**HIGHER: Key Stage 4 Maths Curriculum**

**Long term plan Year 9 2024-2025**

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| **Autumn 1** |  |  |  |
| **Fractions and percentages** | **Probability** | **Standard form** | **Linear inequalities** |
| **Assessment 1 : Fractions and percentages unit assessment** |  |  | **Assessment 2 Probability standard form and inequalities** |
| **Builds Upon:**   * Finding equivalent fractions * Ordering fractions * Multiplying fractions * Finding percentages of amounts without a calculator * Finding percentages of amounts with a calculator | **Builds Upon:**   * Writing probabilities as fractions, decimals and percentages * Probabilities of mutually exclusive events * Finding fractions of amounts * Finding percentages of amounts | **Builds Upon:**   * Using standard form with positive indices * Using standard form with negative indices * Index rules with positive indices * Index rules with negative indices * Using a calculator | **Builds Upon:**   * Use of greater than less than symbols |
| **Introduces:**   * Convert between fractions, decimals and percentages * Ordering fractions, decimals and percentages * Find fractions of amounts without a calculator with reasoning and application * Find fractions of amounts with a calculator with reasoning and application * Find percentages of amounts without a calculator with reasoning and application * Find percentages of amounts with a calculator with reasoning and application * Calculate percentage change (without a calculator) with reasoning and application * Calculate percentage change (with a calculator) with reasoning and application * Find original values in percentage calculations (AKA: calculate reverse percentages) * Find the percentage an amount has been changed by * Solve simple interest calculations | **Introduces:**   * Calculate experimental probabilities * Calculate expected results from repeated experiments * Construct and interpret frequency trees | **Introduces**   * Multiply and divide numbers in standard form * Add and subtract numbers in standard form * Standard form with a calculator | **Introduces**   * Reading and drawing inequalities on number lines * Solving single inequalities * Solve inequalities with the unknown on both sides * Solve double inequalities * Construct and Solve inequalities |

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| **Autumn 2** | |
| **Quadratic equations and formulae** | **Constructions and Circles** |
| **Assessment 3 Quadratic equations and formulae assessment** | **Assessment 4 Autumn Topics Assessment Part 1** |
| **Builds Upon:**   * Factorising into one bracket * Solving equations with two or more steps * Solving equations with the variable on both sides * Solving equations with the variable in the denominator | **Builds upon:**   * Using a ruler |
| **Introduces:**   * Expanding double brackets * Recognising Quadratic expressions * Factorise quadratic equations of the form x^2+bx+c * Factorise the difference of two squares * Factorise to solve quadratic equations of the form x^2+bx+c=0 * Factorise to solve quadratic equations of the form x^2+bx+c=0 * Change the subjects of formulae with one step * Change the subjects of formulae with two or more steps * Change the subjects of formulae with two or more steps | **Introduces :**   * Construct bisectors of angles * Construct perpendicular bisectors and lines |

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| **Spring 1** |
| **Chapter 6: Formulae & Functions** |
| **Assessment 5:**  Term 1 Assessment Part 2  **Assessment 6 :** Chapter 6 Formulae and functions Test A |
| **Builds Upon:**   * Write formulae from sentences * Substitute to solve (positive and negative numbers) * Use standard formulae (e.g. kinematics) * Simplify expressions * Expand single brackets * Simplify algebraic fractions |
| **Introduces:**   * Change the subject of formulae * Construction mapping diagrams for functions * Write the inverse of a function f(x) 🡪 f —1(x) * Write and solve composite functions * Identify expressions, equations, inequalities, formulae and identities * Prove identities and find missing values Prove statements to be true or false * Expand double brackets * Factorise quadratic expressions * Distinguishing between, and factorise : x2 - 4 and x2 - 4x * Complete the difference of two squares |

