

Curriculum overview: Maths (foundation tier)

Key Stage 2	
Number and Ratio - To have a good understanding of place value and to be able to round whole numbers to appropriate degrees of accuracy. - To have a good understanding of negative numbers. - To use mental and written methods for all four operations. - To solve multi-step problems in contexts, deciding which operations and methods to use and why. - To use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. - To use their knowledge of the order of operations to carry out calculations involving the four operations. - To identify common factors, common multiples and prime numbers and to apply this knowledge to simplify fractions. - To add and subtract fractions with different denominators and mixed numbers. - To multiply simple pairs of proper fractions and to divide proper fractions by whole numbers. - To compare and order fractions, including fractions > 1. - To multiply and divide numbers by a power of 10. - To multiply one-digit numbers with up to two decimal places by whole numbers. - To recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. - To describe positions on the full coordinate grid (all four quadrants). - To draw and translate simple shapes on the coordinate plane, and reflect them in the axes. - To solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. - To solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison. - To solve problems involving similar shapes where the scale factor is known or can be found. - To solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.	Geometry - To solve problems involving the calculation and conversion of units of measure. - To use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places. - To convert between miles and kilometres. - To recognise that shapes with the same areas can have different perimeters and vice versa. - To calculate the area of parallelograms and triangles. - To calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3]. - To draw 2-D shapes using given dimensions and angles. - To illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. - To recognise, describe and build simple 3-D shapes, including making nets. - To compare and classify geometric shapes based on their properties and sizes. - To find unknown angles in any triangles, quadrilaterals, and regular polygons. - To recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
Algebra - Simplify expressions by collecting like terms - Substitute into a simple expression - Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) - Use simple formulae in words, and express missing number problems algebraically. - Generate and describe linear number sequences. - Find possible values in missing number problems and equations involving 1 or 2 unknowns.	Statistics and Probability - To complete, read and interpret information in tables, including timetables - To solve comparison, sum and difference problems using information presented in a line graph - To interpret and construct pie charts and line graphs and use these to solve problems. - To calculate and interpret the mean as an average.

Key skills/content requirements at GCSE						
Number and ratio	Algebra	Statistics and probability	Geometry			
- Fractions - Percentages - Ratio - Proportion - Fraction, decimal, percentage conversions - Multiples, factors and prime factorisation - Calculations involving currency - Problem solving - Standard Form - Indices - Surds	- Linear and non-linear graphs - Expanding and simplifying - Factorisation - Forming and solving equations - Inequalities - Rearranging formulae - Simultaneous equations - Quadratic expressions and equations - Algebraic proof - Algebraic fractions - Direct and inverse proportionality - Functions - Linear and quadratic sequences	- Theoretical and experimental probability - Independent and dependent events - Conditional probability - Venn diagrams - Sample space diagrams - Scatter graphs - Pie charts - Tree diagrams - Cumulative frequency graphs - Box plots - Histograms - Averages from diagrams and tables - Sampling	- Transformations - Constructions - Pythagoras' theorem - Trigonometry - Congruence and similarity - Angle facts and geometrical reasoning - Vectors - Circle theorems - Perimeter - Area of triangles and quadrilaterals - Circles, sectors and segments - Estimating the area under a curve - Volume and Surface area - Trigonometric graphs - Conversions - Maps and scales			
Curriculum Overview/Rationale						
The key stage 3 curriculum for year 7 – 9 is based on the White Rose Maths curriculum whilst the key stage 4 curriculum has been created by the curriculum leaders of the FSG. Some students will follow the White Rose support curriculum at Key Stage 3 and Stage 4. The curriculum is in blocks which will allow students to delve deeply into each topic that we cover, using multiple representations and links to real-world mathematics to ensure they make sense. This means that you will be able to really ‘get to grips’ with the key ideas and to see how so much of mathematics is linked together like a spider’s web. Students studying mathematics at Four Stones will develop confidence and foster a genuine enjoyment for the subject by getting you thinking critically every lesson. Some topics will be recovered throughout the whole curriculum, and we use assessment to ensure key knowledge is secure and will be revisited if there are any gaps in understanding. Students should expect to feel challenged in every lesson and not to find that you can whizz through the questions – this is really important and builds up resilience as well as a solid understanding. Lessons will be full of discussion, questioning, proving and explaining. Mathematics at Four Stones will expand your mind – you are going to love it!						
	Term 1	Term 2	Term 3	Portable knowledge	Key terms	
Year 7 (same as higher)	Half term 1: Algebraic thinking Sequences - Describe and continue a sequence given diagrammatically - Predict and check the next term(s) of a sequence - Represent sequences in tabular and graphical forms - Recognise the difference between linear and non-linear sequences - Continue numerical linear sequences - Continue numerical non-linear sequences - Explain the term-to-term rule of numerical sequences in words	Half term 1: Applications of number Solving problems with addition and subtraction - Properties of addition and subtraction - Mental strategies for addition and subtraction - Use formal methods for addition and subtraction of integers and decimals - Choose the most appropriate method: mental strategies, formal written or calculator - Solve problems in the context of perimeter - Solve financial maths problems	Half term 1: Lines and angles Constructing, measuring and using geometric notation - Understand and use letter and labelling conventions including those for geometric figures - Draw and measure line segments including geometric figures - Understand angles as a measure of turn - Classify angles - Measure angles up to 180° - Draw angles up to 180° - Draw and measure angles between 180°and 360° - Identify perpendicular and parallel lines	Times tables Written calculations Order of operations Negative numbers Rounding Estimation Types of number HCF LCM Angle facts Time Area Fraction manipulation Fraction operations Metric units Using algebraic notation	Acute angle Algebra Angle Area Average Axis Brackets Calculate Centilitre (cl) Centimetre (cm) Cube number Cuboid Decagon Decimal Decrease Denominator Difference Distance Equal	Multiple Negative Nonagon Numerator Obtuse angle Octagon Odd number Operation Order Parallel Parallelogram Pentagon Perimeter Perpendicular Polygon Positive number Power Prime Prism

