

Curriculum Map – Maths

What is the aim of the curriculum? How does it demonstrate ambition for students?	The core aim of our Maths Curriculum is to produce confident mathematicians that enjoy the subject and that have the mathematical toolkit to set them up for later life. We have a strong belief that every student is capable of success and achieving well in maths. We aim to support them to do so by delivering ambitious, engaging and well structured lessons that are accessible for all. Our teaching at KS3 and KS4 is underpinned by high expectations, effective assessment, and responsive teaching. Our teachers scaffold their instruction to meet individual learning needs and ensure that all pupils are supported and challenged appropriately. Through the nature of our spiralling curriculum, we have a big focus on retention and accumulation of knowledge over time. Before delivering new material we always recap and review prior knowledge to ensure secure foundations that can be built upon with the introduction of new more complex mathematical techniques. Our curriculum is built around a mastery approach which is designed to ensure that all pupils acquire a deep, secure, and adaptable understanding of mathematical concepts. The mastery model promotes our belief that all pupils are capable of achieving success in mathematics. Our KS3 curriculum is structured so that all pupils move through content at broadly the same pace with opportunities for depth and challenge rather than acceleration. We incorporate extension tasks and problem-solving challenges that require deep understanding to stretch our high attaining students and develop their higher order thinking. For those who require it we use a support curriculum covering the same broad topics where students focus primarily on the key foundational skills of each unit. We do this in order to match the students pace and starting points, reduce cognitive overload and increase their confidence. By focussing on concrete and pictorial examples we aim to equip pupils with a deep understanding of mathematical concepts and give them the confidence to apply these skills in a range of contexts. Our most able students are entered for the UKMT Maths Challenge to give them chance for national recognition whilst developing their numerical fluency and lateral thinking skills. We deliver the whole National Curriculum for Maths at Key Stage 3. In KS4 we aim to ensure that all of our students have developed the numeracy skills necessary for life and work, including financial literacy, estimation, and data interpretation. We aim to foster a confidence, enjoyment and positive attitude towards mathematics to provide our students with a resilience and confidence towards mathematical tasks in later life. By fostering a mathematical enjoyment and curiosity we hope to inspire a good proportion of our students to go on to study Mathematics beyond KS4. Taking this into account we aim to set our students up with strong foundations for post-16 mathematics be that A-levels, vocational qualifications or apprenticeships. To further set our students up for post 16 mathematics we deliver a Level 2 Further Maths Qualification which bridges the gap to A-Level and extends their knowledge beyond the standard KS4 maths curriculum. In delivery of Further Maths we aim to set students up with the independent study skills necessary to excel in further education at KS5 and beyond. At KS4 we aim to set our students up with the mathematical skills, reasoning ability and knowledge base for success in their Mathematics GCSE. We recognise that a good mathematics GCSE is integral in giving our students the best possible options for their next steps so put this high in terms of our aims. To best support our students confidence in KS4 maths we have a two-tiered curriculum, higher and foundation. By treating each student as an individual and using data to build a long-term picture of each students mathematical progress, we carefully decide the most suitable tier for students to thrive in. Regardless of tier, our curriculum in KS4 interleaves topics together, by doing this we aim to give our students a broader picture of how maths is interconnected and for them to make deeper connections between concepts. We recognise that in real life problems are not sorted by topic and so aim to develop our students decision-making skills that they can then apply to any problem. We integrate a variety of problem solving questions into our curriculum and aim to increase students perseverance and ability to break down problems into small steps. An important factor we consider when developing our curriculum is literacy and oracy. In every lesson teachers plan for explicit teaching of tier 3 vocabulary through word of the lesson and model the use of this language throughout. Also students have the opportunity to explain their mathematical thinking and reasoning, developing their oracy skills and overall confidence in maths.
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How does the curriculum allow time for teaching, practicing and revisiting content and for addressing gaps in student knowledge as quickly as possible?	Our curriculum is built with two main ethos's. The first ethos is building student confidence, we aim to do this by creating a learning environment in which every student feels supported and able to achieve. The curriculum is carefully sequenced so that concepts build logically over time and ensure new concepts are introduced in manageable steps. When introducing new topics we first revisit students prior knowledge so students have the secure foundations and confidence to be able to take on new information. To help students confidence our curriculum time is allocated proportionally to the complexity and importance of topics, for example we recognise that strong foundations in algebra are essential for students progression into KS4 and so we dedicate 4 weeks in Year 8 to the key algebraic techniques such as solving equations, expanding brackets and substitution. Our second ethos is 'Retention' in which we ultimately aim for students to build their knowledge over time and commit their learning to their long term memory. We recognise the significance of Ebbinghaus' forgetting curve and the potential for new learning to be forgotten very quickly if we do not give opportunity for retrieval practice and so revisiting topics and giving opportunity for recall practice is at the forefront of what we do. Every lesson we deliver begins with an opportunity for students to have retrieval practice in the form of tailored starters for each group. These starters focus on previous learning and are adapted to address students' individual next steps, reinforce prior knowledge and support long-term retention. We design the starters to include recently covered topics which we know are more likely to be forgotten if not revisited soon after teaching, we also incorporate literacy based questions where students develop their inference skills and a challenge question designed to ensure every student in the class is mathematically pushed. We structure our lessons to include plenaries often asking students to apply the lessons concept to a real-world scenario or exam-style question. These plenaries give students an opportunity to practice new skills in a different context, which strengthens schema and aids consolidation of knowledge. They serve as a form of formative assessment, giving our teachers instant feedback on how well students have understood the material. This enables swift intervention and informs future lessons teaching to ensure misconceptions are not left unresolved. We conduct low-stakes quizzes and use formative assessments techniques to provide timely feedback and pinpoint misconceptions early. This allows teachers to address learning gaps promptly, ensuring students are secure in their understanding before progressing. Additionally, each unit of learning concludes with a small summative assessment used for close tracking of student performance. Before moving to the next unit of learning we ensure student next steps and misconceptions from the previous unit are addressed in the form of a student feedback lesson. We use a spiralling curriculum design to revisit and build upon prior learning across multiple units and key stages. This approach ensures that key concepts are not just taught once but are re-encountered several times, strengthening mathematical understanding and aiding transfer to long-term memory. We carefully plan and build homework tasks into our curriculum to give students another chance to practice and revisit content we have covered. Homework tasks are deliberately scheduled to align with the forgetting curve. We set out to recap content around two weeks after initial teaching at the point when students are most likely to begin forgetting if not given opportunity for retrieval practice. This strategic spacing enhances retention and recall. Finally, question level analysis (QLA) of formal assessments that students complete bi-annually enable precise identification of each student's strengths and areas for development. These insights are then used to inform subsequent planning, allowing for targeted intervention and personalised next steps, aiming to ensure that no student is left behind.
