

KS4 Foundation Mathematics Big Picture

Year 10 Foundation Mathematics

Autumn 1 8 weeks	Autumn 2 7 weeks	Spring 1 6 weeks
Content F1 Solving equations and Rearranging formulae F2 Linear Graphs F3 Linear Simultaneous Equations F4 Volume 2	Content F5 Compound Measures F6 Quadratics - graphical F7 Quadratics - algebraic F8 Further graphs	Content F9 Probability 2 F10 Statistics 2
Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: - Solve linear equations in one unknown algebraically - Rearrange formulae to change the subject in a geometrical context - Change the subject of a formula involving the use of square roots and squares Solve linear equations with the unknown on both sides of the equation Calculate the radius or diameter when Sector area or Arc length is given - Plot and read coordinates in all four quadrants - Draw, label and scale axes - Plot straight line graphs - Recognise, sketch and interpret straight line graphs - Find approximate solutions using a graph - Find the coordinates of the midpoint of a line segment - Use real life graphs: ready reckoner graphs, conversion graphs, fuel bills graphs, fixed charge and cost per unit - Identify and interpret gradients and intercepts of straight-line graphs	Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: - Interpret distance–time graphs, and calculate: the speed of individual sections, total distance and total time - Change between standard units e.g. time, mass, length, money, volume, area - Change between compound units e.g. speed, rates of pay, prices - Work out time intervals for graph scales Change between standard units and compound units e.g. density and pressure - Recognise, sketch and interpret graphs of quadratic functions Identify roots, intercepts and turning points of a quadratic function Find approximate solutions using a graph Identify the line of symmetry of a quadratic graph Find roots of a quadratic algebraically by factorisation Recognise and sketch cubic graphs and the reciprocal graph Plot and interpret reciprocal graphs	Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: - Apply systematic listing strategies - Describe probability using the probability scale, tables and frequency trees - Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments - Calculate expected outcomes - Mutually exclusive events sum to one - Experimental and theoretical probability - Use Venn diagrams and appropriate notation - Probability space/sample space diagrams - Find a missing probability from a list or table including algebraic terms Unbiased samples and effects of increasing sample size Probability tree diagrams for independent and dependent events Calculate the probability of independent and dependent combined events Sets and combinations of sets using Venn diagrams

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- Identify and interpret gradient from an equation $y = mx + c$ Plot and draw graphs of straight lines in the form $ax + by = c$ Find the equation of a straight line from a graph Use $y = mx + c$ to identify parallel lines Find the equation of a line through two given points or -through one point with a given gradient Know that the gradient of a straight line is interpreted as a rate of change Identify and interpret the gradient from an equation $ax + by = c$ Solve two simultaneous equations in two variables (linear/linear) algebraically Find approximate solutions using a graph Derive two simultaneous equations, solve the equation and interpret the solution - Know and apply formulae to calculate volume of cuboids and other right prisms (including cylinders) Find the volume of spheres, pyramids, cones and composite solids <u>Unit test (marked by teacher)</u> Unit test F2 <u>Unit tests (Self-assessment)</u> Unit tests F1, F3, F4 <u>Feedforward and Intervention</u> Students to complete the questions where they made errors (in purple pen)	Recognise and interpret graphs that illustrate direct and inverse proportion <u>Unit test (marked by teacher)</u> Unit test F5 <u>Unit tests (Self-assessment)</u> Unit tests F6, F8 <u>Feedforward and Intervention</u> Students to complete the questions where they made errors (in purple pen)	- Draw and Interpret frequency tables, bar charts, composite bar charts, pie charts, pictograms, vertical line charts, stem and leaf (including back-to-back stem and leaf) - Mean, mode, median, modal class - Range and outliers - 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 - Recognise the advantages and disadvantages between measures of average - Scatter graphs - recognise correlation - Recognise types of data: primary secondary, quantitative and qualitative - Understand sample and population - Listing combinations Sampling - infer properties of populations or distributions from a sample, while knowing the limitations of sampling Interpret and construct tables and line graphs for time series data Scatter graphs - draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends while knowing the dangers of doing so <u>Big test PPE (marked by teacher)</u> PPE Big Test 1 <u>Unit tests (Self-assessment)</u> Unit tests F8, F9 <u>Feedforward and Intervention</u> Students to complete the questions where they made errors (in purple pen)
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ATL Data capture	PPE and ATL data	PPE data ATL Data capture
Spring 2 6 weeks	Summer 1 5 weeks	Summer 2 7 weeks
Content F11 Ratio 2 F12 Growth & Decay	Content F13 Pythagoras Review F14 Bearings and Scale Drawings	Content EOY 10 Revision programme (Year 9 and Year 10 Review)
Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: • Simplify ratios • Divide a quantity into a given ratio • Write ratios as fractions • Compare lengths, areas and volumes using ratio notation and scale factors • Solve ratio problems involving the change of a ratio within a question • Relate ratios to fractions and to linear functions • Set up, solve and interpret the answers in growth and decay problems, including compound interest • Identify the interest rate in compound interest questions • Set up, solve and interpret the answers in growth and decay problems	Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: • Calculate with roots, and with integer indices • Leave answers in surd form • Given 3 sides of a triangle, justify if it is right-angled or not • Apply Pythagoras' Theorem with a triangle drawn on a coordinate grid • Calculate the length of a line segment AB given pairs of points • Interpret maps and scale drawings • Estimate lengths using a scale diagram • Make an accurate scale drawing from a diagram • Know and use compass directions • Use three-figure bearings to specify direction • Mark on a diagram the position of point B given its bearing from point A • Give a bearing between the points on a map or scaled plan • Given the bearing of a point A from point B, work out the bearing of B from A • Use accurate drawing to solve bearings problems • Solve locus problems including bearings	Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: • EOY Revision programme- Revision of key topics • Preparation for UL tests and exam papers
Unit test (marked by teacher) Unit test F11	Unit test (marked by teacher)	EOY PPE test (marked by teacher)