	▪ Find missing numbers within sequences Understand and use notation ▪ Given a numerical input, find the output of a single function machine ▪ Use inverse operations to find the input given the output ▪ Use diagrams and letters to generalise number operations ▪ Use diagrams and letters with single function machines ▪ Find the function machine given a simple expression ▪ Substitute values into single operation expressions ▪ Find numerical inputs and outputs for a series of two function machines ▪ Use diagrams and letters with a series of two function machines ▪ Find the function machines given a two-step expression ▪ Substitute values into two-step expressions ▪ Generate sequences given an algebraic rule ▪ Represent one-and two-step functions graphically Equality and equivalence ▪ Understand the meaning of equality ▪ Understand and use fact families, numerically and algebraically ▪ Solve one-step linear equations involving $+/=$ using inverse operations ▪ Solve one-step linear equations involving $\times/\div$ using inverse operations ▪ Understand the meaning of like and unlike terms ▪ Understand the meaning of equivalence ▪ Simplify algebraic expressions by collecting like terms, using the $\equiv$ symbol	▪ Solve problems involving tables and timetables ▪ Solve problems with frequency trees, bar charts and line charts ▪ Add and subtract numbers given in standard form Solving problems with multiplication and division ▪ Properties of multiplication and division ▪ Understand and use factors and multiples ▪ Multiply and divide integers and decimals by powers of 10 ▪ Multiply by 0.1 and 0.01 ▪ Convert metric units ▪ Use formal methods to multiply and divide integers and decimals ▪ Understand and use order of operations ▪ Solve problems using the area of rectangles, parallelograms and triangles ▪ Solve problems using the area of trapezia ▪ Solve problems using the mean ▪ Explore multiplication and division in algebraic expressions Fractions and percentages of amounts ▪ Find a fraction of a given amount ▪ Use a given fraction to find the whole and/or other fractions ▪ Find a percentage of a given amount using mental methods ▪ Find a percentage of a given amount using a calculator	▪ Recognise types of triangle ▪ Recognise types of quadrilateral ▪ Identify polygons up to a decagon ▪ Construct triangles using SSS ▪ Construct triangles using SSS, SAS and ASA ▪ Construct more complex polygons ▪ Interpret simple pie charts using proportion ▪ Interpret pie charts using a protractor ▪ Draw pie charts Developing geometric reasoning ▪ Understand and use the sum of angles at a point ▪ Understand and use the sum of angles on a straight line ▪ Understand and use the equality of vertically opposite angles ▪ Know and apply the sum of angles in a triangle ▪ Know and apply the sum of angles in a quadrilateral ▪ Solve angle problems using properties of triangles and quadrilaterals ▪ Solve complex angle problems ▪ Find and use the angle sum of any polygon ▪ Investigate angles in parallel lines ▪ Understand and use parallel line angle rules ▪ Use known facts to obtain simple proofs Half term 2: Reasoning with number Developing number sense ▪ Know and use mental addition, subtraction,	Substitution into algebraic expressions/formulae Solving equations Converting between FDP	Equation Equilateral triangle Estimate Even number Expand Expression Factor Factorise Figures Frequency Gram (g) HCF Heptagon Hexagon Increase Integer Kilogram (Kg) Kilometre (Km) LCM Litre (l) Mean Median Metre (m) Millilitre (ml) Millimetre (mm) Mode	Probability Product Quadrilateral Range Ratio Reflex angle Regular Remainder Right angle Rotation Round Scale factor Sequence Share Significant figure Simplify Solve Square number Sum Tally Term Trapezium Triangle Units Value
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	Half term 2: Place value and proportion Place Value - Recognise the place value of any number in an integer up to one billion - Understand, order and write any number up to one billion in words and figures - Use number lines to work out intervals, and position integers and decimals. - Round integers to the nearest power of ten - Compare two numbers using =, ≠, <, >, ≤, ≥ - Find the range and median of a set of numbers - Round a number to 1 significant figure Write 10, 100, 1000 etc. as powers of ten Write positive integers in the form $A \times 10^n$ Investigate negative powers of ten Write decimals in the form $A \times 10^n$ Fraction, decimal and percentage equivalence - Represent tenths and hundredths as diagrams - Represent tenths and hundredths on number lines - Interchange between fractional and decimal number lines - Convert between fractions and decimals –tenths and hundredths - Convert between fractions and decimals –fifths and quarters - Convert between fractions and decimals –eighths and thousandths - Understand the meaning of percentage using a hundred square	Solve problems with fractions greater than 1 and percentages greater than 100% Half term 2: Directed number and fractional thinking Operations and equations with directed number - Understand and use representations of directed numbers - Order directed numbers using lines and appropriate symbols - Perform calculations that cross zero - Add directed numbers - Subtract directed numbers - Multiplication of directed numbers - Multiplication and division of directed numbers - Use a calculator for directed number calculations - Evaluate algebraic expressions with directed number - Introduction to two-step equations - Solve two-step equations - Use order of operations with directed numbers Roots of positive numbers Explore higher powers and roots Addition and subtraction of fractions - Understand representations of fractions - Convert between mixed numbers and fractions	multiplication and division strategies for integers - Know and use mental arithmetic strategies for decimals and fractions - Use factors to simplify calculations - Use estimation as a method for checking mental calculations - Use known number facts to derive other facts - Use known algebraic facts to derive other facts - Know when to use a mental strategy, formal written method or a calculator Sets and probability - Identify and represent sets - Interpret and create Venn diagrams - Understand and use the intersection and union of sets Understand and use the complement of a set - Know and use the vocabulary of probability - Generate sample spaces for single events - Calculate the probability of a single event - Understand and use the probability scale - Know that the sum of probabilities of all possible outcomes is 1 Prime numbers and proof - Find and use multiples - Identify factors of numbers and expressions - Recognise and identify prime numbers - Recognise square and triangular numbers - Find common factors of a set of numbers including the HCF			