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How is the curriculum designed to build students' knowledge and skills cumulatively? How does it pave the way for future learning?	Our maths curriculum is designed to build students' knowledge and skills cumulatively by following a carefully sequenced structure where each topic builds on prior learning and prepares the foundation for more complex concepts. Key knowledge is introduced, revisited, and deepened over time, allowing students to develop a strong conceptual understanding alongside procedural fluency. As previously discussed to achieve this we: • Use a spiralled curriculum design, where key concepts (e.g. number, algebra, geometry) are revisited in increasing depth and complexity. • Deliberately sequence our curriculum, ensuring foundational topics (like place value or fractions) are mastered before introducing higher-level applications (like algebraic fractions or proportional reasoning). • Ensure interleaving and retrieval practice are central to what we do, reinforcing prior learning and connecting new knowledge to existing understanding. • Use regular formative assessment, identifying gaps in knowledge early and using timely intervention to address student next steps. To pave the way for future learning we establish key concepts early. Our Year 7 curriculum is designed to secure the key foundations of maths (e.g. place value, operations, fractions) that underpin all later learning. In teaching of our lessons we use scaffolding and modelling to deepen understanding before gradually increasing independence.
How does the curriculum highlight progression routes for the subject and future career paths (Gatsby Benchmark 4)	Through our curriculum we aim to highlight the role that mathematics plays in every day life no matter what career paths our students may take. In our lessons we use examples that demonstrate how maths is used in real jobs (for example: the use of standard form in astronomy, the use of proportion as a chef or builder and the use of percentages in the financial sector', We recognise that calculating with money will play such an integral role in all of our students adult lives and so focus an entire unit of learning in Year 9 on 'Maths and Money'. Here students learn about bank statements, interest rates, tax calculations, best buy calculations and currency exchange rates. As a department we look for opportunities to show maths outside of the classroom through extra curricular trips, these have included an aspirational trip to UEA, a maths trip to Norwich castle and a visit to the academy from an external business link to show how maths is applied in a business setting. We know that maths has a lot of transferable skills which are valued across a wide breadth of careers including fields that are not traditionally considered 'maths heavy'. Therefore we aim to teach and emphasise how skills like problem-solving, logical reasoning and precision can be applied to any job role. We express to our students the relevance of perseverance, critical thinking, and pattern recognition in any career path. We teach Level 2 Further Maths to our high achieving KS4 students. We recognise it offers a powerful opportunity to highlight academic and professional progression routes and raise the students aspirations whilst serving as a stepping stone to A-Level Maths and Further Maths. When teaching this qualification, we use shared terminology and notation with A-Level Maths to build familiarity. We highlight how mastering the topics taught in the further maths qualification will makes the transition to KS5 maths smoother. By exposing our students to higher-level content earlier we aim to improve their mathematical literacy, problem-solving, and academic resilience, which are highly sought-after qualities for university and professions in the STEM field. We teach GCSE Statistics to students with a strong interest in mathematics and data. The qualification gives them opportunities to collect, analyse and interpret real data, and to judge how statistics are used in the news, research and everyday decisions. We highlight links to A-Level Maths and subjects such as science and business, where interpreting data is an important skill. By studying statistics in greater depth, students develop their mathematical literacy, critical thinking and confidence in explaining conclusions—skills that support further study and a wide range of careers.

	Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What will be taught?	7	<u>Algebra:</u> Sequences <u>Algebra:</u> Understand and use algebraic notation <u>Algebra</u> Expressions and Equations	<u>Number:</u> Place value and ordering and rounding <u>Number:</u> Four Operations <u>Statistics</u> Averages and the range <u>Number</u> Rounding and Estimation	<u>Statistics:</u> Graphing Data <u>Number:</u> Fractions, Decimals and Percentages	<u>Number:</u> Directed Number <u>Number:</u> Fractions and Percentages of Amounts <u>Geometry and Measures</u> Area and Perimeter	<u>Number:</u> Speed, Distance, Time <u>Number:</u> Properties of Numbers	<u>Number:</u> Add and Subtract Fractions <u>Geometry and Measures</u> Angles and Polygons
	8	<u>Ratio and Proportion:</u> Ratio <u>Ratio and Proportion:</u> Proportion and Scale <u>Ratio and Proportion:</u> Algebraic Manipulation	<u>Algebra & Representations:</u> Coordinates and Graphs <u>Number:</u> Multiply and Divide Fractions <u>Geometry and Measures</u> Symmetry and Reflection	<u>Geometry and Measures</u> Area, Volume and Density <u>Algebra:</u> Equations and Inequalities <u>Number:</u> Percentages	<u>Algebra:</u> Indices <u>Number:</u> Standard Form <u>Statistics:</u> Interpret and Represent Data	<u>Geometry & Measures</u> Angles in Parallel Lines and Polygons <u>Probability:</u> Tables and Probability	<u>Geometry and Measures:</u> Circles <u>Statistics:</u> Measures of Location <u>Algebra:</u> Sequences
	9	<u>Number:</u> Properties of Number <u>Number:</u> Percentages <u>Geometry and Measures:</u> Area and Volume	<u>Algebra:</u> Equations, Inequalities and Formulae <u>Number:</u> Fractions <u>Ratio and Proportion:</u> Rates <u>Number:</u> Standard Form	<u>Number:</u> Maths and Money <u>Algebra and Representations:</u> Straight Line Graphs <u>Ratio and Proportion:</u> Ratio and Proportion	<u>Geometry and Measures:</u> Constructions and Congruency <u>Geometry and Measures:</u> Similarity <u>Algebra:</u> Algebraic Manipulation	<u>Geometry and Measures:</u> Pythagoras' Theorem <u>Algebra:</u> Non- Linear Graphs <u>Probability:</u> Sets and Probability	<u>Geometry and Measures:</u> Transformations <u>Geometry and Measures:</u> Trigonometry <u>Algebra:</u> Simultaneous Equations
	10	<u>Algebra</u> Algebraic Manipulation <u>Algebra :</u> Equations, Inequalities and Formulae <u>Algebra:</u> Quadratic Expressions and Equations	<u>Number:</u> Percentages <u>Ratio and Proportion:</u> Ratio and Scale <u>Number:</u> Work with Fractions	<u>Number:</u> Non-Calculator Methods <u>Algebra:</u> Straight Line Graphs <u>Probability:</u> Probability	<u>Geometry and Measure:</u> Perimeter, Area and Volume <u>Statistics:</u> Interpret and Represent Data <u>Algebra:</u> Non-Linear Graphs	<u>Geometry and Measures:</u> Angles <u>Statistics:</u> Graph and Diagrams <u>Geometry and Measures:</u> Vectors	<u>Number:</u> Types of Numbers and Sequences <u>Number:</u> Indices and Roots <u>Number:</u> Manipulating Expressions

	Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
				Number: Rounding and Estimation			
	11 Higher	Graphs: Gradients and Lines Graphs: Non-Linear Graphs Graphs: Using Real Life Graphs	Algebra: Expanding and Factorising Algebra: Changing the Subject of a Formula Algebra: Functions	Ratio and Proportion: Calculations with Direct and Inverse Proportion Geometry: Revision of Angles, Vectors and Circle Theorems Algebra: Revision of Nth Term, Inequalities and Simultaneous Equations	Geometry: Revision of Transformations and Constructions Representations: Revision of Probability and Expectation Revision: Teacher Led revision of Student Next Steps and Weaknesses		
	11 Foundation	Number: Percentages and FDP Equivalence Number: Percentage Change and Interest Representation: Types of Graphs and Charts	Geometry: Accurate Constructions Geometry: Area of 2D shapes and Volume of 3D shapes Algebra: Sequences and Nth Term	Geometry: Right-Angled Triangles, Pythagoras' and Trigonometry Geometry: Enlargements, Similarity and Congruence	Probability: Different way to represent probabilities Number: Laws of Indices and Standard Form Algebra: Simultaneous Equations and Quadratics	Revision: Teacher Led revision of Student Next Steps and Weaknesses	

What key threshold concepts /core skills / themes are covered each half term?	7	Sequences Describe and continue sequences Find the next term(s) Linear and non-linear sequences Continue linear sequences Continue non-linear sequences Term-to-term rules Find missing terms Understand and use Algebraic Notation Understand and use 1-step function machines (numerical and algebraic) Find a function (one step) Use algebraic substitution in mathematical formulae Understand and calculate with 2 step – functions machines (numerical and algebraic) Expressions and Equations Equality and equivalence Related facts Like and unlike terms Collect like terms Solve 1-step equations (+/-) Solve 1-step equations ($\times/\div$) Solve 2-step equations	Place value and ordering and rounding Write integers in numerals and words Intervals on a number line Compare and order integers Place value for decimals Decimals on a number line Compare and order decimals Round to powers of 10 Round to the nearest integer Round to decimal places Powers of 10 (E) Numbers greater than 1 in standard form (E) Negative powers of 10 (E) Numbers between 0 and 1 in standard form (E) Four Operations Add and subtract integers Add and subtract decimals Multiply and divide by 10, 100 and 1000 Multiply by 0.1 and 0.01 (E) Multiply integers Divide integers Multiply decimals Divide decimals by integers Divide by a decimal (E) Order of operations Averages and the range Mode Mean Median Range Solve problems with averages and range Rounding and Estimation Round to 1 significant figure Round to 2 or more significant figures Estimate answers to calculations Solve problems with estimation	Graphing Data Pictograms Bar charts Dual bar charts Composite bar charts Coordinates in the first quadrant Scatter graphs Correlation Lines of best fit Time series graphs Non-linear relationships Fractions, Decimals and Percentages Represent tenths and hundredths Number lines with fractions