Programme of Study: Mathematics

KS2 Underpinning Concepts		Year 7	Year 8	Year 9	KS5 & CEIAG Opportunities	Links to SMSC
Number & Place Value • Read, write, order, and compare numbers to 10 million • Use place value to round and count in steps, including powers of 10 • Understand and use negative numbers **Operations** • Develop mental and written methods for all four operations • Recall multiplication tables to 12 × 12 • Solve multi-step problems • Use long multiplication and division **Fractions, Decimals & Percentages** • Compare, order, and calculate with fractions • Understand equivalence between fractions, decimals, and percentages • Work with improper fractions, ratios, and recurring decimals **Measurement** • Use and convert standard units • Calculate perimeter, area, volume, and time • Handle money and time problems **Geometry** • **Shapes**: Identify 2D/3D shapes, symmetry, and angles • **Position & Direction**: Use coordinates, describe movements and rotations **Statistics** • Interpret charts, tables, and graphs • Solve problems using data • Explore mean, median, mode, and range	Autumn 1	**Directed Numbers:** Addition and subtraction with negatives. Multiplication and division with negatives. **Sequences:** Recognise and describe sequences. Continue linear and non-linear sequences. Generate sequences. **Algebraic Proficiency:** Know and use basic algebraic notation. Simplify expressions. Expanding single brackets. Substitution. Functions.	**Sequences:** Generating sequences. Use potion to term rule. Nth Term. Solve sequence problems. **Algebra:** Use algebraic notation. Form equations and expressions. Simplify expressions with indices. Expand brackets. Laws of indices. Substitution including negatives. Rearrange formulae. **Investigating Angles:** Angles in parallel lines. Interior and exterior angles in polygons.	**Sequences:** Generating Fibonacci Sequences. Explore quadratic sequences. Generate and continue quadratic sequences. **Algebra:** Use algebraic vocabulary. Expand double brackets. Factorise quadratics. Form expressions and equations. **Angle Properties:** Solving more complex angle problems. Proof of congruent triangles.	**Academic pathways:** A Level Mathematics, Further Mathematics, and Core Maths build on KS4 learning and develop advanced problem-solving and analytical skills. These qualifications open doors to: **University** courses in STEM, economics, finance, and social sciences **Apprenticeships** in engineering, IT, accountancy, and data analysis **Careers** requiring analytical and decision-making skills Maths is highly transferable, valuable in almost all sectors. **Why Maths Matters** Maths helps us: • Solve problems • Make smart decisions • Work efficiently • Understand the world It's a universal skill used in almost every job. **Career pathways:** **Science & Tech**: Engineers, scientists, programmers **Finance**: Accountants, bankers, economists, analysts **Design & Trades**: Architects, builders, designers **Health**: Doctors, nurses, pharmacists, researchers **Transport & Space**: Pilots, air traffic controllers, astronomer	Mathematics supports pupils' **spiritual, moral, social, and cultural growth**, offering more than just logic and structure. **Spiritual Development** • Inspires awe in patterns and structure • Encourages reflection and resilience • Builds confidence through problem-solving **Moral Development** • Promotes fairness and honesty in data use • Highlights ethical implications of statistics • Encourages respect for different viewpoints **Social Development** • Fosters collaboration and communication • Builds teamwork and shared responsibility • Shows maths in everyday society **Cultural Development** • Celebrates maths as a global language • Recognises diverse contributions to the field • Connects maths to art, architecture, and technology
	Autumn 2	**Angle Properties:** 2D and 3D shapes. Line and rotational symmetry. Properties of quadrilaterals. Angle Rules. Circle parts. Nets. **Rounding and Estimation:** Decimal, significant figure and power of ten rounding. Estimation. **Averages and the Range:** Mode, median, mean and range. Comparing data sets. Averages from a frequency table.	**Negatives:** Extend knowledge of negatives. Square and cube negatives. **Proportional Reasoning:** Direct and inverse proportion. Compound units. **Calculating Space:** Circle properties. Area and circumference of circles. Sectors of circles. Volume of prisms and cylinders.	**Averages:** Reverse mean problems. Quartiles and the interquartile range. **Proportion:** Using multipliers. Conversions. Direct and Inverse Proportion Problems. Compound Measures. Compound measure conversions.		
