

## KS4 Foundation Mathematics Big Picture

### Year 10 Foundation Mathematics

Autumn 1 8 weeks	Autumn 2 7 weeks	Spring 1 6 weeks
<p><b>Content</b></p> <p>F1 Solving equations and Rearranging formulae F2 Linear Graphs F3 Linear Simultaneous Equations F4 Volume 2</p> <p><b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test:</p> <ul style="list-style-type: none"> <li>• Solve linear equations in one unknown algebraically</li> <li>• Rearrange formulae to change the subject in a geometrical context</li> <li>• Change the subject of a formula involving the use of square roots and squares</li> <li>• <b>Solve linear equations with the unknown on both sides of the equation</b></li> <li>• <b>Calculate the radius or diameter when Sector area or Arc length is given</b></li> <li>• Plot and read coordinates in all four quadrants</li> <li>• Draw, label and scale axes</li> <li>• Plot straight line graphs</li> <li>• Recognise, sketch and interpret straight line graphs</li> <li>• Find approximate solutions using a graph</li> <li>• Find the coordinates of the midpoint of a line segment</li> <li>• Use real life graphs: ready reckoner graphs, conversion graphs, fuel bills graphs, fixed charge and cost per unit</li> <li>• Identify and interpret gradients and intercepts of straight-line graphs</li> <li>• Identify and interpret gradient from an equation <math>y =</math></li> </ul>	<p><b>Content</b></p> <p>F5 Compound Measures F6 Quadratics - graphical F7 Quadratics - algebraic F8 Further graphs</p> <p><b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test:</p> <ul style="list-style-type: none"> <li>• Interpret distance–time graphs, and calculate: the speed of individual sections, total distance and total time</li> <li>• Change between standard units e.g. time, mass, length, money, volume, area</li> <li>• Change between compound units e.g. speed, rates of pay, prices</li> <li>• Work out time intervals for graph scales</li> <li>• <b>Change between standard units and compound units e.g. density and pressure</b></li> <li>• Recognise, sketch and interpret graphs of quadratic functions</li> <li>• <b>Identify roots, intercepts and turning points of a quadratic function</b></li> <li>• <b>Find approximate solutions using a graph</b></li> <li>• <b>Identify the line of symmetry of a quadratic graph</b></li> <li>• <b>Find roots of a quadratic algebraically by factorisation</b></li> <li>• <b>Recognise and sketch cubic graphs and the reciprocal graph</b></li> <li>• <b>Plot and interpret reciprocal graphs</b></li> <li>• <b>Recognise and interpret graphs that illustrate direct</b></li> </ul>	<p><b>Content</b></p> <p>F9 Probability 2 F10 Statistics 2</p> <p><b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test:</p> <ul style="list-style-type: none"> <li>• Apply systematic listing strategies</li> <li>• Describe probability using the probability scale, tables and frequency trees</li> <li>• Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments</li> <li>• Calculate expected outcomes</li> <li>• Mutually exclusive events sum to one</li> <li>• Experimental and theoretical probability</li> <li>• Use Venn diagrams and appropriate notation</li> <li>• Probability space/sample space diagrams</li> <li>• Find a missing probability from a list or table including algebraic terms</li> <li>• <b>Unbiased samples and effects of increasing sample size</b></li> <li>• <b>Probability tree diagrams for independent and dependent events</b></li> <li>• <b>Calculate the probability of independent and dependent combined events</b></li> <li>• <b>Sets and combinations of sets using Venn diagrams</b></li> <li>• Draw and Interpret frequency tables, bar charts, composite bar charts, pie charts, pictograms, vertical</li> </ul>