and decimals Tenths, hundredths, fifths and quarters Eighths and thousandths Understand percentages Convert simple fractions, decimals and percentages Fractions as diagrams Fractions on a number line Equivalent fractions Compare and order fractions Fractions as division Convert fractions, decimals and percentages Fractions, decimals and percentages greater than 1 (E)	Directed Number Directed number and number lines Compare and order directed numbers Calculations that cross zero Directed number and zero pairs Add directed numbers Subtract directed numbers Multiply and divide directed numbers Order of operations with directed numbers Use a calculator with directed numbers Fractions and Percentages of Amounts Fraction of an amount Use a fraction to find the whole Percentage of an amount (non-calculator) Percentage of an amount (calculator) Percentage increase and decrease Use a percentage to find the whole (E) Solve problems with fractions and percentages greater than 1 (E) Area and Perimeter Convert metric units of length Perimeter of a polygon Perimeter of a compound shape Area of rectangles and parallelograms Area of a triangle Area of a trapezium Solve problems with perimeter and area Form expressions with perimeter and area (E)	Speed, Distance, Time Convert between milliseconds, seconds, minutes and hours Convert between hours, days and years Solve problems with tables and timetables Solve problems with time and the calendar Calculate speed Calculate time and distance Solve problems with speed, distance and time Interpret distance-time graphs Draw distance-time graphs Calculate speed from a distance-time graph (E) Properties of Numbers Multiples Factors Prime numbers Write a number as a product of prime factors Square, cube and triangular numbers Square roots and cube roots Explore higher powers and roots (E) Highest common factor (HCF) Lowest common multiple (LCM) HCF and LCM from a Venn diagram (E) Use factors to simplify calculations (E)	Add and Subtract Fractions Simplify fractions Convert between mixed numbers and improper fractions Add and subtract fractions with the same denominator Add and subtract with fractions and integers 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 equivalence to add and subtract decimals and fractions (E) Add and subtract simple algebraic fractions (E) Substitution and solving equations with fractions (E) Angles and Polygons Draw and measure line segments and angles Understand and use geometric notation Angles around a point Angles on a straight line Vertically opposite angles Recognise and name polygons Angles in a triangle Angles in a quadrilateral Solve problems with angles Parallel and perpendicular lines Investigate angles in parallel lines (E) Angles in any polygon (E) Simple proofs (E)

			Understand and use error interval notation (E)				
8	Ratio Understand ratio Ratio problems (whole given) Ratio problems (part given) Ratio problems (difference given) Simplify ratios Express ratios in the form 1:n and n:1 (E) Compare ratios and fractions Solve problems with ratio Proportion and Scale Direct proportion Conversion graphs Convert between currencies Direct proportion graphs Similar shapes Convert metric units Scale diagrams Interpret maps using scale and ratios Algebraic Manipulation Form algebraic expressions Identify and use formulae, expressions, identities and equations Simplify expressions Use directed number with algebra Substitution with directed number Expand a single bracket Factorise into a single bracket Expand single brackets and simplify Expand double brackets (E) Factorise quadratic expressions (E)	Coordinates and Graphs Coordinates in all four quadrants Lines parallel to the axes Table of values Recognise and use the line $y = x$ Lines of the form $y = mx$ Link $y = mx$ to direct proportion (E) Introduce gradient ($y = mx$) Lines with a negative gradient Lines of the form $y = x + c$ Lines of the form $y = mx + c$ Find the midpoint of a line segment (E) Solve problems with coordinates and graphs (E) Quadratic graphs (E) Multiply and Divide Fractions Multiply a fraction by an integer Multiply fractions Understand reciprocals Divide an integer by a fraction Divide a fraction by an integer Divide a fraction by a unit fraction Divide fractions Multiply and divide mixed numbers Multiply and divide algebraic fractions (E) Symmetry and Reflection Line symmetry Rotational symmetry Reflect a shape in a horizontal or vertical line Reflect a shape in a diagonal line Reflect a shape given the equation of a line (E) Describe a reflection (E)	Area, Volume and Density Name 2-D and 3-D shapes Area of a 2-D shape Area of a compound shape Recognise prisms Volume of cubes and cuboids Convert metric units of mass and capacity Understand the units of density, mass and volume Solve problems with density, mass and volume Equations and Inequalities Solve simple 1- and 2-step equations Solve more complex equations Solve fractional equations Form and solve equations Solve equations with unknowns on both sides Understand and use inequalities Inequalities on a number line Solve inequalities Form and solve inequalities Solve inequalities with unknowns on both sides (E) Percentages Percentage of an amount Convert between percentages and decimals Use multipliers to calculate percentages Convert between percentages and decimals greater than 1 Percentage increase using a multiplier Percentage decrease using a multiplier Percentage increase and decrease using a multiplier Express one number as a fraction or a percentage of another (non-calculator)	Indices Add and subtract expressions with indices Multiply and divide expressions with indices Addition law for indices Subtraction law for indices Addition and subtraction laws for indices Powers of powers (E) Negative indices (E) Fractional indices (E) Standard Form Positive and negative powers of 10 Numbers greater than 1 in standard form Numbers between 0 and 1 in standard form Standard form on a calculator Interpret and Represent Data Types of data Averages and range Outliers and errors Choose the most appropriate average Compare distributions using average and the range Averages from an ungrouped