	Spring 1	**Fractions, Decimals and Percentages:** Inequality symbols. Ordering integers, decimals and fractions. Comparing fractions. Writing fractions and percentages. **Ratio:** Describe ratio. Use scales. Ratio as fractions. Simplifying ratio. Sharing in a ratio **Calculating Space:** Perimeter and area of 2D shapes. Find the area of triangles, rectangles and trapezia. Compound Area. Volume and Surface Area of cuboids.	**Negatives:** Extend knowledge of negatives. Square and cube negatives. **Proportional Reasoning:** Direct and inverse proportion. Compound units. **Calculating Space:** Circle properties. Area and circumference of circles. Sectors of circles. Volume of prisms and cylinders.	**Percentages:** Simple Interest. Compound Interest. **Geometry:** Circle parts. Area of sectors. Arc lengths. Surface area of cylinders.		
	Spring 2	**Number System:** Factors and multiples. HCF and LCM. Square and cube numbers and roots. **Solving Equations:** Inverse operations. Solving one and two step equations. **Converting Units:** Metric units. Converting units for length, mass and capacity.. Convert time. Convert money.	**Probability:** Sample Space diagrams. listing OUTCOMES. Calculating outcomes using theoretical and experimental probability. **Number:** Product of Primes. HCF and LCM. Standard Form. **Solving Equations:** Solving Equations with unknowns on both sides.	**Number:** Writing numbers in standard form. Calculations with roots and indices. Negative indices in context of standard form. Calculations in standard form. Standard form using a calculator. **Presenting Data:** List elements of sets using Venn Diagrams. Listing outcomes systematically. Frequency trees. Theoretical and experimental probability. **Number:** Rounding to a given degree of accuracy. Exploe bounds and solve simple bounds problems.		
	Summer 1	**Probability:** Probability language and scale. Listing outcomes. Probabilities sum to 1. Expected frequency. **Straight Line Graphs:** Plotting coordinates. Coordinate axes problems. Lines parallel to the axes. Completing a table of values.	**Representing Data:** Frequency tables. Frequency Diagrams. Frequency Polygons. Scatter Graphs. **Straight Line Graphs:** Equation of a line y=mx+c. Linear and Quadratic Graphs. **Percentages:** Percentage increase and decrease. Multipliers. Percentage Change.	**Shape:** Surface area of prisms. **Percentages:** Solve problems involving reverse percentages. **Geometry:** Solve problems using Pythagoras' Theorem. Explore an introduction to trigonometry.		
	Summer 2	**Representing Data:** Tally Charts. Frequency Tables. Barcharts. Pie Charts. **Percentages and Fractions:** Adding and subtracting fractions and mixed numbers. Fractions of amounts. Reverse fractions. Basic percentages. Percentage increase and decrease. Multipliers.	**Geometry:** Scale diagrams. Bearings. **Transformations:** Enlargements. Rotations. Reflections. Translations.	**Geometry:** Constructions. Solve simple loci problems. Construct 2D shapes. Construct using plans and elevations. **Algebra:** Solving inequalities. Solving more complex inequalities with unknowns on both sides, including the use of brackets and negatives. Forming inequalities.		