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	▪ Convert fluently between simple fractions, decimals and percentages ▪ Use and interpret pie charts ▪ Represent any fraction as a diagram ▪ Represent fractions on number lines ▪ Identify and use simple equivalent fractions ▪ Understand fractions as division ▪ Convert fluently between fractions, decimals and percentages ▪ Explore fractions above one, decimals and percentages Note: Bold content may only be taught to some classes and will be repeated in other year groups. <i>(R) denotes a review step.</i>	▪ Add and subtract unit fractions with the same denominator ▪ Add and subtract fractions with the same denominator ▪ Add and subtract fractions from integers expressing the answer as a single fraction ▪ Understand and use equivalent fractions ▪ Add and subtract fractions where denominators share a simple common multiple ▪ Add and subtract fractions with any denominator ▪ Add and subtract improper fractions and mixed numbers ▪ Use fractions in algebraic contexts ▪ Use equivalence to add and subtract decimals and fractions ▪ Add and subtract simple algebraic fractions Note: Bold content may only be taught to some classes and will be repeated in other year groups. <i>(R) denotes a review step.</i>	▪ Find common multiples of a set of numbers including the LCM ▪ Write a number as a product of its prime factors ▪ Use a Venn diagram to calculate the HCF and LCM ▪ Make and test conjectures ▪ Use counterexamples to disprove a conjecture Note: Bold content may only be taught to some classes and will be repeated in other year groups. <i>(R) denotes a review step.</i>			
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Year 8 (same as higher)	Half term 1: Proportional Reasoning Ratio and scale - Understand the meaning and representation of ratio - Understand and use ratio notation - Solve problems involving ratios of the form 1:n (or n:1) - Solve proportional problems involving the ratio m:n - Divide a value into a given ratio - Express ratios in their simplest integer form Express ratios in the form 1:n - Compare ratios and related fractions - Understand π as the ratio between diameter and circumference Understand gradient of a line as a ratio Multiplicative change - Solve problems involving direct proportion - Explore conversion graphs - Convert between currencies Explore direct proportion graphs - Explore relationships between similar shapes - Understand scale factors as multiplicative representations - Draw and interpret scale diagrams - Interpret maps using scale factors and ratios Multiplying and dividing fractions - Represent multiplication of fractions - Multiply a fraction by an integer - Find the product of a pair of any fractions - Divide integers or fractions by a fraction - Understand and use the reciprocal Multiply and divide improper	Half term 1: Algebraic techniques Brackets, equations and inequalities - Form algebraic expressions - Use directed number with algebra - Multiply out a single bracket and expand multiple single brackets and simplify - Factorise into a single bracket Expand a pair of binomials - Solve equations, including with brackets - Form and solve equations with brackets - Understand and solve simple inequalities - Form and solve inequalities Solve equations and inequalities with unknowns on both sides Form and solve equations and inequalities with unknowns on both sides - Identify and use formulae, expressions, identities and equations Sequences - Generate a sequence given a rule in words or from given algebraic rules Find the rule for the n^{th} term of a linear sequence Indices - Adding and subtracting expressions with indices - Simplifying algebraic expressions by multiplying and dividing indices	Half term 1: Developing geometry Angles in parallel lines and polygons - Understand and use basic angles rules and notation (R) - Investigate angles between parallel lines and the transversal - Identify and calculate with alternate and corresponding angles - Identify and calculate with co-interior, alternate and corresponding angles - Solve complex problems with parallel line angles - Construct triangles and special quadrilaterals (R) - Investigate the properties of special quadrilaterals - Identify and calculate with sides and angles in special quadrilaterals Understand and use the properties of diagonals of quadrilaterals - Understand and use the sum of exterior angles of any polygon - Calculate and use the sum of the interior angles in any polygon - Calculate missing interior angles in regular polygon Prove simple geometric facts Construct an angle bisector and perpendicular bisector Area of trapezia and circles - Calculate the area of triangles, rectangles and parallelograms (R) - Calculate the area of a trapezium - Investigate the area of a	Times tables Written calculations Order of operations Negative numbers Rounding Estimation Types of number HCF LCM Angle facts Time Area and Perimeter Fraction manipulation Fraction operations Metric units Using algebraic notation Substitution into algebraic expressions/formulae Solving equations Converting between FDP Working with ratio and proportionality Understanding of coordinates	Acute angle Algebra Alternate Angle Area Average Axis Binomial Bisector Brackets Calculate Cartesian Centilitre (cl) Centimetre (cm) Co-interior Continuous Corresponding Cube number Cuboid Decagon Decimal Decrease Denominator Difference Direct Discrete Distance Distributions Divisor Equal Equation Equilateral triangle Estimate Even number Event Expand Expression Exterior Factor Factorise Figures Form Frequency Gradient Gram (g) HCF Heptagon Hexagon Identity Improper fraction	Multiple Multiplier Mutually exclusive Negative Nonagon Numerator Obtuse angle Octagon Odd number Operation Order Outlier Parallel Parallelogram Pentagon Perimeter Perpendicular Polygon Positive number Power Prime Prism Probability Product Proportional Quadrant Quadrilateral Quantitative Questionnaire Quotient Range Ratio Reciprocal Reflex angle Regular Remainder Right angle Rotation Round Sample Sample space Scale factor Sequence Share Significant figure Simplify Solve Square number Standard form Statistical

