Mathematics Year 10 Curriculum Overview

Year 10 Overview	In Years 10 & 11, the new mathematics GCSE will demand deeper and broader mathematical understanding. It will provide all students with greater coverage of key areas such as ratio, proportion and rates of change and requires students to apply their knowledge and reasoning to provide clear mathematical arguments. It will focus on ensuring that every student masters the fundamental mathematics that is required for further education and future careers. It will provide greater challenge for the most able students by thoroughly testing their understanding of the mathematical knowledge needed for higher level study and careers in mathematics, the sciences and computing. In Year 10 students will study advanced topics for the first time such as, quadratics, vectors and simultaneous equations. This will build on work from previous years where skills such as solving equations will be used within these more complex topics. During the year pupils who are expected to be entered for the Higher tier will begin to study more specific content such as circle theorems and the nth term for a quadratic sequence. Pupils will begin to sit mock GCSE papers to practice their recall skills, identify gaps in their knowledge and practice answering exam questions. Towards the end of the year pupils who have been identified as benefitting from extra support will begin to attend period 6.

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Week Number	Themes/ Topics	Key Knowledge & Skills	Key Assessments
1-6 (Autumn 1)	Unit 1 Algebraic Manipulation	In this step, students practise substituting given values into algebraic expressions and formulae. They should work with a range of expressions, including those with coefficients, exponents, multiple terms, and fractions. Use different types of numbers such as integers, negatives, decimals, and fractions. Students should practise both with and without a calculator. Students also simplify expressions involving the four operations, squaring, and square roots. Remind them that simplifying an expression keeps it equivalent. Review how to collect like terms, including those with powers, and practise simplifying expressions that include fractions or division by finding common factors. Encourage students to use the equivalence symbol (≡) where appropriate, and, if suitable, form expressions from real-life contexts before simplifying them. • Substitution • Collect like terms • Simplify expressions • Laws of indices • Expand a single bracket • Factorise into a single bracket	Algebraic Manipulation end of unit assessment DIRT following end of unit assessment
	Unit 2 Equations, inequalities and formulae	Students will have covered both equations and inequalities at Key Stage 3, and this unit offers the opportunity to revisit and reinforce standard techniques and deepen their understanding. Looking at the difference between equations and inequalities, students will establish the difference between a solution and a solution set; they will also explore how number lines can be used to represent the solutions to inequalities. As well as solving equations, emphasis needs to be placed on forming equations from given information. This provides an excellent opportunity to revisit other topics in the curriculum such as angles on a straight line/in shapes/parallel lines, probability, area and perimeter etc. • Solve equations • Solve fractional equations	Equations, inequalities and formulae end of unit assessment DIRT following end of unit assessment

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		• 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 • Change the subject where the subject appears more than once (H)	
	Unit 3 Quadratic expressions and equations	In this step, students build on their understanding of expanding double brackets of the form $(ax \pm b)(cx \pm d)$(ax±b)(cx±d) from Key Stage 3. Start with simple expressions like $(x+a)(x+b)$ using positive terms, then introduce negatives and coefficients as confidence grows. Explore unfamiliar forms such as $(x+2)2$. Use area models or algebra tiles to help students visualise the process. Ensure they are confident with simplifying expressions and working with negative numbers. Where suitable, extend learning by expanding brackets in real contexts, such as finding the area of shapes with binomial dimensions. • Expand double brackets • Expand triple brackets (H) • Factorise quadratic expressions • Factorise more complex quadratic expressions • Difference of two squares • Solve quadratic equations equal to 0 • Quadratic expressions and equations • Solve quadratic equations by factorisation • Solve more complex quadratic equations by factorisation (H) • Complete the square (H) • Complete the square with more complex quadratic expressions (H) • Solve quadratic equations by completing the square (H) • Solve quadratic equations using the quadratic formula (H)	Quadratic expressions & equations end of unit assessment DIRT following end of unit assessment

