The Acorns School

Overview plans for academic year 2024-2025

Subject: Maths **Year group/cohort:** Year 11 Foundation and Higher **(In Bold)**

	Knowledge, Understanding and Skills	**Knowledge and Understanding**	**Assessment**	**Subject specific literacy**	**Cross curricular links**	**Prior Knowledge**
	Composite (Bigger picture)	Components (Key concepts)	What is being assessed, how, and when?	Key Vocabulary	Including Personal Development and SMSC	KS3 Objectives – NC link - Mathematics programmes of study: key stage 3
Autumn Term 1 (8 weeks) **Week 1-3**	Indices and Standard Form WRM links – - Y10 Su4 Indices & Roots	- Recall and use square and cube numbers - Calculate higher powers and roots. - Know and use laws of indices. - Convert between ordinary numbers and standard form. - Calculate with standard form. - **Understand and use fractional indices.**	Formative assessment throughout AQA topic test	Standard index form Indices Base Root Power	Chemistry Engineering Measuring very small/big objects Cross-curricular – Science	- Use the laws of indices. - Calculate with powers of ten. - Add, subtract, multiply and divide with standard form. - Use a calculator to answer complex calculations. - Distinguish between exact representation of roots and their decimal approximations.
Week 4-5	Multiplicative Reasoning WRM links – - Y11 Spr1 Multiplicative Reasoning	- Solve ratio problems. **- Solve ratio in area problems.** - **Solve ratio in volume problems**. - Understand and solve problems involving direct and inverse proportion.	Formative assessment throughout AQA topic test	Ratio Area Volume Direct proportion	Recipes Maps and scale drawings Discount and sales	- Simplify ratio. - Share into a ratio. - Find equivalent ratios. - Calculate missing parts of a ratio when the difference is given. - Understand direct proportion.

		- Recognise and interpret graphs that show direct and inverse proportion. - **Construct complex direct and inverse proportion equations**.		Inverse proportion Per Y=kx	Currency conversion Cross-curricular – Science, Cookery	- Use the unitary method. - Solve best buy problems/ scale up recipes/ convert currencies etc. - Solve word problems involving direct and inverse proportion. - Recognise when values are in direct proportion by reference to the graph form. Use and understand the direct proportion relationship y =kx.
Week 6-7	Angles and Circles WRM links – - Y11 Spr2 Geometric Reasoning	- Angle rules – at a point, straight line, parallel lines etc. - Exterior and interior angles of polygons. - Solve problems with vectors. **- Know and understand circle theorems.** **- Solve angle problems using circle theorems.** **- Prove circle theorems.** **- Find the equation of a tangent.**	Formative assessment throughout AQA topic test	Angle Property Side Vertices (Corners) Angle Interior Exterior Polygon Parallel Perpendicular **Tangent** **Chord** **Cyclic** **Alternate**	Construction Architecture Navigation Art and Design Cross-curricular – Science, PE, Art, English	- Calculate interior and exterior angles of regular and irregular polygons. - Recall and use properties of angles at a point, on a straight line, right angles and vertically opposite angles. - Find angles in parallel lines. - Recognise and label parts of a circle. - Find the circumference and area of circles.
Week 8	Assessment	GCSE Mock				
Autumn Term 2 (7 weeks) **Week 1-3**	Equations and Graphs WRM links – - Y11 Au2 Non-linear Graphs	- Plot and read from straight line graphs. - Expand and factorise single and double brackets. - Plot and read from quadratic graphs.	Formative assessment throughout AQA topic test	Plot Sketch Y=mx+c Equations Expand Factorise Quadratic	Cost and quantity Profit and loss Optimising routes Projectile motion	- Use positive and negative coordinates. - Draw straight line graphs. - Recognise common straight line graphs. - Find equation of linear graphs.