	and mixed fractions ▪ Multiply and divide algebraic fractions Half term 2: Representations Working in the Cartesian plane ▪ Work with coordinates in all four quadrants ▪ Identify and draw lines that are parallel to the axes ▪ Recognise and use lines of the form $y = x$ and $y = kx$ ▪ Link $y = kx$ to direct proportion problems ▪ Explore the gradient of the line $y = kx$ ▪ Recognise and use lines of the form $y = x + a$ ▪ Explore graphs with negative gradients ▪ Link graphs to sequences ▪ Plot graphs of the form $y = mx + c$ ▪ Explore non-linear graphs ▪ Find the midpoint of a line segment Representing data ▪ Draw and interpret scatter graphs ▪ Understand and describe linear correlation ▪ Draw and use line of best fit ▪ Identify non-linear relationships ▪ Identify different types of data ▪ Read and interpret ungrouped and grouped frequency tables ▪ Represent grouped discrete data and continuous data grouped into equal classes ▪ Represent data in two-way tables Tables and probability ▪ Construct sample spaces for 1 or more events ▪ Find probabilities from a sample space, two-way tables, Venn diagrams	▪ Using the addition and subtraction law for indices ▪ Exploring powers of powers Half term 2: Developing number Fractions and percentages ▪ Convert fluently between key fractions, decimals and percentages (R) ▪ Calculate key fractions, decimals and percentages of amounts without and with a calculator (R) ▪ Convert between decimals and percentages greater than 100% ▪ Calculate percentage increase and decrease using a multiplier ▪ Express one number as a fraction or a percentage of another without a calculator and using calculator methods ▪ Work with percentage change ▪ Choose appropriate methods to solve percentage problems including complex problems ▪ Find the original amount given the percentage is less than 100% or greater than 100% Standard index form ▪ Investigate positive and negative powers of 10 ▪ Work with numbers greater than 1 in standard form ▪ Work with numbers between 0 and 1 in standard form ▪ Compare and order numbers in standard form	circle ▪ Calculate the area of a circle and parts of a circle with and without a calculator ▪ Calculate the perimeter and area of compound shapes Line symmetry and reflection ▪ Recognise line symmetry ▪ Reflect a shape in horizontal, vertical or diagonal line Half term 2: Reasoning with data The data handling cycle ▪ Set up a statistical enquiry ▪ Design and criticize questionnaires ▪ Draw and interpret pictograms, bar charts and vertical line charts (R) ▪ Draw and interpret multiple bar charts ▪ Draw and interpret pie charts (R) ▪ Draw and interpret line graphs ▪ Choose the most appropriate diagram for given set of data ▪ Represent and interpret grouped quantitative data ▪ Find and interpret the range ▪ Compare distributions using charts ▪ Identify misleading graphs Measures of location ▪ Understand and use the mean, median and mode ▪ Choose the most appropriate average ▪ Find the mean form ungrouped and grouped frequency tables ▪ Identify outliers ▪ Compare distributions using averages and range		Increase Independent Index Inequality Integer Interior Inverse Kilogram (Kg) Kilometre (Km) LCM Linear Line segment Litre (l) Mean Median Metre (m) Midpoint Millilitre (ml) Millimetre (mm) Mixed number Mode	Sum Tally Term Transversal Trapezium Triangle Units Value
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	▪ Use the product rule for finding the total number of possible outcomes Note: Bold content may only be taught to some classes and will be repeated in other year groups. (R) denotes a review step.	▪ Mentally calculate with numbers in standard form ▪ Four operations with numbers in standard form ▪ Use a calculator to work with numbers in standard form ▪ Understand and use negative and fractional indices Number sense ▪ Round numbers to powers of 10 and 1 significant figure (R) ▪ Round numbers to a given number of decimal places ▪ Estimate the answer to a calculation ▪ Understand and use error interval notation ▪ Calculate using the order of operations (R) ▪ Calculate with money ▪ Convert metric measures of length, weight and capacity ▪ Convert metric units of area and volume ▪ Solve problems involving time and the calendar Note: Bold content may only be taught to some classes and will be repeated in other year groups. (R) denotes a review step.	Note: Bold content may only be taught to some classes and will be repeated in other year groups. (R) denotes a review step.			
Year 9 (same as higher)	Number ▪ Integers, real and rational numbers ▪ Understand and use surds ▪ Solve worded problems with integers, including all 4 operations ▪ Solve worded problems with decimals including all 4 operations ▪ Solving worded problems with fractions	Forming and solving equations ▪ Solve one and two-step equations and inequalities ▪ Solve one and two-step equations and inequalities with brackets ▪ Inequalities with negative numbers	Enlargement and similarity ▪ Recognise enlargement and similarity ▪ Enlarge a shape by a positive integer scale factor ▪ Enlarge a shape by a positive integer scale factor from a point	Integer Rational Irrational Decimal Surd Square root Evaluate Calculate Product Sum Difference Total	Form Solve Construct Equation Inequality Balance Unknown Variable Equate Inverse Rearrange Subject	Enlarge Similar Centre of enlargement Scale factor Negative Fractional Direct Inverse Proportion Rate Density