frequency table Represent and interpret grouped discrete data Represent and interpret continuous data grouped into equal classes Mean and mode from a grouped frequency table (E)	Angles in Parallel Lines and Polygons Basic angle rules and notation Angles in parallel lines Alternate and corresponding angles Alternate, corresponding and co-interior angles Solve problems with angles in parallel lines Properties of special quadrilaterals and their diagonals Find unknown lengths and angles in special quadrilaterals Exterior angles of a polygon Interior angles of a polygon Interior angles of a regular polygon Prove simple geometric facts (E) Tables and Probability Probability vocabulary The probability scale Probability of a single event Use the property that probabilities sum to 1 Probability experiments Sample spaces for one or more events Probabilities from sample space diagrams Two-way tables Probabilities from two-way tables Frequency trees Probabilities from frequency trees	Circles Circle vocabulary Pi as a ratio Circumference of a circle Perimeter of parts of a circle Area of a circle Area of parts of a circle Area and circumference of a circle Perimeter of a compound shape with circles Perimeter and area of compound shapes with circles Graphs and Charts Pictograms and bar charts Vertical line charts Draw pie charts Interpret pie charts Line graphs Choose the most appropriate graph or chart Compare distributions using graphs Misleading graphs and charts Sequences Generate and describe a sequence given a rule in words Generate a sequence given a simple algebraic rule nth term of a linear sequence Generate a sequence given a complex algebraic rule (E)	

				Express one number as a fraction or a percentage of another (calculator) Percentage change Find the original value given a percentage Choose appropriate methods to solve percentage problems			
9	Properties of Number Factors, multiples and primes Write a number as a product of prime factors Use prime factors (E) Highest common factor (HCF) and lowest common multiple (LCM) Venn diagrams Use a Venn diagram to calculate HCF and LCM Integers, real numbers and rational numbers Introduction to surds (E) Percentages Percentage increase and decrease Express a change as a percentage Find the original value after a percentage change Solve problems with percentages (non-calculator) Solve problems with percentages (calculator) Repeated percentage change Understand interest Simple interest Compound interest Area and Volume Nets Area of a 2-D shape Area and circumference of a circle Surface area of cubes and cuboids Surface area of a triangular prism (E) Surface area of a cylinder (E)	Equations, Inequalities and Formulae Solve equations and inequalities Solve equations and inequalities with brackets Inequalities with negative numbers (E) Solve equations and inequalities with unknowns on both sides Solve problems with equations and inequalities Substitute into formulae and equations Change the subject of a formula (one-step) Change the subject of a formula (two-step) Change the subject of a complex formula (E) Fractions Add and subtract fractions Multiply and divide fractions Fraction of an amount Rates Speed, distance and time Distance-time graphs Flow problems and their graphs Rates of change and their units Convert compound units (E) Standard Form Numbers in standard form Compare and order numbers in standard form Multiply and divide numbers	Maths and Money Understand a bank account Value Added Tax (VAT) Ways to pay Ways to save Jobs and pay Investments Borrowing (buying a house) Running a house or a business Budgeting Borrowing (loans) Spending overseas Insurance Straight Line Graphs Lines parallel to the axes, $y = x$ and $y = -x$ Explore gradients Explore intercepts $y = mx + c$ Rearrange equations to the form $y = mx + c$(E) Find the equation of a line from a graph Interpret gradients and intercepts of real-life graphs Graph inequalities (E) Ratio and Proportion Direct proportion Direct proportion and conversion graphs Inverse proportion Inverse proportion graphs (E) Ratio problems (whole or a part given) Solve problems with ratio and algebra (E)	Constructions and Congruency Draw and measure angles Accurately draw triangles using ASA and SAS Accurately draw triangles using SSS Construct an angle bisector Construct a perpendicular bisector Construct a perpendicular from or to a point Accurately draw more complex polygons Identify congruent shapes Congruent triangles Similarity Recognise enlargement and similarity Work out unknown lengths and angles in similar shapes Solve problems with similar triangles (E) Ratio in right-angled triangles (E) Algebraic Manipulation Expand single brackets and simplify Factorise into a single bracket Expand double brackets Expand more complex double brackets Use identities Factorise quadratic expressions Solve quadratic equations (E) Expand triple brackets (E)	Pythagoras' Theorem Solve equations with squares and square roots Identify the hypotenuse Determine whether a triangle is right-angled Pythagoras' theorem (find the hypotenuse) Pythagoras' theorem (find any side) Use Pythagoras' theorem on coordinate axes Proofs of Pythagoras' theorem (E) Pythagoras' theorem in 3-D shapes (E) Non- Linear Graphs Substitute into quadratic expressions Draw quadratic graphs Draw more complex quadratic graphs Interpret quadratic graphs Reciprocal and exponential graphs Draw cubic graphs (E) Interpret cubic graphs (E) Interpret roots, intercepts and turning points (E) Sets and Probability Identify and represent sets Intersection of sets Union of sets Complement of a set (E) Probability of a single event Use diagrams to work out probabilities Relative frequency Expected outcomes	Transformations Enlargement (positive scale factor) Enlargement from a point (positive scale factor) Enlargement (fractional scale factor) Enlargement (negative scale factor) (E) Describe an enlargement Rotation about a point Describe a rotation Translation Describe a translation Reflection Find the result of a series of transformations (E) Simultaneous Equations Use one value to find another Introduction to simultaneous equations Solve simultaneous equations using graphs Solve simultaneous equations (no adjustments) Manipulating equations Solve simultaneous equations (adjust one) Solve simultaneous equations (adjust both) (E) Solve simultaneous equations by substitution (E) Trigonometry Identify the hypotenuse, opposite and adjacent sides Use the tangent ratio to find unknown side lengths Use sine and cosine ratios to find unknown side lengths	

