

**Beths Grammar School KS4 Mathematics Curriculum Map**

**GCSE Mathematics**

**Exam Board: Edexcel**

Beths Grammar School KS4 Mathematics Curriculum Map

Term	<b>INTENT</b>	<b>IMPLEMENTATION</b>	<b>IMPACT</b>
	<b>Substantive Knowledge</b> This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.	<b>Disciplinary Knowledge (Skills)</b> This is the action taken within a particular topic in order to gain substantive knowledge.	<b>Assessment opportunities</b> What assessments will be used to measure student progress? Evidence of how well students have learned the intended content.
<b>Autumn Term Y11 1A</b>	<p><b>Geometry</b>                      Vectors                      Geometric Proofs</p> <p><b>Algebra</b>                      Reciprocal Graphs                      Exponential Graphs                      Gradient and Area under graphs                      Direct and Inverse Proportion</p>	<ul style="list-style-type: none"> <li>• Understand and use vector notation, including column notation</li> <li>• Understand that <math>2a</math> is parallel to <math>a</math> and twice its length, and that <math>a</math> is parallel to <math>-a</math> in the opposite direction.</li> <li>• Represent vectors, combinations of vectors and scalar multiples in the plane pictorially.</li> <li>• Calculate the sum of two vectors, the difference of two vectors and a scalar multiple of a vector using column vectors (including algebraic terms).</li> <li>• Find the length of a vector using Pythagoras' Theorem.</li> <li>• Calculate the resultant of two vectors.</li> <li>• Find the length of a vector using Pythagoras' Theorem.</li> <li>• Calculate the resultant of two vectors.</li> <li>• Produce geometrical proofs to prove points are collinear and vectors/lines are parallel.</li> <li>• Recognise, sketch and interpret graphs of the reciprocal function <math>y = 1/x</math> with <math>x \neq 0</math></li> <li>• State the value of <math>x</math> for which the equation is not defined;</li> <li>• Recognise, sketch and interpret graphs of exponential functions <math>y = k^x</math> for positive values of <math>k</math> and integer values of <math>x</math>;</li> <li>• Interpret and analyse transformations of graphs of functions and write the functions algebraically, e.g. write the equation of <math>f(x) + a</math>, or <math>f(x - a)</math>:</li> <li>• apply to the graph of <math>y = f(x)</math> the transformations <math>y = -f(x)</math>, <math>y = f(-x)</math> for linear, quadratic, cubic functions;</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge recall starter activity</li> <li>• Homework to develop fluency, problem solving, reasoning and mastery</li> <li>• Teacher assessment during lesson</li> <li>• Unit revision exercise via textbook</li> <li>• Mymaths mastery homework</li> <li>• End of unit assessments</li> </ul>

Beths Grammar School KS4 Mathematics Curriculum Map

		<ul style="list-style-type: none"> <li>• apply to the graph of <math>y = f(x)</math> the transformations <math>y = f(x) + a</math>, <math>y = f(x + a)</math> for linear, quadratic, cubic functions;</li> <li>• Estimate area under a quadratic or other graph by dividing it into trapezia;</li> <li>• Interpret the area under a linear or non-linear graph in real-life contexts;</li> <li>• Interpret the gradient of non-linear graph in curved distance–time and velocity–time graphs:</li> <li>• Interpret the gradient of a linear or non-linear graph in financial contexts;</li> <li>• Interpret the rate of change of graphs of containers filling and emptying;</li> <li>• Interpret the rate of change of unit price in price graphs.</li> <li>• Recognise and interpret graphs showing direct and inverse proportion;</li> <li>• Identify direct proportion from a table of values, by comparing ratios of values, for <math>x</math> squared and <math>x</math> cubed relationships;</li> <li>• Set up and use equations to solve word and other problems involving direct proportion;</li> <li>• Use <math>y = kx</math> to solve direct proportion problems, including questions where students find <math>k</math>, and then use <math>k</math> to find another value;</li> <li>• Solve problems involving inverse proportionality;</li> </ul>	
<p><b>Autumn Term 1B</b></p>	<p><b>Geometry</b>  Interior/Exterior Angles  Trigonometry  Area/Perimeter of Circles  Surface Area  Volume</p>	<ul style="list-style-type: none"> <li>• Understand the difference between regular and irregular polygons</li> <li>• Use the sum of interior angles to find missing angles of polygons</li> <li>• Use the sum of exterior angles to find missing angles</li> <li>• Use sum of exterior angles to find how many sides a regular polygon has</li> <li>• Use SOHCAHTOA to find a missing angle in a right-angled triangle</li> <li>• Find angles of elevation and depression</li> <li>• Use SOHCAHTOA to find a missing side in a right-angled triangle</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge recall starter activity</li> <li>• Homework to develop fluency, problem solving, reasoning and mastery</li> <li>• Teacher assessment during lesson</li> <li>• Unit revision exercise via textbook</li> <li>• Mymaths mastery homework</li> <li>• End of unit assessments</li> <li>• December Trial Exams</li> </ul>