	<i>Review objectives to consider:</i> ▪ R - 4 calculations with directed number ▪ R - finding HCF and LCM of a pair of numbers ▪ R - Adding and subtracting fractions (including mixed numbers) ▪ R - Multiplying and dividing fractions (including mixed numbers) ▪ R - Converting numbers between standard form and ordinary. Using Percentages ▪ Find equivalent fractions, decimals and percentages and use in problems ▪ Calculate percentage increase and decrease ▪ Express a change as a percentage ▪ Solve 'reverse' percentage problems ▪ Recognise and solve multistep percentage problems (non-calc) ▪ Recognise and solve multistep percentage problems (calc) ▪ Solve problems with repeated percentage change Maths and Money ▪ Solve problems with bills and bank statements ▪ Calculate simple interest ▪ Calculate compound interest ▪ Solve problems with VAT ▪ Calculate wages and taxes ▪ Solve problems with exchange rates ▪ Solve unit pricing problems	▪ Solve equations with unknowns on both sides ▪ Solve inequalities with unknowns on both sides ▪ Solving equations and inequalities in context ▪ Substituting into formulae and equations ▪ Rearranging formulae (one-step) ▪ Rearranging formulae (two-step) ▪ Rearrange complex formulae including brackets and squares Manipulating Algebra ▪ Recap Expanding single brackets ▪ Expanding single brackets and simplifying ▪ Expanding double brackets and simplifying ▪ Factorising into one bracket ▪ Factorising quadratics of the form $x^2 + bx + c$ Deduction ▪ Angles in parallel lines ▪ Solving angles problems (using chains of reasoning) ▪ Angles problems with algebra ▪ Conjectures with angles ▪ Conjectures with shapes ▪ Link constructions and geometrical reasoning	▪ Enlarge a shape by a positive fractional scale factor ▪ Enlarge a shape by a negative scale factor ▪ Work out missing sides and angles in a pair of given similar shapes ▪ Solve problems with similar triangles ▪ Explore ratios in right-angled triangles Solving ratio and proportion problems ▪ Solve problems with direct proportion ▪ Direct proportion and conversion graphs ▪ Solve problems with inverse proportion ▪ Graphs of inverse relationships (H) ▪ Solve ratio problems given the whole or part ▪ Solve 'best-buy' problems ▪ Solve problems ratio and algebra (H) Rates ▪ Solve speed, distance and time problems without a calculator ▪ Solve speed, distance and time problems with a calculator ▪ Use distance/time graphs ▪ Solve problems with density, mass and volume ▪ Solve flow problems and their graphs ▪ Rates of change and their units ▪ Convert compound units (H)	Fraction Improper Mixed number Numerator Denominator Negative Factor Multiple Common Highest Common Factor Lowest Common Multiple Prime factor Standard form Power Equivalent Simplify Percentage change Reverse percentage Multiplier Solve Compound Simple interest VAT Exchange rate Currency Prism Edges Faces Vertices Net Surface Area Volume Construct Equidistant Bisect Bisector Loci Congruent y-intercept linear gradient equation proportion	Expand Factorise Simplify Collect like terms Quadratic Constant Coefficient Polynomial Angles Parallel Transversal Alternate Corresponding Co-interior Vertically opposite Conjecture Geometrical Order Rotational Symmetry Rotate Translate Vector Transformation Hypotenuse Pythagoras	Mass Volume Probability Frequency Converge Expected Outcome Independent Dependent Interpret Reciprocal