		Volume of a prism Volume of a cylinder Volume of cones, pyramids and spheres (E) Convert metric units of area and volume (E)	in standard form Add and subtract numbers in standard form			Independent events Probabilities from Venn diagrams	Use sine, cosine and tangent ratios to find unknown angles Choose appropriate methods to solve problems with right-angled triangles Key angles in right-angled triangles (E) Trigonometry in 3-D shapes (E)
10 Higher	<u>Algebraic Manipulation</u> Simplify expressions Laws of indices Expand a single bracket Factorise into a single bracket <u>Equations, Inequalities and Formulae</u> Solve equations Solve fractional equations Solve equations with unknowns on both sides Understand inequalities Solve inequalities Represent solutions to inequalities using set notation (E) Change the subject of a simple formula Change the subject of a known formula Change the subject of a complex formula Change the subject of a formula where the subject appears more than once (E) <u>Quadratic Expressions and Equations</u> Expand double brackets Expand triple brackets Factorise quadratic expressions Factorise more complex quadratic expressions (E) Difference of two squares Solve quadratic equations equal to 0 Solve quadratic equations by factorisation	<u>Percentages</u> Percentage of an amount Percentage increase and decrease Repeated percentage change Express one number as a fraction or percentage of another Express a change as a percentage Find the original value after a percentage change Simple interest Compound interest Choose appropriate methods to solve percentage problems <u>Ratio and Scale</u> Equivalent ratios Share in a ratio (whole, part or difference given) Link ratios and fractions Combine a set of ratios Share in a ratio (algebraically) Solve problems with ratio and algebra Ratios and scales <u>Work with Fractions</u> Add and subtract fractions Multiply and divide fractions Solve problems with fractions Add and subtract algebraic fractions Multiply algebraic fractions Divide algebraic fractions Simplify algebraic fractions by factorising Add and subtract more complex algebraic fractions (E)	<u>Non-Calculator Methods</u> Order of operations Related calculations Solve multi-step problems Convert recurring decimals to fractions Convert more complex recurring decimals to fractions <u>Straight Line Graphs</u> Draw straight line graphs $y = mx + c$ Find the equation of a line from a graph Represent solutions to single inequalities on a graph Represent solutions to multiple inequalities on a graph (E) Find the midpoint of a line segment Equation of a straight line graph given one point and a gradient Equation of a straight line graph given two points Equations of perpendicular lines (E) Real-life straight-line graphs <u>Probability</u> Probability of a single event Use the property that probabilities sum to 1 List and count outcomes Relative frequency Sample spaces for one or more events Two-way tables and frequency trees	<u>Perimeter, Area and Volume</u> Perimeter of a 2-D shape Area of a 2-D shape Area and circumference of a circle Arc length and perimeter Area of a sector Volume of a prism Volume of a cylinder Nets Surface area of a prism Surface area of a cylinder <u>Interpret and Represent Data</u> Averages and range Averages from an ungrouped frequency table Mean from a grouped frequency table Averages from a grouped frequency table Use data to compare distributions Types of data Sampling Capture and recapture Scatter graphs <u>Non-Linear Graphs</u> Quadratic graphs Intercepts and roots of quadratic graphs Turning points Cubic graphs Approximate solutions to equations using graphs Estimate the gradient of a curve at a given point Estimate the area under a curve (E)	<u>Angles</u> Angles around a point, on a straight line and vertically opposite Angles in triangles and quadrilaterals Exterior angles of a polygon Interior angles of a polygon Solve problems with angles in polygons Co-interior, alternate and corresponding angles Solve problems with angles and algebra Prove geometric facts (E) <u>Graph and Diagrams</u> Pie charts Time series graphs Frequency polygons Draw histograms Interpret histograms Draw cumulative frequency diagrams Interpret cumulative frequency diagrams Box plots Compare distributions using box plots (E) <u>Vectors</u> Understand and represent vectors Vector notation Vectors multiplied by a scalar Add vectors Add and subtract vectors Vector journeys in shapes Vectors in quadrilaterals Parallel vectors	<u>Factors, Powers and Surds</u> Prime factorisation, HCF and LCM Powers, roots and negative indices Fractional indices Four operations with surds Simplify surds Expand single brackets with surds Rationalise the denominator Expand double brackets with surds Rationalise the denominator with more complex denominators (E) Solve problems with surds <u>Pythagoras' Theorem and Trigonometry</u> Pythagoras' theorem (find any side) Use trigonometric ratios to find an unknown side length Use trigonometric ratios to find an unknown angle Exact trigonometric values Trigonometry in 3-D shapes Area of a non-right-angled triangle Use the sine rule to find an unknown side length Use the sine rule to find an unknown angle Use the cosine rule to find an unknown side length Use the cosine rule to find an unknown angle	