Beths Grammar School KS4 Mathematics Curriculum Map

		<ul style="list-style-type: none"> <li>• Derive the exact values of sin, cos and tan for the following angles: 0, 30, 45, 60 and 90</li> <li>• Calculate with exact values</li> <li>• Name parts of a circle</li> <li>• Find the circumference of a circle</li> <li>• Find the radius/diameter when given the circumference</li> <li>• Find the area of a circle</li> <li>• Find the radius/diameter when given the area</li> <li>• Find the area of compound shapes that involved circles</li> <li>• Find arc length of a sector</li> <li>• Find the area of a sector</li> <li>• Find the radius/diameter when given the arc length or area of a sector</li> <li>• Identify and sketch 3D shapes</li> <li>• Identify planes of symmetry</li> <li>• Find the surface area of prisms (cube, cuboid, triangular)</li> <li>• Find the surface area of cylinders</li> <li>• Find the surface area of spheres</li> <li>• Find the surface area of pyramids</li> <li>• Find the surface area of cones</li> <li>• Find the volume of prisms (cube, cuboid, triangular, cylinder)</li> <li>• Find the volume of spheres</li> <li>• Find the volume of pyramids</li> <li>• Find the volume of cones</li> <li>• Find the volume of frustums</li> <li>• Solve problems that involve surface area</li> <li>• Solve problems that involve volume</li> </ul>	
<p><b>Spring Term 2A</b></p>	<p><b><u>Number</u></b>  Indices  Standard Form  Combinations  Error Intervals/Truncating</p> <p><b><u>Algebra</u></b>  Linear Sequences  Quadratic Sequences</p>	<ul style="list-style-type: none"> <li>• State and apply the laws of indices</li> <li>• Simplify an expression involving indices</li> <li>• State and apply the definitions of zero and negative indices</li> <li>• Express and compare numbers in standard form</li> <li>• Calculate using numbers in standard form</li> <li>• Calculate upper and lower bounds of numbers due to rounding and truncating</li> <li>• Use upper and lower bounds in calculations</li> <li>• Recognise number patterns and sequences</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge recall starter activity</li> <li>• Homework to develop fluency, problem solving, reasoning and mastery</li> <li>• Teacher assessment during lesson</li> <li>• Unit revision exercise via textbook</li> <li>• Mymaths mastery homework</li> <li>• End of unit assessments</li> </ul>

## Beths Grammar School KS4 Mathematics Curriculum Map

	Geometric Sequences	<ul style="list-style-type: none"> <li>• Find the terms of a sequence using a term-to-term rule</li> <li>• Recognise arithmetic and geometric sequences</li> <li>• Find terms of a sequence using a position-to-term rule</li> <li>• Find the formula for the general (nth) term of a sequence</li> <li>• Solve problems involving number patterns and sequence</li> </ul>	
<b>Spring Term 2B</b>	<p><b>Revision</b> Recap prior topics Develop exam skills Enhance problem solving</p>	<ul style="list-style-type: none"> <li>• Ensure students have a solid grasp of fundamental principles and theories</li> <li>• Practice solving a variety of problems to enhance analytical and logical reasoning skills</li> <li>• Be proficient in rearranging and solving different types of equations</li> <li>• Recap how to read and interpret data from various types of graphs and charts</li> <li>• Develop quick mental calculation abilities for basic operations</li> <li>• Master simplifying expressions, expanding brackets, and factorising</li> <li>• Understand properties of shapes, theorems and proofs</li> <li>• Recap how to compute and interpret measures of central tendency and spread</li> <li>• Enhance ability to follow and construct logical arguments and proofs</li> <li>• Practice pacing during exams and working efficiently under time constraints</li> <li>• Develop the ability to identify and learn from mistakes in practice problems</li> <li>• Get comfortable with using calculators efficiently</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge recall starter activity</li> <li>• Homework to develop fluency, problem solving, reasoning and mastery</li> <li>• Teacher assessment during lesson</li> <li>• Unit revision exercise via textbook</li> <li>• Mymaths mastery homework</li> <li>• End of unit assessments</li> <li>• February Trial Exams</li> </ul>
<b>Summer Term 3A</b>	<p><b>Revision</b> Recap prior topics Develop exam skills Enhance problem solving</p>	<ul style="list-style-type: none"> <li>• Ensure students have a solid grasp of fundamental principles and theories</li> <li>• Practice solving a variety of problems to enhance analytical and logical reasoning skills</li> <li>• Be proficient in rearranging and solving different types of equations</li> <li>• Recap how to read and interpret data from various types of graphs and charts</li> <li>• Develop quick mental calculation abilities for basic operations</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge recall starter activity</li> <li>• Homework to develop fluency, problem solving, reasoning and mastery</li> <li>• Teacher assessment during lesson</li> <li>• Unit revision exercise via textbook</li> <li>• Mymaths mastery homework</li> <li>• End of unit assessments</li> </ul>

**Beths Grammar School KS4 Mathematics Curriculum Map**

		<ul style="list-style-type: none"><li>• Master simplifying expressions, expanding brackets, and factorising</li><li>• Understand properties of shapes, theorems and proofs</li><li>• Recap how to compute and interpret measures of central tendency and spread</li><li>• Enhance ability to follow and construct logical arguments and proofs</li><li>• Practice pacing during exams and working efficiently under time constraints</li><li>• Develop the ability to identify and learn from mistakes in practice problems</li><li>• Get comfortable with using calculators efficiently</li></ul>	
--	--	--	--