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7-13 (Autumn 2)	Unit 4 Percentages	Students begin by working out percentages of simple numbers so they can practise the key methods before moving on to more challenging calculations. They will also learn to use **multipliers**, which allow them to find percentages in a single step. This approach becomes especially useful later in the topic. Some students, particularly those who followed the Support Curriculum in Year 9, may not have used multipliers before, so this will be introduced carefully. This part of the curriculum also includes real-life examples, such as calculating how much tax someone might pay, to help students understand how percentages are used in everyday situations. • 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	Percentages end of unit assessment DIRT following end of unit assessment
	Unit 5 Ratio & Scale	In this step, students learn how to find equivalent ratios and how to simplify them, building on what they covered in Key Stage 3. They revisit the idea of finding the highest common factor of the numbers in a ratio and learn that dividing both parts by this number gives the ratio in its simplest form. They also explore other methods, such as simplifying a ratio in stages (for example, dividing 24:18 by 2 and then by 3). Students will discuss what makes ratios equivalent — that they are created by multiplying or dividing both numbers by the same value — and practise creating their own, such as	Ratio & Scale end of unit assessment DIRT following end of unit assessment

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		doubling both parts of a ratio. They also look at ratios involving real-life units like money, time or length, and learn that the units must match before the ratio can be simplified. If appropriate, students may also be introduced to writing ratios in the form 1:n or n:1. This was an extension topic in Year 8, so some students may be encountering it for the first time. • 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 • Share in a ratio (algebraically) • Ratios and scales	
	Unit 6 Working with Fractions	In this step, students revisit and build on their understanding of how to find fractions of amounts, a skill they began developing in Key Stage 3. They learn that finding a fraction of a number is simply a matter of multiplying that number by the fraction, and they apply this idea to a range of different problems. Students also explore how this skill is used in real-life situations, such as calculating fractions of time, measurements or quantities. They are encouraged to make links with what they've recently learned about percentages and ratios, helping them see how these three ideas are closely connected and often used together when solving problems. Bar models are used to support understanding, as they give students a clear visual representation of how a whole can be split into fractional parts, making it easier to identify the fraction of the amount needed. • Fraction of an amount	Working with Fractions end of unit assessment DIRT following end of unit assessment

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		• 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 • Add and subtract algebraic fractions (H) • Multiply algebraic fractions (H) • Divide algebraic fractions (H) • Simplify algebraic fractions by factorising (H) • Add and subtract more complex algebraic fractions (H) • Multiply and divide more complex algebraic fractions (H) • Solve equations with algebraic fractions (H)	Termly GCSE exam paper Pinpoint learning booklets/retest
14-18 (Spring 1)	Unit 7 Non-Calculator Methods	This block revises and builds on KS3 content for calculation. Mental methods and using number sense are to be encouraged alongside the formal methods for all four operations with integers, decimals and fractions. Where possible this should be covered through problems, particularly multi-step problems in preparation for GSCE. • Place value for integers and decimals	Non-calculator methods end of unit assessment DIRT following end of unit assessments

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	Unit 8 Straight line Graphs	• Compare and order numbers • Add and subtract integers and decimals • Multiply and divide integers and decimals • Four operations with directed number • Order of operations • Related calculations • Solve multi-step problems • Convert recurring decimals to fractions • Convert more complex recurring decimals to fractions (H) In this unit, students deepen their understanding of straight-line graphs, building on the foundations laid in earlier years. They learn how to recognise, interpret and draw graphs using the equation of a line, typically written in the form $y = mx + c$. Students explore what the gradient (m) and the y-intercept (c) represent and how changing these values affects the steepness and position of the line. They also learn how to find the gradient between two points, plot linear equations efficiently, and rearrange equations into a form that helps them sketch or interpret a graph. This knowledge is applied to a range of real-life contexts, such as interpreting graphs that show speed, cost, or other changing quantities. Throughout the unit, students use graphs to solve problems, including finding where two lines meet (the point of intersection), which links directly to algebraic methods they will encounter later in Year 10 and Year 11. The topic helps strengthen their algebra skills, improves their ability to work with coordinates, and prepares them for more advanced graph work at GCSE	Straight line Graphs end of unit assessment DIRT following end of unit assessments

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	Unit 9 Probability	• Plot 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 • 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 • Real-life straight-line graphs In this unit, students build on their earlier understanding of chance and uncertainty by exploring probability in a more structured and systematic way. They learn how to represent probabilities using fractions, decimals and percentages, and how these can be used to compare the likelihood of different events. Students work with key ideas such as mutually exclusive events, combined events and expected outcomes. They use tools like probability scales, sample spaces and frequency trees to organise information and calculate probabilities accurately. Students also learn how to interpret experimental data and compare it to theoretical probability, helping them understand why real-life results don't always match predictions exactly. This topic encourages logical thinking and careful reasoning, as students must justify their answers and consider all possible outcomes. It also strengthens links to other areas of maths such as fractions, ratios and statistics, and supports essential skills for GCSE exams and everyday decision-making	Probability end of unit assessment DIRT following end of unit assessments

