Year groups:
Y7 started Sept 2022
& 2023

THE BRIAN CLARKE CHURCH OF ENGLAND ACADEMY

Mathematics Department Curriculum Map (Key Stage 4)

At KS4 our curriculum continues and builds on the work done at KS3, preparing students to apply their knowledge with confidence and success at GCSE. Alongside the fundamental topics and concepts, students are taught to problem-solve and connect mathematical ideas together, as well as preparing for final examinations.

Students will study for the Edexcel GCSE Mathematics qualification.

Year 10 Content (higher tier only)

	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Knowledge Introduced	Geometry 4 – Properties of Angles and Polygons • Draw and measure angles, use standard angle vocabulary. • Geometrical proof using properties of angles around a point, angles adjacent on a straight line, vertically opposite angles, interior angle sum of a triangle. • Properties of regular polygons. • Angles and parallel lines. • Interior/exterior angles in polygons. Statistics 1.1 – Discrete Data and Representations • Types of data, collecting data and sampling. • Frequency tables. • Pictograms, line & bar graphs. • Pie charts • Choose appropriate statistical measures and representations. • Compare data sets. Statistics 1.2 –Summary Statistics • Mean, median, mode & range from un-grouped discrete data. • Using summary statistics to compare and analyse data. • Summary statistics from frequency tables. • Misleading data	Number 7 - Standard Form • Be able to write any integer using powers of 10. • Writing large & small numbers in standard form. • Changing numbers that are almost in standard form. • Calculating with numbers in standard form. Geometry 5 – Constructions • Constructing triangles. • Perpendicular bisector of a line. • Perpendicular to a given line through a given point. • Angle bisector. • Loci Geometry 6 – Similarity, Congruence and Pythagoras' Theorem • Properties of similar shapes. • Criteria for congruent triangles. • Using Pythagoras' theorem to identify and find missing sides of right-angled triangles. • Use and apply Pythagoras' theorem to solve problems in a range of contexts.	Algebra 7 – Sequences • Quadratic sequences Probability 1 • Probability language • Probability outcomes, events and experiments • Use diagrams and sets to represent outcomes of theoretical probabilities (trees, two-way tables) • Calculate probabilities of single and combined events • Sum of probabilities of all possible outcomes • Experimental probability • Combined events & Venn diagrams Statistics 2 – Bivariate data • Construct scatter graphs. • Recognise relationships between bivariate data. • Correlation. • Correlation vs causation. • Lines of best fit. • Interpolate and extrapolate apparent trends.	Algebra 8 – Expressions and formulae • Product of two binomials (double bracket expansion and factorisation) [factorise $ax^2 + bx + c$] • Difference of two squares and completing the square. • Rearranging formulae to change the subject. • Products of more than two binomials. Geometry 7 – Trigonometry • The unit circle. • Know how the sine, cosine and tangent ratios are derived from the sides of a right-angled triangle. • Use trigonometric ratios to find a missing side in a right-angled triangle. • Use trigonometric ratios to find a missing angle in a right-angled triangle.	Algebra 9 - Quadratics • Quadratic graphs. • Solve quadratic equations through factorising, completing the square and the quadratic formula. • Solving quadratic equations which require rearrangement. Number 8 - Indices and Surds • Use index laws. • Calculate values using negative and fractional indices. • Manipulate surds including working with brackets and rationalising.	Statistics 3 - Averages and Quartiles • Use lists, tables or diagrams to work out mean, median, mode, range and interquartile range. • Work out averages of grouped data. Algebra 10 - Graphical representations 2 • Using the intersection of linear graphs to solve simultaneous equations (incl. linear/quadratic) • Non-linear graphs (cubic, reciprocal, exponential, trigonometric). • Sketching, plotting, reading, using and key features of quadratic graphs. • Read and interpret points from a graph to solve problems. • Graphs in real life contexts: SDT, 'container' type graphs and applications of quadratic and exponential graphs.

Year 11 Content (higher tier only)

	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Knowledge Introduced	Statistics 4 - Statistical Graphs • Histograms, cumulative frequency graphs, box plots, • Compare distributions to make decisions about a hypothesis. Algebra 11 - Simultaneous Equations • Form and solve simultaneous linear equations by elimination and substitution. • Solve simultaneous equations where one is linear, and one is quadratic. Geometry 8 - Arcs, Sectors and Segments • Calculate arc lengths and sector area. • Work out missing values when given lengths or areas. Number 9 - Ratio • Combining ratios, finding parts, differences and wholes; mixing ratios with fractions (part/part and part/whole) • Use ratio to solve geometric, statistical and number problems. • Use ratio to solve problems that involve algebraic manipulation. • Use ratio for rates of change and map/scale problems. • Represent ratios as straight-line graphs. Algebra 12 - Straight Line Graphs • Work out the gradient between two points. • Work with parallel and perpendicular lines and gradients.	Geometry 9 - Congruence and Similarity • Compare lengths, areas and volumes of similar shapes. • Enlargements with negative scale factors. Number 10 - Growth and Decay • Simple and compound interest problems. • Direct and inverse proportion • Compound measures Probability 2 • Systematic listing strategies • Conditional probability and tree diagrams. Geometry 10 - Advanced trigonometry • Exact values. • 3D Pythagoras' theorem and trigonometry. • Sine rule & Cosine rule. • Calculate the area of triangle using the sine rule for area. Algebra 13 - Equations and inequalities • Solve linear and quadratic inequalities. • Inequalities on a coordinate grid and using set notation.	Geometry 11 - Surface area and volume • Work out the surface area & volume of solids including cones, spheres, pyramids and compound solids. Number 11 - Bounds • Combine upper and lower bounds appropriately to achieve an overall maximum or minimum for a situation. • Use inequality notation to specify error intervals due to truncation. Algebra 14 - Algebraic Fractions • Simplify algebraic fractions and use the four operations. • Solve equations & rearrange formulae using algebraic fractions. Algebra 15 - Identities and proofs • Recognise identities and work out missing coefficients. • Prove and disprove statements and formulae. • Convert recurring decimals to fractions. Geometry 12 - Circle Theorems • Understand and use all circle theorems. • Circle theorem proofs.	Algebra 16 - Functions and Iterations • Understand and use function notation. • Understand and use composite and inverse functions. • Trial & improvement. • Iteration. Geometry 13 - Vectors • Calculate and represent graphically the sum and difference of two vectors and a scalar multiple of a vector. • Calculate the resultant of two vectors. • Solve geometric problems in 2D using vector methods. Algebra 17 - Graphs and transformations • Combinations of transformations. • Transform the graph of any function. • Recognise transformation of functions. Algebra 18 - Area under and gradient of a curve • Calculate the area under a linear graph. • Estimate the gradient at a point on a curve. • Interpret a gradient curve. • Estimate area under a curve. Algebra 19 - Circles & Tangents • Recognise and write down the equation of a circle. • Intersections of circles and lines. • Equation of a tangent.	Targeted consolidation, revision & exam preparation.	Targeted consolidation, revision & exam preparation.