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	3D Shapes - Know names of 2-D and 3-D shapes - Recognise prisms (including language of edges/vertices) - Accurate nets of cuboids and other 3-D shapes - Sketch and recognise nets of cuboids and other 3-D shapes - Plans and elevations - Find area of 2-D shapes - Surface area of cubes and cuboids - Surface area of triangular prisms - Surface area of a cylinder - Volume of cubes and cuboids - Volume of other 3-D shapes – prisms and cylinders (H) Explore volumes of cones, pyramids and spheres Construction and Congruency - Draw and measure angles - Construct and interpret scale drawings - Draw ASA, SAS and SSS triangle - Locus of distance from a point - Locus of distance from a straight line/shape - Locus equidistant from two points - Construct a perpendicular bisector - Construct an angle bisector - Construct a perpendicular from a point and to a point - Locus of distance from two lines - Identify congruent figures - Explore and identify congruent triangles	Rotation and Translation - Identify the order of rotational symmetry of a shape - Compare and contrast rotational symmetry with line symmetry - Rotate a shape about a point on a shape - Rotate a shape about a point not on a shape - Translate points and shapes by a given vector - Compare rotation and reflection of shapes - Find the result of a series of transformations Pythagoras' theorem - Squares and square roots - Identify the hypotenuse of a right-angled triangle - Determine whether a triangle is right angled - Calculate the hypotenuse of a right-angled triangle - Calculate missing sides in right-angled triangles - Use Pythagoras' theorem on coordinate axes - Explore proofs of Pythagoras' theorem - Use Pythagoras' theorem in 3-D shapes	Probability - Single event probability - Relative frequency - include convergence - Expected outcomes - Independent events - Use tree diagrams (H) - Use tree diagrams to solve 'without replacement' problems (H) - Use tree diagrams to work out probabilities (H) Algebraic Representation - Draw and interpret quadratic graphs - Interpret graphs, including reciprocal and piece-wise - Investigate graphs of simultaneous equations (H) - Represent inequalities			
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	Straight line graphs (Aut/Spr) - Draw and recognise lines of the form $y=a$, $x=a$, $y=x$ and $y=-x$ - Filling in and reading table of values - Compare gradients of two lines, in graphical and equation form - Compare intercepts of two lines, in graphical and equation form - Understand and use $y=mx+c$ - Write an equation in the form $y=mx+c$ (H) - Find the equation of a line from a graph - Interpret gradient and intercepts of real-life graphs - Model real-life graphs involving inverse proportion (H) - Explore perpendicular lines (H)					
Year 10	Percentages - Percentage change - Reverse percentages - Compound interest Surface Area and Volume - cubes & cuboids - prisms - cylinders <i>pyramids</i> <i>cones</i> <i>spheres</i> - composite shapes Equations - Equations with unknowns on one side - Equations with unknowns on both sides - Constructing and solving equations <i>Constructing simultaneous equations</i>	Linear Graphs - Drawing linear graphs from a table of values - Finding equations of straight line graphs - Interpreting equations of straight line graphs - Finding the equation of a straight line from its gradient and a point <i>Finding the equation of a straight line from two points</i> <i>Equations of parallel lines</i> Real-life Graphs - Plotting linear real-life graphs - Using and interpreting linear real-life graphs	Sequences - Position-to-term rules for arithmetic sequences - Position-to-term rules for sequences of patterns - Position-to-term rules for geometric sequences Handling data - Sampling and bias Proportion - Solving direct and inverse proportion word problems - Interpreting direct proportion equations <i>Interpreting inverse proportion equations</i> <i>Graphs of direct and inverse proportion</i> Transformations			