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		• Find the probability of a single event • Use the property that probabilities sum to 1 • List outcomes • Relative frequency • Sample spaces for 1 or more events • Two-way tables • Frequency trees • Independent events • Tree diagrams for independent events • Tree diagrams for dependent events (E) • Conditional probability (Tree diagrams) (H)	
19-24 (Spring 2)	Unit 10 Rounding and Estimation	In this unit, students develop their confidence in rounding numbers and using estimation to check the accuracy and reasonableness of answers. They revisit key rounding skills—such as rounding to a given number of decimal places or significant figures—and apply them to more complex calculations. Students learn how estimation can be used as a powerful tool to sense-check results, spot errors and solve problems more efficiently. They practise estimating answers before or after using a calculator, helping them judge whether an answer "makes sense." This is especially important in topics involving large numbers, decimals or multi-step calculations. The unit also highlights how rounding and estimation are used in real-life contexts, such as money, measurements, time and everyday decision-making. These skills support students	Rounding & estimation end of unit assessment DIRT following end of unit assessments

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	Unit 11 Perimeter, Area & Volume	across the maths curriculum and strengthen their problem-solving as they move toward GCSE exams. • Round to decimal places • Round to significant figures • Estimate answers to calculations • Use of a calculator • Error intervals (including truncation) (E) • Upper and lower bounds (H) In this unit, students build on the shape and measurement skills they learned in earlier years by working with more complex 2D and 3D shapes. They revisit how to calculate perimeter and area for familiar shapes such as rectangles, triangles and circles, and extend this knowledge to composite shapes and problems involving missing lengths. Students also explore volume and surface area of 3D shapes, including prisms, cylinders and pyramids. They learn the key formulas, understand where these formulas come from, and apply them to a variety of real-world situations—such as working out how much material is needed to cover a surface or how much space a container can hold. Throughout the unit, students develop their ability to choose the correct method, work accurately with units, and break down more challenging problems into manageable steps. These skills support their wider mathematical understanding and prepare them for the geometry and measure work expected at GCSE.	Perimeter Area & Volume end of unit assessment DIRT following end of unit assessments

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	Unit 12 Interpret & Represent data	• Name 2-D and 3-D shapes • Perimeter of a 2-D shape • Area of a 2-D shape • Area of a compound shapes • 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 • Arc length and perimeter (H) • Area of a sector (H) • Volume of a cylinder • Surface area of a cylinder In this unit, students strengthen their ability to understand, present and analyse data in a range of different forms. They build on skills from earlier years by revisiting common charts and graphs—such as bar charts, pie charts, line graphs.—and learning how to choose the most appropriate way to represent different types of information. Students practise interpreting data accurately, identifying trends and making comparisons. They also develop their understanding of key statistical measures, such as the mean, median, mode and range, using these to summarise and describe sets of data clearly. The unit introduces more advanced representations used at GCSE, such as scatter graphs. Through these, students learn how to analyse distributions, spot patterns and understand relationships between variables. Real-life contexts—such as sports results, surveys or scientific data—are used throughout to show how data is used to make decisions and draw conclusions. These skills support	Interpret & represent data end of unit assessment DIRT following end of unit assessments

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	Unit 13 Non-linear Graphs	students not only in maths but also in subjects like science and geography, and are essential for GCSE success. • 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 (E) • Types of data • Sampling • Scatter graphs • Interpolation and extrapolation (E) • Capture and recapture (H) In this unit, students extend their graphing skills by exploring a range of non-linear graphs—graphs that do not form straight lines. They learn to recognise, sketch and interpret different types of curves, including quadratic graphs (U-shaped curves), cubic graphs, reciprocal graphs and exponential graphs. Students build on their algebra knowledge by plotting graphs from tables of values and by understanding how changes in an equation affect the shape and position of its graph. They also learn how to identify key features of non-linear graphs, such as turning points, symmetry and asymptotes. Throughout the unit, students use these graphs to solve problems, such as estimating solutions where graphs cross the axes or where two curves intersect. Real-life examples, such as growth and decay or speed-time relationships, help students understand how these graphs model real situations. This topic strengthens students' understanding of algebra, prepares them for more advanced GCSE questions, and helps them build confidence in interpreting a wider variety of graphs.	Non-Linear Graphs end of unit assessment DIRT following end of unit assessments

