Experience a variety of representations revealing different conceptualisations of fractions Understand fractions with the same value can be written in different ways Be able to convert between fractions and decimals Experience comparing fractions using a variety of representations <u>Manipulating Fractions</u> - Be able to multiply integers and fractions by fractions - Understand fractions as operators where the product is found by multiplying denominators and numerators - Experience representing fraction multiplication pictorially to underpin calculation methods - Be able to divide by fractions efficiently - Understand the connections between equivalent and inverse operations when $\times$ and $\div$ by fractions - Experience reasoning the connections between equivalent and inverse operations - Be able to add and subtract fractions - Understand how to use and represent common denominators and the lowest common denominator - Experience comparing the efficiency of using different calculation approaches when adding fractions	<u>Angles in Polygons:</u> - Understand polygon, interior and exterior angles. - Constructing and deconstructing polygons into/from triangles - Know sum of interior angles in a triangle - Finding missing angles in polygons - Regular polygons and the connection with sides and exterior angles - Calculation of interior angles from exterior angles - Use of algebra with missing angles <u>Percentages</u> - Understand percentages are a useful tool for comparing amounts - Be able to write a proportion as a percentage, convert between fractions, decimals and percentage and mentally calculate percentages of amounts - Experience working with a changing 'whole' in the same set of data - Be able to work out percentages of amounts and percentage increase and decrease - Understand how to use decimal multipliers to increase and decrease by a percentage - Experience developing and manipulating calculation strategies when working with percentage	<u>Working with Algebra:</u> - Understand algebraic conventions - Be able to manipulate algebraic expressions by expanding brackets and simplifying or factorising - Experience multiple representations of algebraic structures - Understand a variable can take any value whilst an unknown has a fixed value (or values) - Be able to evaluate expressions, solve single variable equations, and represent equations with 2 variables graphically - Experience the effect of changing the order of operations on the value of an expression <u>Quadratic equations:</u> - Understand that quadratics are expressions and equations that include a squared variable (and no higher order power) - Understand that the shape of a quadratic graph is different from a linear graph - Be able to evaluate quadratic expressions for a given value, and use these values to plot graphs of quadratic equations - Understand that quadratic graphs can be used to give us information about x and y values - Understand that every x-value can be mapped to a single y-value but not the other way around - Understand that quadratics can be written in a factorised form, expressed as two brackets - Be able to expand double brackets with x coefficients of 1 and positive constants - Understand expanding brackets as a multiplication of two partitioned numbers and use models of multiplication to find quadratics and other polynomials in their standard form - Be able to expand double brackets including those with negatives and non-1 x coefficients - Experience different representations of quadratics and spot patterns in how the algebraic forms relate to graphical forms

Summer 2	<u>Ratio:</u> • Understand ratio tells us about proportion, not amounts • Be able to simplify and scale ratios • Experience using tables and bar models to find amounts • Be able to divide an amount into a ratio, identify the constant of proportionality and move between fractional and ratio written representations • Understand the relationship between parts and the whole when working with fractions and ratios together • Experience the impact of defining the whole differently when working with combined parts	<u>Circles:</u> • Understanding Pi and the ratio of the diameter to circumference • Know all names involved with the anatomy of a circle • Calculation of circumference and area • Calculation of parts of circles from given information • Solving perimeter problems involving compound shapes and arc lengths <u>Volume & Surface Area:</u> • Understanding of dimension and solid shapes having 3 dimensions • Finding the surface area of a cube and cuboid • Use of nets for calculation of surface area • Know the terminology with 3d shapes including edge, face, vertex • Calculate volume • Know that surface area is its net and that volume is what would "fill the inside" • Understanding a prism and classifying shapes into prism or not • Calculation of both surface area and volume of prisms including cylinders	<u>Surds</u> • Understand surd notation • Identify surds • Know surds are irrational • Know a surd multiplied by itself gives the value $\sqrt{a} \times \sqrt{a} = a$ • Simplify a surd into a rational and irrational part • Estimate a surd on a number line • Give answers in surd form • Rationalise a single denominator

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