



## Curriculum Map for Foundation Maths Year 10

YEAR 10	Autumn 1	Autumn 2
<b>Topics</b>	<b>Graphs Transformations</b>	<b>Ratio &amp; Proportion</b>
<b>Substantive Knowledge – The Knowledge Taught By The Teacher</b>	<ul style="list-style-type: none"><li>Students will learn about real-life graphs, how to draw and interpret them.</li><li>Students will learn about straight-line graphs, their gradient and y-intercept.</li><li>Students will learn about translations, rotations, enlargements and reflections and how to combine them.</li></ul>	<ul style="list-style-type: none"><li>Students will learn about ratio, comparing and calculating proportions and displaying on graphs both linear and non-linear.</li></ul>
<b>Disciplinary Knowledge – Concepts, Investigations, Conjecture, Proof, Problem Modelling and Problem Solving</b>	<ul style="list-style-type: none"><li>Understand the link between straight line graphs and real-life interpretation.</li><li>Understand the link between similarity and scale factors.</li></ul>	<ul style="list-style-type: none"><li>Understand and use proportion as equality of ratios.</li><li>Understand the importance of using fractions in ratio problems.</li></ul>
<b>Skills</b>	<ul style="list-style-type: none"><li>Use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate.</li><li>Work with coordinates in all four quadrants.</li><li>Plot graphs of equations that correspond to straight-line graphs in the coordinate plane.</li><li>Express a multiplicative relationship between two quantities as a ratio or a fraction.</li><li>Use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotation symmetries.</li><li>Identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation, reflection, translation and enlargement (including fractional scale factors).</li></ul>	<ul style="list-style-type: none"><li>Use scale factors, scale diagrams and maps.</li><li>Express a multiplicative relationship between two quantities as a ratio or a fraction.</li><li>Relate ratios to fractions and to linear functions.</li></ul>

<b>Links To Prior Learning</b>	<ul style="list-style-type: none"> <li>Building on the Graphs, Tables and Charts unit to further develop on midpoints and line segments, straight line graphs, gradient of lines, manipulating <math>y=mx+c</math> and real-life graphs including distance time graphs.</li> <li>Building on understanding of basic transformations in order to include combined transformations and use scale factors and centre of enlargements and equations of reflection lines.</li> </ul>	<ul style="list-style-type: none"> <li>Building on basic ratio skills in previous years, sharing ratios and solving worded problem.</li> <li>Developing further sharing and comparing ratios in real life context including the unitary method, recognising direct and inverse proportion graphs and solving complex proportion problems.</li> </ul>
<b>Literacy/ Numeracy</b>	<ul style="list-style-type: none"> <li>The language of graphs and transformations.</li> </ul>	<ul style="list-style-type: none"> <li>The language of ratio and proportion.</li> <li>Language of ratio</li> </ul>
<b>Cross Curricular</b>	<ul style="list-style-type: none"> <li>Any area which uses linear graphs to display results/data such as Science.</li> <li>Any area which transforms shapes such as Art.</li> </ul>	<ul style="list-style-type: none"> <li>Any area which uses ratio and proportion such as Science, Geography and Technology.</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>Learning checks throughout with low stakes questioning and starters.</li> <li>Summative assessment at the end of the topic.</li> </ul>	<ul style="list-style-type: none"> <li>Learning checks throughout with low stakes questioning and starters.</li> <li>Summative assessment at the end of the topic.</li> </ul>

<b>YEAR 10</b>	<b>Spring 1</b>	<b>Spring 2</b>
<b>Topics</b>	<b>Right Angled Triangles: Pythagoras &amp; Trigonometry Probability</b>	<b>Multiplicative Reasoning</b>
<b>Substantive Knowledge – The Knowledge Taught By The Teacher</b>	<ul style="list-style-type: none"> <li>Students will learn about Pythagoras' Theorem and how to apply it in right-angled triangles.</li> <li>Students will learn about Trigonometry and how to apply it to calculate lengths and angles in right-angled triangles.</li> <li>Students will learn about calculating probabilities for combined events and experimental probability.</li> <li>Students will learn about Venn diagrams.</li> </ul>	<ul style="list-style-type: none"> <li>Students will learn about percentage change and multipliers.</li> <li>Students will learn about the compound measures of density, pressure and speed and their units.</li> </ul>
<b>Disciplinary Knowledge – Concepts, Investigations, Conjecture, Proof, Problem Modelling and Problem Solving</b>	<ul style="list-style-type: none"> <li>Understand the link between sides and angles in triangles.</li> <li>Understand that length is connected with the opposite angle in a triangle.</li> <li>Understand that probability can be applied to more than one event.</li> <li>Understand that probability can be found from tree diagrams and Venn diagrams.</li> </ul>	<ul style="list-style-type: none"> <li>Understand that formulae needs to be rearranged changing the subject of a formula to solve problems.</li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>Know the formulae for: Pythagoras' Theorem <math>a^2 + b^2 = c^2</math> and the trigonometric ratios, sine, cosine and tangent; apply them to find angles and</li> </ul>	<ul style="list-style-type: none"> <li>Use standard units of mass, length, time, money and other measures (including standard compound measures).</li> </ul>