	▪ <i>Solving simultaneous equations graphically</i> ▪ <i>Solving simultaneous equations by eliminations</i> ▪ <i>Solving simultaneous equations by substitution</i> Formulae ▪ Changing the subject Trigonometry ▪ Pythagoras' theorem ▪ Understanding sine, cosine and tangent ▪ Finding missing sides of a right-angled triangle ▪ Finding missing angles of a right-angled triangle ▪ Bearings Constructions ▪ Constructing circles ▪ Constructing angles ▪ Constructing bisectors of angles ▪ <i>Construction of perpendicular bisectors and lines</i> ▪ <i>Loci</i>	▪ Finding equations of linear real-life graphs ▪ Sketch graphs of water flow Set notation ▪ Venn diagrams ▪ Writing probabilities as fractions, decimals and percentages ▪ Venn diagrams with set notation ▪ Using set notation Probability Tree Diagrams ▪ Frequency trees ▪ Labelling probability tree diagrams ▪ Calculating probabilities from probability trees for independent events ▪ Calculating probabilities from probability trees for dependent events Compound measures ▪ Converting units ▪ Calculating with density ▪ Calculating with pressure Ratio ▪ Sharing in a given ratio ▪ Converting between ratios, fractions and percentages ▪ Combining ratios ▪ Calculations with ratio and algebra ▪ Changing ratios Graphs ▪ Plotting distance-time graphs ▪ Plotting velocity-time graphs ▪ Plotting quadratic graphs ▪ <i>Plotting cubic graphs</i> ▪ <i>Plotting reciprocal graphs</i>	▪ Translation, reflection and rotation ▪ Enlargement ▪ Combining transformations Rounding ▪ Rounding and Truncation ▪ Error Intervals Indices ▪ Index rules with positive indices ▪ Index rules with negative indices ▪ Simplifying expressions using index laws Brackets ▪ Expanding single brackets ▪ Factorising into single brackets ▪ Expanding double brackets ▪ Factorising quadratic expressions of the form $x^2 + bx + c$ ▪ Factorising the difference of two squares ▪ Factorising to solve quadratic equations of the form $x^2 + bx + c = 0$ Handling data & Statistical diagrams ▪ Finding averages from frequency tables ▪ Interpreting grouped frequency tables ▪ Finding averages from grouped frequency tables ▪ Drawing and interpreting stem and leaf diagrams ▪ Drawing and interpreting line graphs ▪ Drawing and interpreting frequency polygons			
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Year 11	Factors, multiples and primes - Finding the lowest common multiple - Finding the highest common factor - Prime factor decomposition - Using prime factor decomposition to find the HCF and LCM Fractions - Ordering fractions and mixed numbers - Adding and subtracting fractions and mixed numbers - Multiplying and dividing fractions and mixed numbers Expressions - Simplifying expressions using index laws - Simplifying algebraic fractions by cancelling common factors Equations - Solving Equations - Simultaneous Equations Right-angled triangles - Pythagoras' theorem - Trigonometry - Exact Trigonometric Values - Bearings Surface area and volume - Recap of Y10 Surface Area and Volume - Surface area and Volume of Frustums Angles - Combining angle facts - Angles on parallel lines - Angles in polygons Statistical diagrams - Drawing pie charts - Interpreting pie charts - Plotting scatter graphs - Interpreting scatter graphs - Using lines of best fit	Probability - Recap of calculating probabilities - Venn diagrams and set notation - Probability tree diagrams - Sample space diagrams - Mutually exclusive events - Experimental probability Inequalities - Reading and drawing inequalities on number lines - Solving single inequalities - Solving inequalities with the unknown on both sides - Solving double inequalities - Constructing and solving inequalities Vectors - Understanding column vectors - Adding and subtracting column vectors - Multiplying column vectors by a scalar - Identifying parallel vectors - Solving geometric problems involving vectors Percentages - Review of Y10 Percentages Compound measures - Calculations with speed - Calculations with rates - Calculations with density	Bespoke revision plan of content based on each individual class			