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Unit tests (Self-assessment) Unit tests F10*, F12 Feedforward and Intervention Students to complete the questions where they made errors (in purple pen)	Unit test F13 Unit tests (Self-assessment) Unit test F14 Feedforward and Intervention Students to complete the questions where they made errors (in purple pen)	EOY PPE Paper 1 and Paper 2 Unit tests (Self-assessment) n/a Feedforward and Intervention Students to complete the questions where they made errors (in purple pen)
ATL data	ATL Data capture	PPE data PPE and ATL data

Year 11 Foundation Mathematics

Autumn 1 8 weeks	Autumn 2 7 weeks	Spring 1 6 weeks
Content F15 Algebra Review F16 Right angled Trigonometry F17 Similar shapes	Content F18 Congruence F19 Constructions and Loci Mock PPE exams- revision and preparation Feedforward lessons based on QLAs	Content Revision programme for GCSE exams 2025
Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: - Solve linear equations in one unknown algebraically - Rearrange formulae to change the subject in a geometrical context - Substitute numerical values into formulae and expressions, including scientific formulae - 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	Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: - Identify congruent shapes by eye - Understand that distances and angles are preserved under reflections, so that any figure is congruent under this transformation - Congruence criteria for triangles (SSS, SAS, ASA, RHS) - Solve angle problems involving congruence - Draw circles and arcs to a given radius or given the diameter	Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: - Revision of key topics- bespoke plan for each Year 11 Maths class - Preparation for GCSE exams- practice and exam papers

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two binomials, factorising quadratic expressions of the form $x^2 + bx + c$, including the difference of two squares, simplifying expressions involving sums, products and powers, including the laws of indices • Simplify expressions using index laws. • Solve linear equations up to and including those with the unknown on both sides of the equation. • Find approximate solutions using linear and quadratic graphs. • Changing the subjects of formulae, including finding r or d when given a sector area or arc length. • Substitute values into formulae. Construct and solve linear simultaneous equations using elimination and substitution. • Calculate with roots, and with integer indices • Trigonometry in right angled triangles • Know the exact values of $\sin\theta$ and $\cos\theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90°. Know the exact value of $\tan\theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ$ and 60° • Find angles of elevation and depression • Understand that similar shapes are enlargements of each other and angles are preserved- – define similar in this unit • Identify shapes which are similar; including all circles or all regular polygons with equal number of sides • Apply the concepts similarity, including the relationships between lengths in similar figures • Understand similarity of triangles and of other plane shapes, use this to make geometric inferences, and solve angle problems using similarity • Understand the effect of enlargement on perimeter of shapes • Solve problems to find missing lengths in similar shapes	• Measure and draw lines, to the nearest mm • Measure and draw angles, to the nearest degree • 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) • Construct angles of $90^\circ, 45^\circ$ • 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 • 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'	
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<u>Mini test (marked by teacher)</u> Unit test F16 <u>UNIT tests (Self-assessment)</u> Unit tests F15, F17 <u>Feedforward and Intervention</u> Students to complete the questions where they made errors (in purple pen)	<u>Mini test (marked by teacher)</u> PPE Papers 1, Paper 2 and Paper 3 <u>UNIT tests (Self-assessment)</u> Unit test F18, F19 <u>Feedforward and Intervention</u> Students to complete the questions where they made errors (in purple pen)	<u>Mini test (marked by teacher)</u> GCSE practice papers <u>UNIT tests (Self-assessment)</u> GCSE practice papers <u>Feedforward and Intervention</u> Students to complete the questions where they made errors (in purple pen)
Progress test in class; fluency tests ATL data and Progress test %	PPE exams, fluency tests PPE and ATL data	Tests in class, fluency tests ATL data
Spring 2 6 weeks	Summer 1 5 weeks	Summer 2 7 weeks
Content Revision programme for GCSE exams 2025	Content - Revision programme GCSE exams 2025 - GCSE exams	Content - Revision programme for GCSE exams 2025 - GCSE exams
Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: - Revision of key topics- bespoke plan for each Year 11 Maths class - Preparation for GCSE exams- practice and exam papers <u>Mini test (marked by teacher)</u> PPE Papers 1, Paper 2 and Paper 3 GCSE practice papers <u>UNIT tests (Self-assessment)</u> GCSE practice papers	Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: - Revision of key topics- bespoke plan for each Year 11 Maths class - Preparation for GCSE exams- practice and exam papers <u>Mini test (marked by teacher)</u> GCSE practice papers <u>UNIT tests (Self-assessment)</u> GCSE practice papers <u>Feedforward and Intervention</u>	Assessment Objectives This is the knowledge, application and skills assessed by the Big Test: - Revision of key topics- bespoke plan for each Year 11 Maths class - Preparation for GCSE exams- practice and exam papers <u>Mini test (marked by teacher)</u> n/a <u>UNIT tests (Self-assessment)</u> n/a <u>Feedforward and Intervention</u> Students to complete the questions where they made errors

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<u>Feedforward and Intervention</u> Students to complete the questions where they made errors (in purple pen)	Students to complete the questions where they made errors (in purple pen)	(in purple pen)
PPE exams, fluency tests PPE and ATL data	GCSE exams 2025	GCSE exams 2025