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| **Spring 2** |
| **Chapter 3: Angles and Polygons** |
| **Assessment 7:** Chapter 3 Angles  **Assessment 8 :** Chapter 3 Angles and Polygons Test A |
| **Builds Upon:**   * Measure and describe angles as acute, right, obtuse or reflex * Describe and apply the properties of angles around a point (sum of 360 degrees) * Describe and apply the properties of angles on a straight line (sum of 180 degrees) * Derive and apply the sum of angles in triangles and quadrilaterals * Calculate interior angles in polygons (using angles in a triangle) * Deduce and apply the sum of interior angles of any polygon and use (n-2)\*180 |
| **Introduces:**   * Calculate bearings based on angles around a point * Describe and apply the equivalence of vertically opposite angles * Identify and apply the properties of angles in parallel lines (alternate, corresponding and co-interior rules) * Apply knowledge of special triangles to derive angles * Solve problems involving all of the above (providing reasons) * Identify similarity between shapes * Calculate and apply scale factors * Identify and describe types of congruence (SSS, SAS, ASA, RHS) * Apply similarity and congruence to problem solve * Calculate and apply scale factors for area and volume from the linear scale factor * Calculate exterior angles in polygons * Solve problems involving angles in polygons |

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| **Summer 1** |
| **Chapter 7: Working in 2D** |
| **Assessment 9:** Key Assessment  Assessment 10 : Chapter 4 Handing data Test A |
| **Builds Upon:**   * Accurately measure and draw line segments and angles * Bearings on a map * Area of quadrilaterals (squares/rectangles/parallelograms/trapeziums) and triangles * Area of compound 2D shapes |
| **Introduces:**   * Apply scale to drawings -find distances on a map and in real life * Sketching lines such as y = -2, y = x etc. * Completing transformations:   + Translations   + Reflections   + Rotations from origin and a point   + Enlargements (scale factor greater than 1, between 0 and 1, & negative)   + Enlargements from a point   + Combinations of Transformations * Describing transformations |

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| **Summer 2** | |
| **Chapter 4: Handing Data 1** | **Chapter 5: Fractions Decimals and Percentages** |
| **Assessment:** Chapter 4 Handing data 1 Test A | **Assessment:** Chapter 5 Fractions Decimals and Percentages Test A |
| **Builds Upon:**   * Construct and interpreting bar charts * Construct and interpret two way tables * Calculate the mean, mode and median of listed data | **Builds Upon:**   * Name and construct fraction diagrams * Convert between improper fractions and mixed numbers * Identify and create equivalent fractions * Simplifying fractions * Write fractions as decimals * Order fractions and mixed numbers * Calculate fractions of amounts * Calculating percentages of amounts * Multiplying fractions, including simplifying (cancelling common factors) * Multiplying fractions and mixed numbers * Dividing fractions and mixed numbers * Adding and subtracting fractions with the same denominator * Adding and subtracting fractions with different denominators * Adding and subtracting mixed numbers * Solve worded fraction problems * Write percentages as fractions and decimals * Converting between fractions, decimals and percentages * Compare using < or > and order fractions, decimals and percentages |
| **Introduces:**   * Construct and interpret pie charts * Calculate the mean, mode and median of data in a frequency table * Understand the advantages and disadvantages of different averages * Calculate the range and interquartile range * Identify outliers and explain their effect on averages/ranges * Compare distributions using averages and range Construct frequency tables for grouped data * Construct and interpret Histograms with equal widths * Construct and interpret Histograms with unequal class widths * Calculate frequency density | **Introduces:**   * Convert recurring decimals to fractions * Solving complex worded problems with a mixture of fractions, decimals and percentages * Solving algebraic fractions * Simplifying algebraic fractions using factorisation of single and double brackets |

**Long term plan Year 10 2025-2026**

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| **Autumn 1** | |
|  | **Chapter 9: Estimation and Approximation** |
|  | **Assessment:** Chapter Test A |
|  | **Builds Upon:**   * Round to appropriate degree of accuracy (10,100,1000s, dps, sfs) * Use approximation to make estimates * Check calculations using approximation and estimation * Use common calculator functions * Convert units of length, mass, volume, capacity, time and area * Calculate the upper and lower bounds of rounded values |
|  | **Introduces:**   * Estimate square roots * Calculate compound units of speed and density * Rearrange compound unit calculations to find missing values * Use inequality notation to state error intervals and interpret limits of accuracy |

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| **Autumn 2** |
| **Chapter 10: Equations and Inequalities** |
| **Assessment:** Chapter Test A |
| **Builds Upon**:   * Solving two step equations (brackets, negatives) * Solving equations involving fractions (and implied brackets) * Solving equations with the unknown on both sides * Forming and solving equations * Solving by completing the square * Solving by applying the quadratic formula * Forming and solving quadratic equations * Solving simultaneous equations graphically * Solving simultaneous equations using elimination * Solving equations using trial and improvement |
| **Introduces:**   * Solving quadratics graphically for the roots (x intercepts) * Solving quadratics with/without coeff of x^2 by factorising * Solving simultaneous equations using substitution * Solving simultaneous equations between a linear and quadratic * Forming and solving simultaneous equations * Using iteration formulae to find a solution to a given number of decimal places |

