

Beths Grammar School KS4 Maths Curriculum Map – Year 10

Term	INTENT	IMPLEMENTATION	IMPACT
	Substantive Knowledge This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.	Disciplinary Knowledge (Skills) This is the action taken within a particular topic in order to gain substantive knowledge.	Assessment opportunities What assessments will be used to measure student progress? Evidence of how well students have learned the intended content.
Autumn Term 1A Year 10	<u>Chapter 1 Number</u> 1.1 Number problems and reasoning 1.2 Place value and estimating 1.3 HCF and LCM 1.4 Calculating with powers (indices) 1.5 Zero, negative and fractional indices 1.6 Powers of 10 and standard form 1.7 Surds	<u>Chapter 1 Number</u> - Use pictures or lists to help you to solve problems - Work out the total number of ways of performing a series of tasks - Estimate an answer - Use place value to answer questions - Write a number as the product of its prime factors - Find the HCF and LCM of two numbers - Use powers and roots in calculations - Multiply and divide using index laws - Work out a power raised to a power - Use negative indices - Use fractional indices - Write a number in standard form - Calculate with numbers in standard form - Understand the difference between rational and irrational numbers - Simplify a surd - Rationalise a denominator	- In class teacher assessment through Q&A - End of chapter mini test (with peer marking) - Checkup/Strengthen/Extend exercises at the end of every chapter - End of unit test provided in the book - Formal Trial exams

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	<u>Chapter 2 Algebra</u> • 2.1 Algebraic indices • 2.2 Expanding and factorising • 2.3 Equations • 2.4 Formulae • 2.5 Linear Sequences • 2.6 Non-linear sequences • 2.7 More expanding and factorising	<u>Chapter 2 Algebra</u> • Use the rules of indices to simplify algebraic expressions • Expand brackets • Factorise algebraic expressions • Solve equations involving brackets and numerical fractions • Use equations to solve problems • Substitute numbers into formulae • Rearrange formulae • Distinguish between expressions, equations, formulae and identities • Find the general term or nth term of an arithmetic sequence • Determine whether a particular number is a term of a given arithmetic sequence • Solve problems using geometric sequences • Work out terms in Fibonacci sequences • Find the nth term of a quadratic sequence • Expand the product of two brackets • Use the difference of two squares • Factorise quadratic expressions of the form x^2+bx+c	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Checkup/Strengthen/Extend exercises at the end of every chapter • End of unit test provided in the book • Formal Trial exams
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Autumn Term 1B Year 10	<u>Chapter 3 Interpreting and representing data</u> • 3.1 Statistical Diagrams 1 • 3.2 Time series • 3.3 Scatter graphs • 3.4 Line of best fit • 3.5 Averages and range • 3.6 Statistical diagrams 2 <u>Chapter 4 Fractions, ratios and percentages</u> • 4.1 Fractions • 4.2 Ratios • 4.3 Ratios and proportion • 4.4 Percentages • 4.5 Fractions, decimals and percentages	<u>Chapter 3 Interpreting and representing data</u> • Construct and use back-to-back stem and leaf diagrams • Construct and use frequency polygons and pie charts • Plot and interpret time series graphs • Use trends to predict what might happen in the future • Plot and interpret scatter graphs • Determine whether there is a linear relationship between two variables • Draw a line of best fit on a scatter graph • Use the line of best fit to predict values • Decide which average is best for a set of data • Estimate the mean and range from a grouped frequency table • Find the modal class and the class containing the median • Construct and use two-way tables • Choose appropriate diagrams to display data • Recognise misleading graphs <u>Chapter 4 Fractions, ratios and percentages</u> • Add subtract, multiply and divide fractions and mixed numbers • Find the reciprocal of an integer, decimal or fraction • Write ratios in the form 1:n or n:1 • Compare ratios • Find quantities using ratios • Solve problems involving ratios • Use bar models to help solve problems • Convert between currencies and measures • Recognise and use direct proportion • Solve problems involving ratios and proportion • Calculate using percentages and ratios • Work out percentage increases and decreases • Solve real-life problems involving percentages • Calculate using fractions, decimals and percentages • Convert a recurring decimal to a fraction	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Checkup/Strengthen/Extend exercises at the end of every chapter • End of unit test provided in the book • Formal Trial exams • In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Checkup/Strengthen/Extend exercises at the end of every chapter • End of unit test provided in the book • Formal Trial exams
