



Year 10 Maths Curriculum Map

<p>Overview</p>	<p>Our GCSE course begins at this point. Our curriculum is tailored to meet students' needs according to prior attainment. Learners follow either the Higher or Foundation pathway, although we allow for mobility between these tiers through the course. The Scheme of Work builds and extends from Key Stage 3 across all strands. Students will continue to develop a greater understanding of how topics relate and intertwine across the syllabus. In Year 10 our higher attainers have the opportunity to start a two year Free Standing Maths Qualification alongside their GCSE studies. The higher and foundation tier schemes of work are shown below – knowledge required only on the higher tier are emboldened.</p>		
<p>Year 10</p>	<p>Autumn 1 & 2</p>	<p>Spring 1 & 2</p>	<p>Summer 1 & 2</p>
<p>Topic</p>	<p>Unit 1: Number Unit 2: Algebra Unit 3: Dealing with data Unit 4: Fractions, ratio, percentage Unit 5: Angles & trigonometry</p>	<p>Unit 6: Graphs Unit 7: Area & volume Unit 8: Transformations & construction Unit 9: Equations & inequalities Unit 10: Probability</p>	<p>Unit 11: Multiplicative reasoning Unit 12: Similarity & congruence Unit 13: Further trigonometry Unit 14: Further statistics Unit 15: Equations & graphs</p>
<p>Knowledge</p>	<p>Our learners can: 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 of 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. 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.</p> <p>Use the rules of indices to simplify algebraic expressions. Expand two and three brackets. Factorise algebraic expressions.</p>	<p>Our learners can: Find the gradient and y-intercept from a linear equation. Rearrange equations into the form $y = mx + c$. Compare two graphs from their equations. Plot graphs with equations $ax + by = c$. 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.</p>	<p>Our learners can: Find an amount after repeated percentage changes. Solve growth and decay problems. Calculate rates. Convert between metric speed measures. (m/s to km/h etc) Use a formula to calculate speed and acceleration. Solve problems involving compound measures. Use relationships involving ratio. Use direct and indirect proportion.</p> <p>Show that two triangles are congruent. Know the conditions of congruence. Prove shapes are congruent. Solve problems involving congruence. Use the ratio of corresponding sides to work out scale factors. Find missing lengths on similar shapes. Use similar triangles to work out lengths in</p>

<p>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 a general formula for the 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-like sequences. Find the nth term of a quadratic sequence. Use the difference of two squares. Factorise quadratics of the form $x^2 + bx + c$.</p> <p>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 or not 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 group containing the median. Construct and use two-way tables. Choose appropriate diagrams to display data. Recognise misleading graphs.</p> <p>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.</p>	<p>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.</p> <p>Find the perimeter and area of compound shapes. Recall and use the formula for the area of a trapezium. Convert between metric units of area. Calculate the maximum and minimum possible values of a measurement. Convert between metric units of volume. Calculate volumes and surface areas of prisms. Calculate the area and circumference of a circle. Calculate area & circumference in terms of π. 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. Solve problems involving pyramids and cones.</p> <p>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. 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 transformations. Draw and use scales on maps & 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 & compasses.</p>	<p>real life. Use the link between linear scale factor and area scale factor to solve problems. Use the link between scale factors for length, area and volume to solve problems.</p> <p>Understand and use upper and lower bounds in calculations involving trigonometry. Understand how to find the sine of any angle. Know the graph of the sine function and use it to solve equations. Understand how to find the cosine of any angle. Know the graph of the cosine function and use it to solve equations. Understand how to find the tangent of any angle. Know the graph of the tangent function and use it to solve equations. Find the area of a triangle and a segment of a circle. Use the sine & cosine rule to solve 2D problems. Solve bearings problems using trigonometry. Use Pythagoras' theorem in 3D. Use trigonometry in 3D. Recognise how changes in a function affect trigonometric graphs.</p> <p>Understand how to take a simple random sample. Understand how to take a stratified sample. Draw and interpret cumulative frequency tables and diagrams. Work out the median, quartiles and interquartile range from a cumulative frequency diagram. Find the quartiles and the interquartile range from stem-and-leaf diagrams. Draw and interpret box plots. Understand frequency density. Draw histograms. Interpret histograms.</p>
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Find quantities using ratios.
Solve problems involving ratios.
Convert between currencies and measures.
Recognise and use direct proportion.
Solve problems involving ratios and proportion.
Work out percentage increases and decreases.
Solve real-life problems involving percentages.

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.
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.
Calculate the length of a shorter side in a right-angled triangle.
Solve problems using Pythagoras' theorem.
Use trigonometric ratios to find lengths in a right-angled triangle.
Use trigonometric ratios to solve problems.
Use trigonometric ratios to calculate an angle in a right-angled triangle.
Find angles of elevation and angles of depression.
Use trigonometric ratios to solve problems.
Know the exact values of the sine, cosine and tangent of some angles.

Construct shapes made from triangles using a ruler and compasses.
Draw and use loci to solve problems.

Find the roots of quadratic functions.
Rearrange and solve simple 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 equations by completing the square.
Solve simple simultaneous equations.
Solve simultaneous equations for real-life situations.
Interpret real-life situations involving two unknowns and solve them.
Solve simultaneous equations with one quadratic equation.
Use real-life situations to construct quadratic and linear equations and solve them.
Solve inequalities and show the solution on a number line and using set notation.

Use the product rule for finding the number of outcomes for two or more events.
List all the possible outcomes of two events in a sample space diagram.
Identify mutually exclusive outcomes and events.
Find the probabilities of mutually exclusive outcomes and events.
Find the probability of an event not happening.
Work out the expected results for experimental and theoretical probabilities.
Compare real results with theoretical expected values to see if a game is fair.
Draw and use frequency trees.
Calculate probabilities of repeated events.
Draw and use probability tree diagrams.
Decide if two events are independent.
Draw and use tree diagrams to calculate conditional probability.
Draw and use tree diagrams without replacement.
Use two-way tables to calculate conditional probability.
Use Venn diagrams to calculate conditional probability.
Use set notation.

Compare two sets of data.

Solve simultaneous equations graphically.
Represent inequalities on graphs.
Interpret graphs of inequalities.
Recognise and draw quadratic functions.
Find approximate solutions to quadratic equations graphically.
Solve quadratic equations using an iterative process.
Find the roots of cubic equations.
Sketch graphs of cubic functions.
Solve cubic equations using an iterative process.

Skills	<p>Students will increase their resilience during the course through learning new concepts, using prior knowledge to develop mathematical fluency and applying skills to a variety of situations and problems. Our mathematical activities will have the aim of developing both skills and high aspirations in both this subject and life beyond. Resilience will also be developed within the key maths skills below (fluency, reasoning and problem solving).</p> <p>Students will be given the opportunity to work together to develop and share their ideas on topics, discuss misconceptions and how these topics can be used in real-life situations.</p> <p>Students will develop creativity through a variety of problem solving activities within each topic, working on independent tasks beyond the classroom using HegartyMaths, and apply the key skills (fluency, reasoning and problem solving).</p> <p>Students will also further acquire valuable exam preparation skills – using question level analysis for diagnostic purposes, revision strategy, exam technique and time management.</p>
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