Mathematics

Key Stage 4 Curriculum Map

The Charter School North Dulwich

	Module One	Module Two	Module Three	Module Four	Module Five
Y10	Topics: Number Key Concepts • Estimating answers, limits of accuracy and calculating with bounds • Multiplication and division with decimals • Conversion between terminating and recurring decimals and fractions • Powers, index laws and operations with surds • Prime factor decomposition and using this to find highest common factor and lowest common multiple of two or more numbers. • Calculations with numbers in standard form Assessment: One Hour Assessment	Topics: Algebra Key Concepts • Solving linear equations (including involving algebraic fractions) and inequalities and equations with the unknown in the denominator • Expanding and factorising linear and quadratic expressions, including difference of two squares. • Expanding triple linear brackets • Solving quadratic equations algebraically and using graphs • Recognising graphs of functions • Simplifying algebraic fractions • Four operations with algebraic fractions • Algebraic proof • Understanding equivalence and Identities • Changing the subject (including when expanding or factorising is needed) • Equation of a straight line through two points, parallel	Topics: Ratio, Proportion and proportional change Key Concepts • Working with percentages and repeated percentage change using multipliers • Solving problems using reverse percentage change • Solving problems involving repeated percentage change compound interest and exponential decay • Understanding the difference between simple and compound interest • Working and problem solving with ratio • Comparing lengths, areas and volumes using ratio notation • Understanding similarity and scale factors • Understanding direct and inverse proportion and their related graphs • Understanding compound measure, including speed,	Topics: Geometry and Measure Key Concepts • Understanding and working with congruence and similarity and transformations • Angle geometry review. • Working with and problem solving with circle theorems • Area and perimeter (including compound shapes) • Working with circles and sectors of circles • Calculating volumes and surface areas of 3D shapes • Understanding similarity in 3D shapes • Using Pythagoras' Theorem and trigonometry in right angled triangles • Using exact trigonometric ratios • Problem solving with bearings and scale drawings.	Topics: Probability and statistics Key Concepts • Calculating probabilities using tree diagrams, Venn diagrams and sample space diagrams • Calculating probabilities of independent and mutually exclusive events • Understanding theoretical and experimental probabilities and expected and relative frequencies. • Interpreting Venn diagrams to calculate conditional probabilities and to describe situations in set notation. • Drawing cumulative frequency graphs and using them to find medians and interquartile ranges. • Constructing and interpreting frequency polygons • Constructing and comparing box plots

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		and perpendicular line, interpreting y-intercepts and gradients in real life contexts • Solving simultaneous linear and linear/quadratic equations • Plotting quadratic and cubic graphs and finding roots and y-intercepts • Finding the nth term of linear and quadratic sequences Assessment: two x one Hour cumulative assessments	pressure, density and average density or speed Assessment: One Hour Assessment	• Problem solving with compound measures. Assessment: two x one Hour cumulative assessments	• Calculating and estimating averages Assessment: Full GCSE practice exam (2 two-hour papers)

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	Module One	Module Two	Module Three	Module Four	Module Five
Y11	Topics: Number Key Concepts • Estimating answers, limits of accuracy and calculating with bounds • Calculation of error intervals • Multiplication and division with decimals • Powers, roots, negative and fractional indices and manipulating surds. • Performing calculations with numbers in standard form Assessment: One hour assessment	Topics: Algebra Key Concepts • Solving linear and quadratic equations (including involving algebraic fractions) and inequalities • Expanding and factorising linear and quadratic expressions, including difference of two squares. • Expanding triple linear brackets • Solving quadratic equations algebraically and using graphs • Identifying roots and turning points on quadratic graphs • Finding turning points by completing the square • Plotting and recognising linear, quadratic, cubic, reciprocal and exponential functions • Understanding functions, inverse functions and composite functions • Estimating roots of functions using iteration • Transform graphs of functions, and in particular graphs of trigonometric functions • Algebraic proof	Topics: Ratio, Proportion and proportional change Key Concepts • Working with percentages, reverse percentages and repeated percentage change • Problem solving with ratio. • Comparing lengths, areas and volumes using ratio notation; make links to similarity (including trigonometric ratios) and scale factors. • Understanding gradients as rates of change, and areas under speed time graphs as representing distance • Calculating instantaneous rates of change using tangents • Solving problems involving direct and inverse proportion • Recognising and interpreting graphs that illustrate direct and inverse proportion, conversion between units	Topics: Geometry and Measure Key Concepts • Congruence and similarity and transformations review • Angle geometry review. • Vectors and Vector geometry • Working with and problem solving with circle theorems • Area and volume review • Volumes of pyramids and frustra • Working with circles and sectors of circles • Using Pythagoras' Theorem and trigonometry in non- right-angled triangles • Using exact trigonometric ratios • Problem solving with compound measures. • Using straight edge and compass to construct loci Assessment: Two x one-hour papers	Topics: Probability and statistics Key Concepts • Calculating probabilities using tree diagrams, Venn diagrams and sample space diagrams • Understanding theoretical and experimental probabilities and expected and relative frequencies. • Using cumulative frequency graphs and box plots • Using histograms to display continuous data. • Calculating and estimating averages Assessment: Two one-hour papers Followed by external GCSE examination

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		• Understanding equivalence and Identities • Changing the subject (including when expanding and factorising is needed) • Equation of a straight line through two points, parallel and perpendicular line, interpreting y-intercepts and gradients in real life contexts • Solving simultaneous linear and linear/quadratic equations • Finding the nth term of linear and quadratic sequences • Recognise and use the equation of a circle centred at the origin. Assessment: GCSE practice exam: Two 2 hour papers	in compound measure, and solving problems involving compound measure. Assessment: Full GCSE Practice exam		