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Spring Term 2A Year 10	<u>Chapter 5 Angles and Trigonometry</u> • 5.1 Angle properties of triangles and quadrilaterals • 5.2 Interior angles of a polygon • 5.3 Exterior angles of a polygon • 5.4 Pythagoras' Theorem 1 • 5.5 Pythagoras Theorem 2 • 5.6 Trigonometry 1 • 5.7 Trigonometry 2	<u>Chapter 5 Angles and Trigonometry</u> • Derive and use the sum of angles in a triangle and in a quadrilateral • Derive and use the fact that the exterior angle of a triangle is equal to the sum of the two opposite interior angles • Calculate the sum of the interior angles of a polygon • Use the interior angles of polygons to solve problems • Use x for the unknown to help you solve problems • Know the sum of the exterior angles of a polygon • Use the angles of polygons to solve problems • Calculate the length of the hypotenuse in a right-angled triangle • Solve problems using Pythagoras' theorem • Calculate the length of a shorter side in a right-angled triangle • Solve problems using Pythagoras' theorem • Use the trigonometric ratios to find lengths in a right-angled triangle • Use trigonometric ratios to solve problems • Find angles of elevation and angles of depression • Use trigonometric ratios to calculate an angle in a right-angled triangle • Use trigonometric ratios to solve problems • Know the exact values of the sine, cosine and tangent of some angles	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Checkup/Strengthen/Extend exercises at the end of every chapter • End of unit test provided in the book • Formal Trial exams
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	<u>Chapter 6 Graphs</u> • 6.1 Linear graphs • 6.2 More linear graphs • 6.3 Graphing rates of change • 6.4 Real-life graphs • 6.5 Line segments • 6.6 Quadratic graphs • 6.7 Cubic and reciprocal graphs • 6.8 More graphs	<u>Chapter 6 Graphs</u> • Find the gradient and y-intercept from a linear equation • Rearrange an equation into the form $y=mx+c$ • Compare two graphs from their equations • Plot graphs with equation $ax+by=c$ • Sketch graphs using the gradient and intercepts • Find the equation of a line, given its gradient and one point on the line • Find the gradient of a line through two points • Draw and interpret distance-time graphs • Calculate average speed from a distance-time graph • Understand velocity-time graphs • Find acceleration and distance from velocity-time graphs • Draw and interpret real-life linear graphs • Recognise direct proportion • Draw and use a line of best fit • Find the coordinates of the midpoint of a line segment • Find the gradient and length of a line segment • Find the equations of lines parallel or perpendicular to a given line • Draw quadratic graphs • Solve quadratic equations using graphs • Identify the line of symmetry of a quadratic graph • Interpret quadratic graphs relating to real-life situations • Draw graphs of cubic functions • Solve cubic equations using graphs • Draw graphs of reciprocal functions • Recognise a graph from its shape • Interpret linear and non-linear real-life graphs • Draw the graph of a circle	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Checkup/Strengthen/Extend exercises at the end of every chapter • End of unit test provided in the book • Formal Trial exams
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Spring Term 2B Year 10	<u>Chapter 7 Areas and Volume</u> • 7.1 Perimeter and area • 7.2 Units and accuracy • 7.3 Prisms • 7.4 Circles • 7.5 Sectors of circles • 7.6 Cylinders and spheres • 7.7 Pyramids and cones	<u>Chapter 7 Areas and Volume</u> • Find the area and perimeter of compound shapes • Recall and use the formula for area of a trapezium • Convert between metric units of area • Write error intervals for rounded values • Calculate upper and lower bounds • Convert between metric units of volume • Calculate volumes and surface areas of prisms • Calculate the area and circumference of a circle • Calculate area and circumference in terms of pi • Calculate the perimeter and area of semicircles and quarter circles • Calculate arc lengths, angles and areas of sectors of circles • Calculate volume and surface area of a cylinder and a sphere • Solve problems involving volumes and surface areas • Calculate volume and surface area of pyramids and cones • Use flow diagram to help you solve problems	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Checkup/Strengthen/Extend exercises at the end of every chapter • End of unit test provided in the book • Formal Trial exams
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	<u>Chapter 8 Transformations and constructions</u> • 8.1 3D solids • 8.2 Reflection and rotation • 8.3 Enlargement • 8.4 Translations & combinations of different transformations • 8.5 Scale drawings and bearings • 8.6 Constructions 1 • 8.7 Constructions 2 • 8.8 Loci	<u>Chapter 8 Transformations and constructions</u> • Draw plans and elevations of 3D solids • Reflect a 2D shape in a mirror line • Rotate a 2D shape about a centre of rotation • Describe reflections and rotations • Carry out and describe combinations of reflections • Enlarge shapes by fractional and negative scale factors about a centre of enlargement • Translate a shape using a vector • Carry out and describe combinations of different transformations • Draw and use scales on maps and scale drawings • Solve problems involving bearings • Construct triangles using a ruler and compasses • Construct the perpendicular bisector of a line • Construct the shortest distance from a point to a line using a ruler and compasses • Bisect an angle using a ruler and compasses • Construct angles using a ruler and compasses • Construct shapes made from triangles using a ruler and compasses • Draw a locus • Use loci to solve problems	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Checkup/Strengthen/Extend exercises at the end of every chapter • End of unit test provided in the book • Formal Trial exams