Programme of Study: Mathematics

KS2 Underpinning Concepts		Year 10 Foundation Tier	Year 10 Higher Tier	Year 11 Foundation Tier	Year 11 Higher Tier	KS5 & CEIAG Opportunities	Links to SMSC
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Percentages: conversion **Ratio Unit 1:** Percentages: of amounts, VAT, interest, multipliers **Algebra Unit 2:** Equations and inequalities Sequences **Shape Unit 1:** Properties of shapes, parallel lines and angle facts Interior and exterior angles of polygons **Handling Data Unit 2:** Types of data, Sampling Averages **Shape Unit 2:** Perimeter, area (including compound shapes) and volume (prisms) **Algebra Unit 3:** Real-life graphs Straight-line graphs (plotting, gradients, equations of lines) **Shape Unit 3:** Transformations Ratio Proportion (including currency, direct and inverse)	**Number Unit 1:** Calculations, checking and rounding. Indices, roots, reciprocals and hierarchy of operations. Factors, multiples, primes, standard form and surds. **Algebra Unit 1:** The basics, setting up, rearranging and solving equations. Sequences **Handling Data Unit 1:** Averages and range. Representing and interpreting data and scatter graphs. **Number Unit 2:** Fractions and percentages. **Ratio Unit 1:** Ratio and proportion **Shape Unit 1:** Polygons, angles and parallel lines. Pythagoras' Theorem and trigonometry. **Algebra Unit 2:** Graphs: the basics and real-life graphs. **Algebra Unit 2:** Linear graphs and coordinate geometry. Quadratic, cubic and other graphs. **Shape Unit 2:** Perimeter, area and circles. 3D forms and volume, cylinders, cones and spheres. **Shape Unit 2:** Accuracy and bounds, **Shape Unit 3:** Transformations. Constructions, loci and bearings. **Algebra Unit 3:** Solving quadratic and simultaneous equations. Inequalities. **Probability Unit 1:** Calculating probabilities with sample space diagrams, tree diagrams, Venn diagrams	**Shape Unit 4:** Right-angled triangles: Pythagoras and trigonometry **Probability Unit 1:** Probability (including tree diagrams) **Ratio Unit 3:** Multiplicative reasoning (compound measures, compound interest, reverse percentages) **Shape Unit 5:** Plans and elevations Constructions, loci and bearings **Algebra Unit 4:** Quadratic equations: expanding and factorising Quadratic equations: graphs **Shape Unit 6:** Circles, cylinders, cones and spheres **Number Unit 3:** Fractions and reciprocals Indices and standard form **Shape Unit 7:** Similarity and congruence in 2D Vectors **Algebra Unit 5:** Rearranging equations Graphs of cubic and reciprocal functions Simultaneous equations	**Ratio Unit 2:** Multiplicative Reasoning: direct and inverse proportion, relating to graph form for direct, compound measures, repeated proportional change. **Shape Unit 4:** Similarity and congruence in 2D and 3D. **Shape Unit 5:** Graphs of trigonometric functions. Further trigonometry. **Handling Data Unit 2:** Collecting data. Cumulative frequency, box plots and histograms. **Algebra Unit 4:** Quadratics, expanding more than two brackets, sketching graphs, graphs of circles, cubes and quadratics. **Shape Unit 6:** Circle theorems. Circle geometry. **Algebra Unit 5:** Changing the subject of formulae (more complex), algebraic fractions, solving equations arising from algebraic fractions, proofs. **Number Unit 3:** Rationalising surds. **Shape Unit 7:** Vectors and geometric proof. **Algebra Unit 6**: Vectors and geometric proof. **Ratio Unit 3:** Direct and inverse proportion.	**Academic pathways:** A Level Mathematics, Further Mathematics, and Core Maths build on KS4 learning and develop advanced problem-solving and analytical skills. These qualifications open doors to: **University** courses in STEM, economics, finance, and social sciences **Apprenticeships** in engineering, IT, accountancy, and data analysis **Careers** requiring analytical and decision-making skills Maths is highly transferable, valuable in almost all sectors. **Why Maths Matters** Maths helps us: • Solve problems • Make smart decisions • Work efficiently • Understand the world It's a universal skill used in almost every job. **Career pathways:** **Science & Tech**: Engineers, scientists, programmers **Finance**: Accountants, bankers, economists, analysts **Design & Trades**: Architects, builders, designers **Health**: Doctors, nurses, pharmacists, researchers **Transport & Space**: Pilots, air traffic controllers, astronomer	Mathematics supports pupils' **spiritual, moral, social, and cultural growth**, offering more than just logic and structure. **Spiritual Development** • Inspires awe in patterns and structure • Encourages reflection and resilience • Builds confidence through problem-solving **Moral Development** • Promotes fairness and honesty in data use • Highlights ethical implications of statistics • Encourages respect for different viewpoints **Social Development** • Fosters collaboration and communication • Builds teamwork and shared responsibility • Shows maths in everyday society **Cultural Development** • Celebrates maths as a global language • Recognises diverse contributions to the field • Connects maths to art, architecture, and technology
	Autumn 2						
	Spring 1						
	Spring 2						
	Summer 1						
	Summer 2			**GCSE REVISION AND EXAMINATIONS**			