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$mx + c$ <ul style="list-style-type: none"> <li>Plot and draw graphs of straight lines in the form <math>ax + by = c</math></li> <li>Find the equation of a straight line from a graph</li> <li>Use <math>y = mx + c</math> to identify parallel lines</li> <li>Find the equation of a line through two given points or -through one point with a given gradient</li> <li>Know that the gradient of a straight line is interpreted as a rate of change</li> <li>Identify and interpret the gradient from an equation <math>ax + by = c</math></li> <li>Solve two simultaneous equations in two variables (linear/linear) algebraically</li> <li>Find approximate solutions using a graph</li> <li>Derive two simultaneous equations, solve the equation and interpret the solution</li> <li>Know and apply formulae to calculate volume of cuboids and other right prisms (including cylinders)</li> <li>Find the volume of spheres, pyramids, cones and composite solids</li> </ul>	<p>and inverse proportion</p>	<ul style="list-style-type: none"> <li>line charts, stem and leaf (including back-to-back stem and leaf)</li> <li>Mean, mode, median, modal class</li> <li>Range and outliers</li> <li>Compare the mean, median, mode and range (as appropriate) of two distributions using bar charts, dual bar charts, pictograms and back-to-back stem and leaf</li> <li>Recognise the advantages and disadvantages between measures of average</li> <li>Scatter graphs - recognise correlation</li> <li>Recognise types of data: primary secondary, quantitative and qualitative</li> <li>Understand sample and population</li> <li>Listing combinations</li> <li>Sampling - infer properties of populations or distributions from a sample, while knowing the limitations of sampling</li> <li>Interpret and construct tables and line graphs for time series data</li> <li>Scatter graphs - draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends while knowing the dangers of doing so</li> </ul> <p><b>Big test PPE (marked by teacher)</b> PPE Big Test 1</p>
<p><b><u>Unit test (marked by teacher)</u></b> Unit test F2</p> <p><b><u>Unit tests (Self-assessment)</u></b> Unit tests F1, F3, F4</p> <p><b><u>Feedforward and Intervention</u></b> Students to complete the questions where they made errors (in purple pen)</p>	<p><b><u>Unit test (marked by teacher)</u></b> Unit test F5</p> <p><b><u>Unit tests (Self-assessment)</u></b> Unit tests F6, F8</p> <p><b><u>Feedforward and Intervention</u></b> Students to complete the questions where they made errors (in purple pen)</p>	<p><b><u>Unit tests (Self-assessment)</u></b> Unit tests F8, F9</p> <p><b><u>Feedforward and Intervention</u></b> Students to complete the questions where they made errors (in purple pen)</p>
<p><b>ATL Data capture</b></p>	<p><b>PPE and ATL data</b></p>	<p><b>PPE data</b> <b>ATL Data capture</b></p>

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Spring 2 6 weeks	Summer 1 5 weeks	Summer 2 7 weeks
<p><b>Content</b> F11 Ratio 2 F12 Growth &amp; Decay</p>	<p><b>Content</b> F13 Pythagoras Review F14 Bearings and Scale Drawings</p>	<p><b>Content</b> EOY 10 Revision programme (Year 9 and Year 10 Review)</p>
<p><b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test:</p> <ul style="list-style-type: none"> <li>• Simplify ratios</li> <li>• Divide a quantity into a given ratio</li> <li>• Write ratios as fractions</li> <li>• Compare lengths, areas and volumes using ratio notation and scale factors</li> <li>• <b>Solve ratio problems involving the change of a ratio within a question</b></li> <li>• <b>Relate ratios to fractions and to linear functions</b></li> <li>• <b>Set up, solve and interpret the answers in growth and decay problems, including compound interest</b></li> <li>• <b>Identify the interest rate in compound interest questions</b></li> <li>• <b>Set up, solve and interpret the answers in growth and decay problems</b></li> </ul>	<p><b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test:</p> <ul style="list-style-type: none"> <li>• <b>Calculate with roots, and with integer indices</b></li> <li>• <b>Leave answers in surd form</b></li> <li>• <b>Given 3 sides of a triangle, justify if it is right-angled or not</b></li> <li>• <b>Apply Pythagoras' Theorem with a triangle drawn on a coordinate grid</b></li> <li>• <b>Calculate the length of a line segment AB given pairs of points</b></li> <li>• Interpret maps and scale drawings</li> <li>• Estimate lengths using a scale diagram</li> <li>• Make an accurate scale drawing from a diagram</li> <li>• Know and use compass directions</li> <li>• Use three-figure bearings to specify direction</li> <li>• Mark on a diagram the position of point B given its bearing from point A</li> <li>• Give a bearing between the points on a map or scaled plan</li> <li>• Given the bearing of a point A from point B, work out the bearing of B from A</li> <li>• Use accurate drawing to solve bearings problems</li> <li>• Solve locus problems including bearings</li> </ul>	<p><b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test:</p> <ul style="list-style-type: none"> <li>• EOY Revision programme- Revision of key topics</li> <li>• Preparation for UL tests and exam papers</li> </ul>
<p><b><u>Unit test (marked by teacher)</u></b> Unit test F11</p> <p><b><u>Unit tests (Self-assessment)</u></b> Unit tests F10*, F12</p>	<p><b><u>Unit test (marked by teacher)</u></b> Unit test F13</p> <p><b><u>Unit tests (Self-assessment)</u></b> Unit test F14</p>	<p><b><u>EOY PPE test (marked by teacher)</u></b> EOY PPE Paper 1 and Paper 2</p> <p><b><u>Unit tests (Self-assessment)</u></b></p>