		▪ Calculations with pressure Ratio and proportion ▪ Review of ratio ▪ Review of proportion ▪ Currency conversion Standard form ▪ Standard form conversions ▪ Multiplying and dividing numbers in standard form ▪ Adding and subtracting numbers in standard form ▪ Standard form with a calculator Sequences ▪ Review of sequences ▪ Special sequences Linear Graphs Review of Y10 linear graphs				
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GCSE External assessment:

All content is assessed at the end of Year 11. The written examinations are made up of 3 examination papers, two calculator and one non-calculator. Each paper is equally weighted. Each lasts 1 hour 30 minutes and is marked out of 80. Students are awarded grades based on the 9-1 grading system (with 9 being the best grade).

Each examination is available at two tiers. Teachers will use internal class assessments to decide which tier is most appropriate for each student.

Tier	Available Grades
Higher	9-4
Foundation	1-5

SMSC in the mathematics

Through various projects, mini investigations and activities built into lessons, SMSC (Spiritual, Moral, Social and Cultural) is being delivered in high quality lessons.

What we offer:

- A classroom environment which encourages problem solving, collaborative work and enjoyment of exploring real-life problems.
- Participation in extra-curricular activities such as the UK Schools Mathematics Challenges, Maths Enrichment Days, Mathematics Revision Sessions, and Maths Club for students who want to extend themselves and have fun in mathematics

Spiritual development in mathematics

We encourage pupils to see the awe and wonder that can be found within mathematics – from the symmetry of a snowflake or the number of seeds in a sunflower head to the design of galaxies and the coordinates of a newly discovered planet. Pupils are introduced to famous mathematicians, some of whom are also well-known as philosophers. There is a sense of wonder in the exactness of mathematics and students are able to gain a sense of personal achievement in solving problems.

Moral development in mathematics

We look at the use and interpretation of data, particularly the use of statistics and how people manipulate them to promote their own (biased) opinions. Pupils are encouraged to discuss the use

and misuse of data in all issues, including those supporting moral arguments, and consider the use of questionnaires to conduct opinion surveys.

Social development in mathematics

Pupils are regularly asked to work in pairs or small groups during experimental or investigative work where they are able to develop both their problem solving and teamwork skills. They are given many opportunities to discuss their ideas and are encouraged to develop their mathematical reasoning through communication with others. Through the use of peer- assessment pupils are able to improve their use of language and better understand how to give constructive criticism.

Cultural development in mathematics

Students are able to explore the mathematics found and used in other cultures. They are introduced to symmetrical patterns, number systems and mathematical methods such as patterns found in Islamic art and Roman numerals. Students are introduced to the culturally and historically significant art of code-breaking and theorems devised by famous mathematicians.