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Summer Term 3A Year 10	<u>Chapter 9 Equations and Inequalities</u> • 9.1 Solving linear inequalities • 9.2 Solving quadratic equations 1 • 9.3 Solving quadratic equations 2 • 9.4 Completing the square • 9.5 Solving simple simultaneous equations • 9.6 More simultaneous equations • 9.7 Solving quadratic simultaneous equations	<u>Chapter 9 Equations and Inequalities</u> • Solve inequalities and show the solution on a number line using set notation • Rearrange and solve quadratic equations • Find the roots of quadratic equations • Solve more complex quadratic equations • Use the quadratic formula to solve a quadratic equation • Complete the square for a quadratic expression • Solve quadratic equation by completing the square • Solve simple simultaneous equations • Solve simultaneous equations for real-life situations • Use simultaneous equations to find the equation of a straight line • Solve linear simultaneous equations where both equations are multiplied • Write equations involving two unknowns to describe real-life situations and solve them • Solve simultaneous equations with one quadratic equation	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Checkup/Strengthen/Extend exercises at the end of every chapter • End of unit test provided in the book • Formal Trial exams
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	<u>Chapter 10 Probability</u> • 10.1 Combined events • 10.2 Mutually exclusive events • 10.3 Experimental probability • 10.4 Independent events and tree diagrams • 10.5 Conditional probability • 10.6 Venn diagrams and set notation	<u>Chapter 10 Probability</u> • Use the product rule for finding the number of outcomes for two or more events • Use two-way tables and sample space diagrams to solve probability problems • Identify mutually exclusive outcomes and events • Find the probabilities of mutually exclusive outcomes and events • Solve probability problems • Estimate the expected results for experimental and theoretical probabilities • Compare real results with theoretical expected values to decide if a game is fair • Draw and use frequency trees • Calculate probabilities of independent events • Use probability tree diagrams to solve problems • Decide if two events are independent • Draw and use tree diagrams to solve conditional probability problems • Use two-way tables to calculate conditional probability • Use set notation • Use Venn diagrams to solve conditional probability problems	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Checkup/Strengthen/Extend exercises at the end of every chapter • End of unit test provided in the book • Formal Trial exams
Summer Term 3B Year	<u>Chapter 11 Multiplicative reasoning</u> • 11.1 Growth and decay • 11.2 Compound measures • 11.3 More compound measures • 11.4 Ratio and proportion	<u>Chapter 11 Multiplicative reasoning</u> • Find an amount after repeated percentage changes • Solve growth and decay problems • Solve problems using an iterative process • Calculate rates • Convert between metric speed measures • Use a formula to calculate speed and acceleration • Solve problems involving compound measures • Use relationships involving ratio • Use direct and inverse proportion	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Checkup/Strengthen/Extend exercises at the end of every chapter • End of unit test provided in the book • Formal Trial exams

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	<u>Chapter 12 Similarity and Congruence</u> • 12.1 Congruence • 12.2 Geometric proof and congruence • 12.3 Similarity • 12.4 More similarity • 12.5 Similarity in 3D solids	<u>Chapter 12 Similarity and Congruence</u> • Show that two triangles are congruent • Know the conditions of congruence • Prove shapes are congruent • Solve problems involving congruence • Use geometric sketching to help solve congruency problems • Use the ratio of corresponding sides to work out scale factors • Find missing lengths on similar shapes • Use geometric sketching to help solve similarity problems • Use similar triangles to work out lengths in real life • Use the link between linear scale factor and area scale factor to solve problems • Use the links between scale factors for length, area and volume to solve problems	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Checkup/Strengthen/Extend exercises at the end of every chapter • End of unit test provided in the book • Formal Trial exams
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