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<b>Feedforward and Intervention</b> Students to complete the questions where they made errors (in purple pen)	<b>Feedforward and Intervention</b> Students to complete the questions where they made errors (in purple pen)	n/a
ATL data	ATL Data capture	<b>PPE data</b> <b>PPE and ATL data</b>

## Year 11 Foundation Mathematics

Autumn 1 8 weeks	Autumn 2 7 weeks	Spring 1 6 weeks
<b>Content</b> F15 Algebra Review F16 Right angled Trigonometry F17 Similar shapes	<b>Content</b> F18 Congruence F19 Constructions and Loci <b>Mock PPE exams- revision and preparation</b> <b>Feedforward lessons based on QLAs</b>	<b>Content</b> Revision programme for GCSE exams 2025
<b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test: <ul style="list-style-type: none"> <li>Solve linear equations in one unknown algebraically</li> <li>Rearrange formulae to change the subject in a geometrical context</li> <li>Substitute numerical values into formulae and expressions, including scientific formulae</li> <li>Simplify and manipulate algebraic expressions (including those involving surds) by: collecting like terms, multiplying a single term over a bracket, taking out common factors, expanding products of two binomials, factorising quadratic expressions of the form <math>x^2 + bx + c</math>, including the difference of two squares, simplifying expressions involving sums, products and powers, including the laws of indices</li> <li>Simplify expressions using index laws.</li> </ul>	<b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test: <ul style="list-style-type: none"> <li>Identify congruent shapes by eye</li> <li>Understand that distances and angles are preserved under reflections, so that any figure is congruent under this transformation</li> <li><b>Congruence criteria for triangles (SSS, SAS, ASA, RHS)</b></li> <li><b>Solve angle problems involving congruence</b></li> <li>Draw circles and arcs to a given radius or given the diameter</li> <li>Measure and draw lines, to the nearest mm</li> <li>Measure and draw angles, to the nearest degree</li> <li><b>Use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at</b></li> </ul>	<b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test: <ul style="list-style-type: none"> <li>Revision of key topics- bespoke plan for each Year 11 Maths class</li> <li>Preparation for GCSE exams- practice and exam papers</li> </ul>