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		• Quadratic graphs • Intercepts and roots of quadratic graphs (E) • Cubic graphs • Approximate solutions to equations using graphs (E) • Turning points (H) • Equation of the tangent to a curve (H) • Estimate the area under a curve (H) • Equation of a circle (H) • Equation of a tangent to a circle (H)	
25-30 (Summer 1)	Unit 14 Angles	In this unit, students build on their earlier geometry work by revisiting key angle facts and applying them to more complex diagrams and problem-solving situations. They review core ideas such as angles on a straight line, angles around a point, vertical opposite angles and angles in triangles and quadrilaterals. Students then apply these facts to multi-step problems, including working with parallel lines and angle relationships such as corresponding, alternate and co-interior angles. They also use algebra alongside angle rules, developing the ability to form and solve equations to find unknown angles. The unit introduces more challenging geometric reasoning, helping students justify their thinking clearly and logically. Students learn how to communicate their reasoning using accurate mathematical language, diagrams and step-by-step explanations.	Angles end of unit assessment DIRT following end of unit assessments

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	Unit15 Graphs & Diagrams	These skills support success in higher-level geometry topics and prepare students for the reasoning and problem-solving style of questions they will meet at GCSE. • Angles around a point, on a straight line and vertically opposite • Angles in triangles and quadrilaterals • Exterior angles of any polygon • Interior angles of any polygon • Solve problems with angles in polygons • Alternate, corresponding and co-interior angles • Solve problems with angles in parallel lines • Solve problems with angles and algebra • Prove geometric facts (E) this unit, students develop their ability to understand and use a wide range of graphs and diagrams, helping them interpret information accurately and communicate data clearly. They build on knowledge from Key Stage 3 by revisiting familiar representations—such as bar charts, line graphs and pie charts—while being introduced to more advanced diagrams used at GCSE. Students learn how to read and create **distance–time graphs**, **speed–time graphs** and other real-life graphs, interpreting key features such as gradients, changes over time and what different sections of a graph represent. They also explore **stem-and-leaf diagrams**, **scatter graphs** and **correlation**, learning how to spot patterns and describe relationships between variables. Throughout the unit, students practise selecting the most appropriate graph or diagram for different types of data and learn how to draw diagrams accurately and clearly. They also use the information shown in these representations to make comparisons, spot trends and solve problems.	Graphs & Diagrams end of unit assessment DIRT following end of unit assessments

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		This topic builds confidence in interpreting visual information—an essential skill for GCSE maths and for many subjects beyond the classroom, including science, geography and everyday decision-making. • Pictograms • Line and bar charts • Dual and composite bar charts • Draw pie charts • Interpret pie charts • Time-series graphs • Frequency polygons • Stem-and-leaf diagrams • Draw histograms (H) • Interpret histograms (H) • Draw cumulative frequency diagrams (H) • Interpret cumulative frequency diagrams (H) • Box plots (H) • Compare distributions using box plots (H) Students will have met vectors to describe translations during Key Stage 3. This will be revisited and used as the basis for looking more formally at vectors, discovering the meaning of ***-a*** compared to ***a*** to make sense of operations such as addition, subtraction and multiplication of vectors. This will connect to exploring 'journeys' within shapes linking different notations. Higher tier students will then use this understanding as the basis for developing geometric proof, making links to their knowledge of properties of shape and parallel lines. • Understand and represent vectors • Use and read vector notation • Draw and understand vectors multiplied by a scalar • Draw and understand addition of vectors • Draw and understand addition and subtraction of vectors	Vectors end of unit assessment