		Solve more complex quadratic equations by factorisation (E) Complete the square Complete the square with more complex quadratic expressions (E) Solve quadratic equations by completing the square (E) Solve quadratic equations using the quadratic formula	Multiply and divide more complex algebraic fractions (E) Solve equations with algebraic fractions (E)	Independent events Tree diagrams for independent events Tree diagrams for dependent events Rounding and Estimation Round to decimal places and significant figures Estimate answers to calculations Use of a calculator Error intervals (including truncation) Upper and lower bounds	Equation of a circle Equation of a tangent to a circle (E)		Simultaneous Equations Solve simultaneous equations using graphs Solve simultaneous equations (no adjustments) Solve simultaneous equations (adjust one) Solve simultaneous equations (adjust both) Solve simultaneous equations by substitution Solve problems with simultaneous equations Solve simultaneous equations (one linear, one non-linear) using graphs (E) Solve simultaneous equations (one linear, one non-linear) by equating expressions (E) Solve simultaneous equations (one linear, one non-linear) using substitution (E)
10 Foundati on	Algebraic Manipulation Substitution Collect like terms Simplify expressions Addition and subtraction laws for indices Powers of powers Expand a single bracket Factorise into a single bracket Equations, Inequalities and Formulae Solve equations Solve fractional equations Solve equations with unknowns on both sides Understand inequalities Solve inequalities Change the subject of a simple formula Change the subject of a known formula Change the subject of a complex formula (E) Quadratic Expressions and Equations	Percentages Percentage of an amount Percentage increase and decrease Repeated percentage change (E) Express one number as a fraction or percentage of another Express a change as a percentage Find the original value after a percentage change Simple interest Compound interest (E) Choose appropriate methods to solve percentage problems Ratio and Scale Equivalent ratios Share in a ratio (whole given) Share in a ratio (part or difference given) Link ratios and fractions Combine a set of ratios (E) Ratios and scales	Non-Calculator Methods Place value for integers and decimals Compare and order numbers Add and subtract integers and decimals Multiply and divide integers and decimals Four operations with directed numbers Order of operations Related calculations Solve multi-step problems Straight Line Graphs Draw straight line graphs Find solutions to equations using straight line graphs Explore gradients $y = mx + c$ Find the equation of a line from a graph (E) Find the midpoint of a line segment Equation of a straight line graph given one point and a gradient	Rounding and Estimation Round to decimal places Round to significant figures Estimate answers to calculations Use of a calculator Error intervals (including truncation) Perimeter, Area and Volume Name 2-D and 3-D shapes Perimeter of a 2-D shape Area of a 2-D shape Area of a compound shape Recognise and label parts of a circle Circumference of a circle Area of a circle Volume of a prism Nets Surface area of a prism Interpret and Represent Data Averages and range Averages from an ungrouped frequency table Mean from a grouped	Angles Angles around a point, on a straight line and vertically opposite Angles in a triangle Angles in a quadrilateral Exterior angles of a polygon Interior angles of a polygon Solve problems with angles in polygons (E) Alternate and corresponding angles Alternate, corresponding and co-interior angles Prove geometric facts (E) Graph and Diagrams Pictograms Vertical line and bar charts Dual and composite bar charts Draw pie charts Interpret pie charts Time series graphs Frequency polygons Vectors	Factors and Powers Factors, multiples and primes Prime factorisation HCF and LCM Square and cube numbers Powers and roots Negative indices (E) Rational and irrational numbers, including surds Pythagoras' Theorem and Trigonometry Pythagoras' theorem (find the hypotenuse) Pythagoras' theorem (find any side) Identify the hypotenuse, opposite and adjacent sides Ratios in right-angled triangles Use the tangent ratio to find an unknown side length Use the sine and cosine ratio to find an unknown side length Use trigonometric ratios to find an unknown side length Use trigonometric ratios to find an unknown angle	

		Expand double brackets Factorise quadratic expressions (positive only) Factorise quadratic expressions Difference of two squares (E) Solve quadratic equations equal to 0 Solve quadratic equations by factorisation Quadratic graphs of the form $y = x^2 + a$	<u>Work with Fractions</u> Fraction of an amount Increase or decrease an amount by a fraction Use a fraction to find the whole Equivalent fractions and mixed numbers Add and subtract fractions Multiply fractions Divide fractions Solve problems with fractions	Equation of a straight line graph given two points (E) Real-life straight line graphs <u>Probability</u> Probability of a single event Use the property that probabilities sum to 1 List outcomes Relative frequency Sample spaces for one or more events Two-way tables Frequency trees Independent events Tree diagrams for independent events Tree diagrams for dependent events (E)	frequency table Averages from a grouped frequency table Use data to compare distributions (E) Types of data Sampling Scatter graphs Interpolation and extrapolation (E) <u>Non-Linear Graphs</u> Quadratic graphs Intercepts and roots of quadratic graphs (E) Cubic graphs Approximate solutions to equations using graphs (E)	Understand and represent vectors Vector notation Vectors multiplied by a scalar Add vectors Add and subtract vectors Solve problems with vectors (E)	<u>Simultaneous Equations</u> Use one value to find another Introduction to simultaneous equations Solve simultaneous equations using graphs Solve simultaneous equations (no adjustments) Manipulating equations Solve simultaneous equations (adjust one) Solve simultaneous equations (adjust both)