	<p>lengths in right-angled triangles in two dimensional figures.</p> <ul style="list-style-type: none"> <li>• Know the exact values of <math>\sin \theta</math> and <math>\cos \theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ</math> and <math>90^\circ</math>; know the exact value of <math>\tan \theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ</math> and <math>60^\circ</math>.</li> <li>• Make links to similarity (including trigonometric ratios).</li> <li>• Record, describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees.</li> <li>• Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand and use standard mathematical formulae; rearrange formulae to change the subject.</li> <li>• Use compound units such as speed, rates of pay, unit pricing, density and pressure.</li> </ul>
<b>Links To Prior Learning</b>	<ul style="list-style-type: none"> <li>• Building on probability scales and calculating simple probability of independent events, expected probability and finance to further develop understanding of experimental probability.</li> </ul>	<ul style="list-style-type: none"> <li>• Building on calculating percentage of amounts, rearranging equations, distance/speed/time in Year 9.</li> </ul>
<b>Literacy/ Numeracy</b>	<ul style="list-style-type: none"> <li>• The language of Pythagoras and Trigonometry.</li> <li>• The language of probability and sets.</li> </ul>	<ul style="list-style-type: none"> <li>• The language of multiplicative reasoning including growth and decay</li> <li>• The language of compound measures such as speed, distance and time.</li> </ul>
<b>Cross Curricular</b>	<ul style="list-style-type: none"> <li>• Any areas where the calculation of lengths and angles in right angled triangles is required such as Engineering.</li> <li>• Any areas where probability is required such as Business Studies.</li> </ul>	<ul style="list-style-type: none"> <li>• Any areas where compound measures (density, pressure and speed) are used such as Science and Technology.</li> <li>• Any area where volume and capacity are used such as Science and Technology.</li> <li>• Any areas where percentage change is used such as Science, Business Studies and Geography.</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>• Learning checks throughout with low stakes questioning and starters.</li> <li>• Summative assessment at the end of the topic.</li> </ul>	<ul style="list-style-type: none"> <li>• Learning checks throughout with low stakes questioning and starters.</li> <li>• Summative assessment at the end of the topic.</li> </ul>

<b>YEAR 10</b>	<b>Summer 1</b>	<b>Summer 2</b>
<b>Topics</b>	<b>Constructions, Loci &amp; Bearings Quadratics Equations &amp; Graphs</b>	<b>Perimeter, Area &amp; Volume</b>
<b>Substantive Knowledge – The Knowledge Taught By The Teacher</b>	<ul style="list-style-type: none"> <li>• Students will learn about the properties of 3D shapes.</li> <li>• Students will learn to draw and interpret plans and elevations.</li> <li>• Students will learn how to construct and read diagrams accurately using compasses, bearings and scale drawings.</li> </ul>	<ul style="list-style-type: none"> <li>• Students will learn about the length of arc and area of a sector within circles.</li> <li>• Students will learn about the volumes of cylinders, cones, pyramids, spheres and associated composite shapes.</li> </ul>

	<ul style="list-style-type: none"> <li>• Students will learn about locus and how to draw it.</li> <li>• Students will learn about quadratic functions, their factorisation and plotting on graphs.</li> <li>• Students will learn how to solve quadratic equations using factorisation and graphs.</li> </ul>	
<b>Disciplinary Knowledge – Concepts, Investigations, Conjecture, Proof, Problem Modelling and Problem Solving</b>	<ul style="list-style-type: none"> <li>• Understand the link between constructions angles and loci.</li> <li>• Understand the link between 3D and 2D plans and elevations.</li> <li>• Understand the link between quadratic equations and quadratic graphs.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand and use standard mathematical formulae; rearrange formulae to change the subject.</li> <li>• Understand how cross-sectional area links to volume.</li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Use scale factors, scale diagrams and maps.</li> <li>• Use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); use these to construct given figures and solve loci problems; know that the perpendicular distance from a point to a line is the shortest distance to the line.</li> <li>• Construct and interpret plans and elevations of 3D shapes.</li> <li>• Identify and interpret roots, intercepts, turning points of quadratic functions graphically; deduce roots algebraically.</li> <li>• Solve quadratic equations algebraically by factorising; find approximate solutions using a graph.</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate exactly with multiples of <math>\pi</math>.</li> <li>• Identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, tangent, arc, sector and segment.</li> <li>• Know the formulae: circumference of a circle = <math>2\pi r = \pi d</math>, area of a circle = <math>\pi r^2</math>; calculate: perimeters of 2D shapes, including circles; areas of circles and composite shapes; surface area and volume of spheres, pyramids, cones and composite solids.</li> </ul>
<b>Links To Prior Learning</b>	<ul style="list-style-type: none"> <li>• Building on measures and drawing accurate lines and shapes in order to recognise and know properties of 3D shapes, plans and elevations, scale drawings and maps, loci and bearings.</li> <li>• Building on algebraic knowledge from the Algebra and Graphs units.</li> </ul>	<ul style="list-style-type: none"> <li>• Building on previous unit of finding the area of trapeziums, surface area and volume of prisms.</li> </ul>
<b>Literacy/ Numeracy</b>	<ul style="list-style-type: none"> <li>• The language of constructions, loci and bearings.</li> <li>• The language of factorisation, quadratic functions and equations.</li> </ul>	<ul style="list-style-type: none"> <li>• The language of area, volume, capacity and 3D shapes.</li> </ul>
<b>Cross Curricular</b>	<ul style="list-style-type: none"> <li>• Any areas where constructions, loci or bearings are used such as Geography and Technology.</li> <li>• Any areas where quadratics are used such as Technology, Science and Engineering.</li> </ul>	<ul style="list-style-type: none"> <li>• Any areas linked to circles and volumes such as Science, Technology, Architecture and Engineering.</li> </ul>

<b>Assessment</b>	<ul style="list-style-type: none"><li>• Learning checks throughout with low stakes questioning and starters.</li><li>• Summative assessment at the end of the topic.</li></ul>	<ul style="list-style-type: none"><li>• Learning checks throughout with low stakes questioning and starters.</li><li>• Summative assessment at the end of the topic.</li></ul>
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