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<ul style="list-style-type: none"> <li>Solve linear equations up to and including those with the unknown on both sides of the equation.</li> <li>Find approximate solutions using linear and quadratic graphs.</li> <li>Changing the subjects of formulae, including finding <math>r</math> or <math>d</math> when given a sector area or arc length.</li> <li>Substitute values into formulae. Construct and solve linear simultaneous equations using elimination and substitution.</li> <li>Calculate with roots, and with integer indices</li> <li>Trigonometry in right angled triangles</li> <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>Find angles of elevation and depression</li> <li>Understand that similar shapes are enlargements of each other and angles are preserved – define similar in this unit</li> <li>Identify shapes which are similar; including all circles or all regular polygons with equal number of sides</li> <li><b>Apply the concepts similarity, including the relationships between lengths in similar figures</b></li> <li>Understand similarity of triangles and of other plane shapes, use this to make geometric inferences, and solve angle problems using similarity</li> <li>Understand the effect of enlargement on perimeter of shapes</li> <li>Solve problems to find missing lengths in similar shapes</li> </ul> <p><b><u>Mini test (marked by teacher)</u></b> Unit test F16</p> <p><b><u>UNIT tests (Self-assessment)</u></b> Unit tests F15, F17</p>	<ul style="list-style-type: none"> <li>a given point, bisecting a given angle)</li> <li>Construct angles of <math>90^\circ, 45^\circ</math></li> <li>Use constructions 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: a region bounded by a circle and an intersecting line; a given distance from a point and a given distance from a line; equal distances from two points or two line segments; regions which may be defined by 'nearer to' or 'greater than'</li> </ul> <p><b><u>Mini test (marked by teacher)</u></b> PPE Papers 1, Paper 2 and Paper 3</p> <p><b><u>UNIT tests (Self-assessment)</u></b> Unit test F18, F19</p>	<p><b><u>Mini test (marked by teacher)</u></b> GCSE practice papers</p> <p><b><u>UNIT tests (Self-assessment)</u></b> GCSE practice papers</p>
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<b><u>Feedforward and Intervention</u></b> Students to complete the questions where they made errors (in purple pen)	<b><u>Feedforward and Intervention</u></b> Students to complete the questions where they made errors (in purple pen)	<b><u>Feedforward and Intervention</u></b> Students to complete the questions where they made errors (in purple pen)
<b>Progress test in class; fluency tests</b> ATL data and Progress test %	<b>PPE exams, fluency tests</b> PPE and ATL data	<b>Tests in class, fluency tests</b> ATL data
<b>Spring 2</b> 6 weeks	<b>Summer 1</b> 5 weeks	<b>Summer 2</b> 7 weeks
<b>Content</b> <ul style="list-style-type: none"> <li>Revision programme for GCSE exams 2025</li> </ul>	<b>Content</b> <ul style="list-style-type: none"> <li>Revision programme GCSE exams 2025</li> <li>GCSE exams</li> </ul>	<b>Content</b> <ul style="list-style-type: none"> <li>Revision programme for GCSE exams 2025</li> <li>GCSE exams</li> </ul>
<b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test: <ul style="list-style-type: none"> <li>Revision of key topics- bespoke plan for each Year 11 Maths class</li> <li>Preparation for GCSE exams- practice and exam papers</li> </ul>	<b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test: <ul style="list-style-type: none"> <li>Revision of key topics- bespoke plan for each Year 11 Maths class</li> <li>Preparation for GCSE exams- practice and exam papers</li> </ul>	<b>Assessment Objectives</b> This is the knowledge, application and skills assessed by the Big Test: <ul style="list-style-type: none"> <li>Revision of key topics- bespoke plan for each Year 11 Maths class</li> <li>Preparation for GCSE exams- practice and exam papers</li> </ul>
<b><u>Mini test (marked by teacher)</u></b> PPE Papers 1, Paper 2 and Paper 3 GCSE practice papers	<b><u>Mini test (marked by teacher)</u></b> GCSE practice papers	<b><u>Mini test (marked by teacher)</u></b> n/a
<b><u>UNIT tests (Self-assessment)</u></b> GCSE practice papers	<b><u>UNIT tests (Self-assessment)</u></b> GCSE practice papers	<b><u>UNIT tests (Self-assessment)</u></b> n/a
<b><u>Feedforward and Intervention</u></b> Students to complete the questions where they made errors (in purple pen)	<b><u>Feedforward and Intervention</u></b> Students to complete the questions where they made errors (in purple pen)	<b><u>Feedforward and Intervention</u></b> Students to complete the questions where they made errors (in purple pen)

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<b>PPE exams, fluency tests</b> <b>PPE and ATL data</b>	<b>GCSE exams 2025</b>	<b>GCSE exams 2025</b>
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