

## Year 10 Maths Curriculum Map

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| <b>Overview</b>   | At the beginning of KS4 classes are further refined, meaning pupils receive even more bespoke teaching for their needs. Pupils continue to study either higher or foundation level courses though there is still movement between the two. 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.   |  |  |
| <b>Year 10</b>    | Autumn 1 & 2  | Spring 1 & 2   | Summer 1 & 2   |
| <b>Topic</b>      | Unit 7: Area & volume<br>Unit 8: Transformations & construction<br>Unit 9: Equations & inequalities   | Unit 10: Probability<br>Unit 11: Multiplicative reasoning<br>Unit 12: Similarity & congruence<br>Unit 13: Further trigonometry   | Unit 14: Further statistics<br>Unit 15: Equations & graphs<br>Unit 16: Circle theorems   |
| <b>Assessment</b> | September – Assessment of units covered in Year 9<br>Christmas – Unit 7-9 Assessment  | Year 10 Exam Week – All GCSE content covered up to this point  | June – All GCSE content covered up to this point   |
| <b>Knowledge</b>  | <p>Our learners can:</p> <p>Find the perimeter and area of compound shapes.<br/>Recall and use the formula for the area of a trapezium.<br/>Convert between metric units of area.<br/>Calculate the maximum and minimum possible values of a measurement.<br/>Convert between metric units of volume.<br/>Calculate volumes and surface areas of prisms.<br/>Calculate the area and circumference of a circle.<br/>Calculate area &amp; circumference in terms of <math>\pi</math>.<br/>Calculate the perimeter and area of semicircles and quarter circles.<br/>Calculate arc lengths, angles and areas of sectors of circles.<br/>Calculate volume and surface area of a cylinder and a sphere.<br/>Solve problems involving volumes and surface areas.<br/>Calculate volume and surface area of pyramids and cones.<br/>Solve problems involving pyramids and cones.</p> | <p>Our learners can:</p> <p><b>Use the product rule for finding the number of outcomes for two or more events.</b><br/><b>List all the possible outcomes of two events in a sample space diagram.</b><br/>Identify mutually exclusive outcomes and events.<br/>Find the probabilities of mutually exclusive outcomes and events.<br/>Find the probability of an event not happening.<br/>Work out the expected results for experimental and theoretical probabilities.<br/>Compare real results with theoretical expected values to see if a game is fair.<br/>Draw and use frequency trees.<br/>Calculate probabilities of repeated events.<br/>Draw and use probability tree diagrams.<br/>Decide if two events are independent.<br/>Draw and use tree diagrams to calculate conditional probability.<br/>Draw and use tree diagrams without replacement.<br/><b>Use two-way tables to calculate conditional probability.</b><br/><b>Use Venn diagrams to calculate conditional probability.</b></p> | <p>Our learners can:</p> <p>Understand how to take a simple random sample.<br/>Understand how to take a stratified sample.<br/><b>Draw and interpret cumulative frequency tables and diagrams.</b><br/><b>Work out the median, quartiles and interquartile range from a cumulative frequency diagram.</b><br/><b>Find the quartiles and the interquartile range from stem-and-leaf diagrams.</b><br/><b>Draw and interpret box plots.</b><br/><b>Understand frequency density.</b><br/><b>Draw histograms.</b><br/><b>Interpret histograms.</b><br/>Compare two sets of data.</p> <p>Solve simultaneous equations graphically.<br/>Represent inequalities on graphs.<br/>Interpret graphs of inequalities.<br/>Recognise and draw quadratic functions.<br/>Find approximate solutions to quadratic</p> |