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| **Spring 1** | |
| **Chapter 11: Circles and Constructions** | **Chapter 13: Factors, powers and roots** |
| **Assessment:** Chapter Test A | **Assessment:** Chapter Test A |
| **Builds Upon**:   * Circumference of circles * Area of circles * Circumference and area of composite shapes involving parts of circles * Construct angle * Construct line bisectors (of a line, from a point to a line, from a point on a line) * Construct triangles * Construct quadrilaterals, * Construct an angle of 60 degrees * Construct loci from points, lines, around shapes etc. * Construct loci involving a change of radius or rolling shapes etc. | **Builds Upon:**   * Know and use the language of prime numbers, factors and multiples * Write a number as the product of its prime factors (prime decomposition) * Construct a prime factor venn * Identify HCF * Identify LCM * Find square and cube roots of numbers and apply law of indices |
| **Introduces:**   * Arc length * Area of sectors * Perimeter and area of composite shapes involving sectors * Circle Theorems * Proof of circle theorems | **Introduces:**   * Estimate the square or cube root of an integer * Simplify expressions involving surds * Rationalise fractions involving surds |

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| **Spring 2** | |
| **Chapter 12: Ratio and proportion** | **Chapter 14: Graphs 1** |
| **Assessment:** Chapter Test A | **Assessment:** Chapter Test A |
| **Builds Upon:**   * Express proportions of an amounts as fractions or percentages * Calculate percentage increases and decreases using multiplication * Find the original value follow a percentage increases and decreases * Simplify ratios * Write ratios from worded questions | **Builds Upon:**   * Equation of a straight line y=mx+c * Calculating gradient * Identifying y intercept * Graphing linear equations * Writing the equation for linear graphs * Properties of parallel and perpendicular lines * Writing the equations for parallel and perpendicular lines * Equation of quadratic curves ax2+bx+c=y * Graph quadratic equations |
| **Introduces:**   * Share amounts into a ratio (ADAM) * Use scale factors, scale diagrams and maps. * Understand and calculate simple interest | **Introduces:**   * Identifying x intercepts (roots) and y intercepts graphically and algebraically * Identifying turning points graphically and algebraically * Properties of quadratic functions * Kinematic graphs (solving distance, speed and acceleration problems) * Solving Inequalities * Graphing Inequalities |

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| **Summer 1** | |
| **PPES** | **Chapter 15: Working in 3D** |
| **Assessment** 2x 90 minute PPEs | **Assessment:** Chapter Test A |
| **Builds Upon**   * Describe exam strategies and explain MTGs/ grade boundaries and progress * Apply exam strategies to Practice Paper 1 questions (Non Calculator) * Apply set theory to venn diagrams (MG) * Manipulate fractional and negatives indices (MG) * Solve simultaneous equations * Solve quadratic simultaneous equations * Apply circle theorem to exam questions * Solve ratio problems through combining ratios (MG Ratios 2) | **Builds Upon:**   * Draw and interpret net diagrams * Calculate surface area of 3D shapes * Draw and interpret plans and elevation of 3D shapes * Calculate volume of a right prism * Calculate volume of a cylinder |
|  | **Introduces:**   * Apply compound units to calculate mass (m=vd) * Calculate the volume of frustums, spheres, hemispheres pyramids and cones * Apply reasoning and problem solving |