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	Unit 16 Vectors	• Explore vector journeys in shapes (H) • Explore quadrilaterals using vectors (H) • Understand parallel vectors (H) • Explore co-linear points using vectors (H) • Use vectors to construct geometric arguments and proofs (H)	DIRT following end of unit assessment
31-38 (Summer 2)	Unit 17 Factors powers and Surd(H)	In this unit, students strengthen their understanding of number structures by working with factors, powers and surds. They begin by revisiting key skills such as finding highest common factors (HCF), lowest common multiples (LCM) and using prime factorisation. This helps build a solid foundation for more advanced algebra and problem-solving later in the year. Students then deepen their knowledge of indices (powers), including simplifying expressions involving powers and understanding the laws of indices. This includes working with integer, fractional and negative powers, helping them recognise patterns and use efficient methods when manipulating expressions. The unit also introduces **surds**, which are square roots that cannot be simplified into whole numbers. Students learn how to simplify surds, how to add, subtract and multiply them, and why leaving answers in surd form can sometimes be more accurate than using decimals. Throughout the unit, students apply these ideas to algebraic expressions and real-life problems, helping them develop accuracy, logical thinking and confidence in working with more abstract mathematical concepts. These skills provide essential preparation for the algebra and geometry topics they will meet across GCSE Maths.	Factors, powers and Surds (H) end of unit assessment DIRT following end of unit assessment

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	Unit 18 Pythagors' Theorem & Trigonometry	• Factors, multiples and primes • Prime factorisation • HCF and LCM • Square and cube numbers • Powers and roots • Negative indices • Irrational numbers and surds • Simplify expressions with surds (E) • Expand brackets with surds • Fractional indices (H) • Four operations with surds • Rationalise the denominator (H) • Expand double brackets with surds (H) • Rationalise the denominator with more complex denominators (H) • Solve problems with surds (H) In this unit, students build on the foundations of right-angled triangle work introduced in Key Stage 3. They revisit **Pythagoras' Theorem**, using it to find missing sides in right-angled triangles and applying it to more complex problems, including questions involving shapes, coordinates and real-life contexts. Students also extend their understanding of **trigonometry** (sine, cosine and tangent). They learn how to use trigonometric ratios to find missing sides and angles in right-angled triangles, and they practise selecting the correct method depending on the information given. This includes interpreting diagrams carefully and working through multi-step problems. As they progress, students apply both Pythagoras and trigonometry in combination, developing the confidence to use these tools in unfamiliar situations. They also begin to	End of year exams Pinpoint learning booklets/retest Pythagoras & Trig end of unit assessment DIRT following end of unit assessment

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		recognise when these methods appear in other areas of maths, such as bearings, scale diagrams and vectors. This unit strengthens students' spatial reasoning and problem-solving skills and provides essential preparation for the more advanced trigonometry and geometry topics they will meet later at GCSE. • Pythagoras' theorem (find the hypotenuse) • Pythagoras' theorem (find any side) Identify 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 • Exact trigonometric values • Trigonometry in 3-D shapes (H) • Area of a non-right-angled triangle (H) • Use the sine rule to find an unknown length (H) • Use the sine rule to find an unknown angle (H) • Use the cosine rule to find an unknown length (H) • Use the cosine rule to find an unknown angle (H) Students now move on to the solution of simultaneous equations by both algebraic and graphical methods. The method of substitution will be dealt with before elimination, considering the substitution of a known value and then an expression. With elimination, all types of equations will be considered, covering simple addition and subtraction up to complex pairs where both equations need adjustment. Links will be made to graphs and forming the equations will be explored as well as solving them.	

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	Unit 19 Simultaneous Equations	The Higher strand will include the solution of a pair of simultaneous equations where one is a quadratic, again dealing with factorization only at this stage. • Understand that equations can have more than one solution • Determine whether a given (x, y) is a solution to a pair of linear simultaneous equations • Solve a pair of linear simultaneous equations by substituting a know variable • Solve a pair of linear simultaneous equations by substituting an expression • Solve a pair of linear simultaneous equations using graphs • Solve a pair of linear simultaneous equations by subtracting equations • Solve a pair of linear simultaneous equations by adding equations • Use a given equation to derive related facts (R) • Solve a pair of linear simultaneous equations by adjusting one equation • Solve a pair of linear simultaneous equations by adjusting both equations • Form a pair of linear simultaneous equations from given information • Form and solve pair of linear simultaneous equations from given information • Determine whether a given (x, y) is a solution to both a linear and quadratic equation (H) • Solve a pair of simultaneous equations (one linear, one quadratic) using graphs (H) • Solve a pair of simultaneous equations (one linear, one quadratic) algebraically (H) • Solve a pair of simultaneous equations involving a third unknown (H)	Simultaneous Equations end of unit assessment DIRT following end of unit assessment