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|  | <p>Draw plans and elevations of 3D solids.<br/> Reflect a 2D shape in a mirror line.<br/> Rotate a 2D shape about a centre of rotation.<br/> Describe reflections and rotations.<br/> Enlarge shapes by fractional and <b>negative scale factors</b> about a centre of enlargement.<br/> Translate a shape using a vector.<br/> <b>Carry out and describe combinations of transformations.</b><br/> Draw and use scales on maps &amp; scale drawings.<br/> Solve problems involving bearings.<br/> Construct triangles using a ruler and compasses.<br/> Construct the perpendicular bisector of a line.<br/> Construct the shortest distance from a point to a line using a ruler and compasses.<br/> Bisect an angle using a ruler and compasses.<br/> Construct angles using a ruler &amp; compasses.<br/> Construct shapes made from triangles using a ruler and compasses.<br/> Draw and use loci to solve problems.</p> <p>Find the roots of quadratic functions.<br/> Rearrange and solve simple quadratic equations.<br/> <b>Solve more complex quadratic equations.</b><br/> <b>Use the quadratic formula to solve a quadratic equation.</b><br/> <b>Complete the square for a quadratic expression.</b><br/> <b>Solve quadratic equations by completing the square.</b><br/> Solve simple simultaneous equations.<br/> Solve simultaneous equations for real-life situations.<br/> Interpret real-life situations involving two unknowns and solve them.<br/> <b>Solve simultaneous equations with one quadratic equation.</b><br/> <b>Use real-life situations to construct quadratic and linear equations and solve them.</b><br/> <b>Solve inequalities and show the solution on a number line and using set notation.</b></p> | <p><b>Use set notation.</b><br/> Find an amount after repeated percentage changes.<br/> <b>Solve growth and decay problems.</b><br/> Calculate rates.<br/> Convert between metric speed measures. (m/s to km/h etc)<br/> Use a formula to calculate speed and acceleration.<br/> Solve problems involving compound measures.<br/> Use relationships involving ratio.<br/> Use direct and indirect proportion.</p> <p><b>Show that two triangles are congruent.</b><br/> <b>Know the conditions of congruence.</b><br/> <b>Prove shapes are congruent.</b><br/> <b>Solve problems involving congruence.</b><br/> Use the ratio of corresponding sides to work out scale factors.<br/> Find missing lengths on similar shapes.<br/> Use similar triangles to work out lengths in real life.<br/> Use the link between linear scale factor and area scale factor to solve problems.<br/> Use the link between scale factors for length, area and volume to solve problems.</p> <p><b>Understand and use upper and lower bounds in calculations involving trigonometry.</b><br/> Understand how to find the sine of any angle.<br/> <b>Know the graph of the sine function and use it to solve equations.</b><br/> Understand how to find the cosine of any angle.<br/> <b>Know the graph of the cosine function and use it to solve equations.</b><br/> Understand how to find the tangent of any angle.<br/> <b>Know the graph of the tangent function and use it to solve equations.</b><br/> Find the area of a triangle and a segment of a circle.<br/> Use the sine &amp; cosine rule to solve 2D problems.<br/> Solve bearings problems using trigonometry.<br/> Use Pythagoras' theorem in 3D.<br/> Use trigonometry in 3D.<br/> Recognise how changes in a function affect trigonometric graphs.</p> | <p>equations graphically.<br/> <b>Solve quadratic equations using an iterative process.</b><br/> <b>Find the roots of cubic equations.</b><br/> Sketch graphs of cubic functions.<br/> <b>Solve cubic equations using an iterative process.</b></p> <p><b>Solve problems involving angles, triangles and circles.</b><br/> <b>Solve problems involving chords and radii.</b><br/> <b>Understand and use facts about tangents at a point and from a point.</b><br/> <b>Understand and prove facts about angles subtended at the centre and the circumference of circles.</b><br/> <b>Understand, prove and use facts about the angle in a semicircle being a right angle.</b><br/> <b>Understand, prove and use facts about angles subtended at the circumference of a circle.</b><br/> <b>Understand, prove and use facts about cyclic quadrilaterals.</b><br/> <b>Prove and use the alternate segment theorem.</b><br/> <b>Give reasons for angle sizes using mathematical language.</b><br/> <b>Find the equation of the tangent to a circle at a given point.</b><br/> <b>Sketch a circle from its equation and state the equation of a circle about the origin.</b></p> |
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| <b>Skills</b> | <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 SPARX Maths, 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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