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| **Summer 2** | |
| **Chapter 19: Pythagoras, Trigonometry and Vectors** | **Chapter 16: Handling Data 2** |
| **Assessment:** Chapter A Test | **Assessment:** Chapter Test A |
| **Builds Upon:**   * Apply Pythagoras' theorem to find long sides * Apply Pythagoras' theorem to find short sides | **Builds Upon:**   * Calculate estimated mean,modal class and class interval of the median for grouped data * Construct scatter graphs and describe correlation * Make predictions based on the correlation (interpolation vs. extrapolation) * Construct time series graphs * Discuss any short term trends, seasonal variation and longer term trends * Construct histograms * Solve frequency density problems using histograms |
| **Introduces:**   * Apply Pythagoras’ theorem to find distance between two points * Apply trigonometric ratios (sin/cos/tan) to find missing sides in right angle triangles * Apply trigonometric ratios (sin/cos/tan) to find missing angles in right angle triangles * Know the exact values of sinØ and cosØ for Ø= 0, 30,45,60,90 degrees * Know the exact value of tan Ø for Ø= 0,30,45,60 degrees * Apply the sine rule to find missing lengths and angles * Apply the cosine rule to find missing lengths and sides * Apply sine formula for the area of non right angle triangles * Solve 3D Pythagoras’ theorem and trigonometry problems * Write column vectors and draw vector diagrams * Add and subtract vectors * Calculate multiples of vectors using a scalar * Use vectors in geometric proofs | **Introduces:**   * Construct and interpret box plots * Construct and interpret cumulative frequency graphs   Compare spread using box plots |

**Year 11 2026-2027**

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| **Autumn 1** | |
| **Chapter 17: Calculations 2** | **Chapter 18: Graphs 2** |
| **Assessment:** Chapter Test A | **Assessment:** Chapter Test A |
| **Builds Upon:**  Convert in and out of index form   * Solve calculations involving index laws (including roots, negatives, fractional indices) * Convert in and out of standard form * Solve calculations in standard form | **Builds Upon:**   * Graphing linear and quadratics equations * Sketching translations (including reflections, transformations etc.) |
| **Introduces:**   * Simplify and manipulate surds * Solve calculations involving factions, surds and pi * Construction mapping diagrams for functions * Write the inverse of a function f(x) 🡪 f —1(x) * Write and solve composite functions | **Introduces:**   * Recognise and plot graphs of cubic functions * Recognise and plot graphs of reciprocal functions * Recognise and sketch graphs of exponential functions * Recognise and sketch trigonometric functions * To recognise and sketch translation and reflections of graphs * Draw and interpret non-standard graphs of real-life situations * Gradients and areas under graphs * Equation of a circle * Find the tangent to a circle at a point |

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| **Autumn2** | |
| **PPES** | **Chapter 20 Combined Events** |
| **Assessment** 2x 90 minute PPES | **Assessment**: Chapter A Test |
|  | **Builds Upon:**   * Arrange sets into Venn diagrams * Describe sets using Venn diagrams (intersection, union and complement) * Construct possibility (sample) space diagrams  Calculate probabilities from sample space diagrams * Use tree diagrams to show the frequency or probabilities of two events * Use tree diagrams to calculate the probabilities of independent and dependent events * Use Venn diagrams to record outcomes and calculate probabilities of events * Calculate estimated outcomes using probabilities |
|  | **Introduces:**   * Application and problem solving |

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| **Spring 1** | |
| **Chapter 22: Units and Proportionality** | **Chapter 21: Sequences** |
| **Assessment:** Chapter A Test | **Assessment** Chapter A Test |
| **Builds Upon:**   * Calculations using standard and compound units (speed, density and pressure) * Compare lengths, areas, and volumes of similar shapes * Solve direct proportion problems * Interpret the gradient of a straight line graph as a rate of change * Solve inverse proportion problems | **Builds Upon:**   * Write sequence using term to term rule * Write sequences using position to term rule (nth rule) * Write the position to term rule (nth rule) for a linear sequence * Recognise special types of sequence (square, cube, triangular, arithmetic, geometric, Fibonacci and quadratic) * Find terms of quadratic sequence using term to term or position to term rule * Write the position to term rule (nth rule) for a quadratic sequence |
| **Introduces:**   * Interpret graphs that illustrate direct and inverse proportion * Set up, solve and interpret growth and decay problems | **Introduces:**   * Applications to problem solving |

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| **Spring 2** | | |
| **PPES** | **23: Algebraic Proofs** |  |
| **Assessment** 2x 90minute PPES | **Assessment NA** |  |
|  | **Builds Upon**   * Algebraic identities * Constructing mathematical arguments |  |
|  | **Introduces**   * Counter examples * LHS/RHS proofs * Odd/Even proofs |  |

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| **Summer 1** |
| **GCSE EXAM REVISION** |
| **Assessment:**  **3 x 90 minute formal public exams** |
| **Builds Upon:**  Content informed by QLAs and teacher led |
| **Introduces:** |

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| **Summer 2** |
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