11 Higher	<u>Gradients and Lines</u> Equations of Lines parallel to the Axes. Plot graphs using XY tables. Interpret $y=mx+c$. Find gradient between two points. Find the equation of a line from a graph. Find the equation of a line from two coordinateds. Recognise parallel lines share the same gradient. Find the gradient of a perpendicular line. <u>Non-Linear Graphs</u> Plot Quadratic Graphs. Plot Cubic Graphs. Plot Reciprocal Graphs. Recognise key points on a Quadratic curve. Use Exponential Graphs. Know and use the equation of a circle. Find the equation of a tangent to a circle. <u>Using Real Life Graphs</u>	<u>Expanding and Factorising</u> Expand and factorise with a single bracket. Expand double and triple brackets. Factorise quadratics. Factorise quadratics with a coefficient of x squared. Solve Quadratics by Factorisation. Complete the Square. Find the turning point of a Quadratic by completing the square. Solve Quadratics by Quadratic Formula. <u>Changing the Subject of a Formula</u> Solve Linear Equations and Inequalities. Form and Solve Equations. Change the Subject of a Formula. Change the Subject of a Formula where the subject appears more than once. Solve by Iteration.	<u>Calculations with Direct and Inverse Proportion</u> Scale Factors for Similar Shapes Algebraic Direct Proportion. Inverse Proportion worded problems. Algebraic Inverse Proportion. Ratio Worded Problems. Density, Mass and Volume. <u>Revision of Angles, Vectors and Circle Theorems</u> Revise angles in Parallel Lines. Revise Angles in Polygons. Solve problems involving Vectors. Revise Circle Theorems. Apply the Sine Rule and Cosine Rule. Apply $\frac{1}{2}ab \sin C$. <u>Revision of Nth Term, Inequalities and Simultaneous Equations</u> Nth Term of Linear Sequences. Nth Term of Quadratic Sequences.	<u>Revision of Transformations and Constructions</u> Reflections of Shapes. Rotations of Shapes. Translations of Shapes. Enlargements including with Negative and Fractional Scale Factors. Invariant Points. Constructions using compasses. Solving Loci Problems. Graphs of Trigonometric Ratios. Transforming Graphs <u>Revision of Probability and Expectation</u> Sample Space Diagrams. Product Rule for Counting. Complete and Interpret Venn Diagrams. Plans and Elevations of 3D shapes. Interpreting Scatter Graphs. <u>Teacher Led revision of Student Next Steps and Weaknesses</u>	<u>Revision: Teacher Led revision of Student Next Steps and Weaknesses</u> Teachers will use PPE2 data and other assessment techniques to determine student next steps. They will plan and deliver tailored lessons to address any weaknesses or misconceptions students have before they sit their GCSE's.		

		Reflect shapes in lines. Construct and interpret Conversion Graphs. Draw and Interpret Distance Time Graphs. Draw and Interpret Speed Time Graphs. Recognise graphs that represent proportion. Estimate the Area under a Curve. Estimate Gradient of a Curve.	Functions Forming and Solving with Function Machines Substitute into expressions and formulae. Use Function Notation. Work with Composite Functions. Work with Inverse Functions. Solve Quadratic Inequalities.	Solve Linear Simultaneous Equations. Solve Simultaneous Equations involving a Quadratic. Formal Algebraic Proof.	Teachers will use PPE2 data and other assessment techniques to determine student next steps. They will plan and deliver tailored lessons to address any weaknesses or misconceptions students have before they sit their GCSE's.	
11 Foundati on	<u>Percentages and FDP Equivalence</u> Equivalent fractions, decimals and percentages Calculating a Percentage of an amount without a calculator Calculator percentages using multipliers Percentage Increase and Decrease using multipliers Converting one value as a percentage of another <u>Percentage Change and Interest</u> Converting a fraction to a percentage using a calculator Calculating a Percentage Change Compound Interest and Depreciation Calculating Reverse Percentage <u>Types of Graphs and Charts</u> Draw and Interpret Pie Charts Draw and Interpret Scatter Graphs Use a Line of Best Fit Recognise types of correlation Interpret Grouped Frequency Tables Estimate the mean from a Grouped Frequency Table	<u>Accurate Constructions</u> Accurately draw and measure angles Construct Triangles Accurately Constructing a Perpendicular Bisector <u>Area of 2D shapes and Volume of 3D shapes</u> Recap of Area of 2D shapes including rectangles, triangles, parallelograms and trapeziums. Find the Area and Circumference of Circles Find the area and perimeter of sectors Find the volume and surface area of spheres when given the formula <u>Sequences and Nth Term</u> Continuing Sequences of Numbers Term to Term Rule of Sequences Finding the Nth Term of a Sequence Generating sequences from Nth Term Use and investigate Fibonacci Style Sequences Know Arithmetic and Geometric Progressions	<u>Right-Angled Triangles, Pythagoras' and Trigonometry</u> Pythagoras' Theorem to find missing lengths. Problem Solving involving Pythagoras' Theorem. SOHCAHTOA to find missing lengths. SOHCAHTOA to find missing angles. <u>Enlargements, Similarity and Congruence</u> Recognise Congruent Triangles and know the rules Recognise similar shapes. Find the missing length on similar shapes. Enlarge shapes with a centre of enlargement <u>Different ways to represent probabilities</u> Complete Sample Spaces and use them to find probabilities. Read and draw two-way tables. Fill out Venn Diagrams. Interpret Venn Diagrams and use them to find probabilities. Draw and Interpret Frequency Trees Draw and Interpret Probability Trees	<u>Laws of Indices and Standard Form</u> Calculate with Indices. Write numbers as a power of another number. Use Laws of Indices for Multiplying and Dividing. Use the Law of Indices for Brackets. Convert Numbers to and from Standard Form. Calculate with numbers in Standard Form. <u>Simultaneous Equations and Quadratics</u> Recap Solving Equations including Double-Sided and with Fractions. Solve Inequalities and represent them on a number line. Solve Simultaneous Equations. Plot Quadratic Graphs from XY tables. Know the significant parts of a Quadratic Curve. Factorise Quadratics and hence solve by factorization. <u>Compound Measures</u> Draw and Interpret Distance-Time Graphs. Calculate with Speed Distance and Time. Calculate with Density, Mass and Volume.	<u>Revision: Teacher Led revision of Student Next Steps and Weaknesses</u> Teachers will use PPE2 data and other assessment techniques to determine student next steps. They will plan and deliver tailored lessons to address any weaknesses or misconceptions students have before they sit their GCSE's.	