	- Y11 Au4 Expanding & Factorising - Y10 Au4 Simultaneous Equations	- Solve quadratics by graph, factorising and algebraically. - Solve simultaneous equations graphically and algebraically. - Plot and read from cubic graphs. - Plot and read from reciprocal graphs. - Recognise graph shapes. - **Understand and use exponential graphs.** **- Find and use the equation of a circle centre 0.** **- Find the equation of the tangent to any curve.**		Simultaneous equations Cubic Reciprocal **Exponential** **Tangent**	Cross-curricular – Science, PE	- Identify parallel and perpendicular graphs. - Draw and interpret quadratic graphs. - Interpret graphs including reciprocal and piece-wise. - Represent inequalities.
Week 4-6	Transforming and Constructing WRM links – - Y11 Spr4 Transforming & Constructing	- Transform shapes – symmetry, rotation, translation, enlargement. - Perform and describe a series of transformations. - **Identify invariant points and lines.** - Draw plans and elevations. - Perform constructions using ruler, protractor and compass. - Solve loci problems. **- Understand trigonometrical graphs.** **- Sketch and identify translations of the graph of a given function.** **- Sketch and identify reflections of the graph of a given function.**	Formative assessment throughout AQA topic test	Symmetry Rotation Translation Enlargement Invariant Plans Elevations Construct Loci **Trigonometric** Intercept	Moving objects Floor cleaning Design Architecture 3D modelling Video games Cross-curricular – Art	-Understand rotational symmetry for 2d shapes. - Describe and transform rotations. - Describe and transform reflections. - Describe and transform translations, including the use of vectors. - Describe and transform enlargements, using a positive integer or fractional scale factor, including from a given point. - Understand the scale factor of an enlargement of a shape as the ratio of the lengths of two corresponding sides. - Understand the effect of enlargement on perimeter of shapes. - Identify similar and congruent triangles.

						- Solve angle problems involving congruence.
Week 7	Assessment	GCSE Mock				
Spring Term 1 (6 weeks) **Week 1-2**	Further algebra WRM links – - Y11 Au5 Changing the Subject	- Solve linear equations. - Solve inequalities. - Solve linear equations and inequalities in the context of shape. - Change the subject of a formula. **- Change the subject where it appears more than once.** **- Solve equations by iteration.** **- Graphical representations of inequalities.**	Formative assessment throughout AQA topic test	Linear Equation Inequality Formula Subject **Iteration**	Taxi fares Utility bills Budgeting Comparing rates Cross-curricular – Science, PD	- Set up simple equations. - Solve simple equations. - Solve linear equations in which the unknown appears on both sides. - Solve linear equations which contain brackets. - Rearrange simple equations. - Substitute into a formula and solve the resulting equation. - Solving one and two step equations including angle and perimeter problems using algebra.
Week 3-4	Functions WRM links – - Y11 Au6 Functions	- Use function machines - Use function notation. **- Work with composite functions.** **- Work with inverse functions.** - Understand trigonometric functions.	Formative assessment throughout AQA topic test	Function Function notation f(x) **Composite** **Inverse** Trigonometric	Taxes GPS Computer Science Cross-curricular – Science, computing	- Select an expression/equation/identity/formula from a list. - Write expressions. - Simplify expressions by collecting like terms. - Multiply two simple algebraic expressions. - Simplify expressions by cancelling. - Substitute positive and negative numbers into expressions and formulae. - Use function machines.
Week 5	Sequences WRM links –	- Simplify complex expressions. - Find the nth term rule for a sequence. - **Find the nth term rule for a quadratic sequence.**	Formative assessment throughout	Expression Nth term Sequence **Quadratic** **Proof**	Delivery routes Time-based projects	- Work out terms of an arithmetic sequence. - Find the nth term. -Recognise geometric sequences.

	- Y11 Spr3 Algebraic Reasoning	- **Use rules for sequences.** - **Algebraic proof**. - **Inequalities in two variables**.	AQA topic test	**Inequalities** **Variables**	Cross-curricular – Science	
Week 6	Assessment	GCSE Mock				
Spring Term 2 (5 weeks) **Week 1-2**	Compound Measures WRM links – - Y11 Au3 Using Graphs	- Solve problems involving mass, length, time and money. - Solve problems involving compound measures; density, pressure, speed. - Construct and interpret distance/time graphs. - Construct and interpret piece-wise graphs. - **Estimate the area under a curve.**	Formative assessment throughout AQA topic test	Length Time Money Density Mass Volume Pressure Force Area Speed Distance Time **Curve**	Fuel consumption Rates of Pay Plumbing Sprinting Cross-curricular – Science, PE	- Solve speed, distance and time problems. - Use distance-time graphs. - Solve problems with density, mass and volume. - Solve flow problems and their graphs. - Convert between metric units of the above.
Week 3-5	Statistics WRM links – - Y11 Spr5 Listing & Describing	- Work with organised lists and apply systematic listing strategies. - **Use the product rule for counting.** - Sample space and probability. - Venn diagrams and probability. - Compare distributions using data. -Interpret scatter graphs.	Formative assessment throughout AQA topic test	Systematic listing **Product rule** Sample space Probability Venn diagram Distributions Scatter graph Correlation	Choosing outfits Selecting a meal Creating passwords Planning trips Cross-curricular – Science, cookery, PD	- Calculate probability. - List all outcomes for single events systematically. - Use tools like frequency trees, two-way tables and Venn diagrams to sort data including union and intersection notation. - Add simple probabilities. - Identify different mutually exclusive outcomes and know that the sum of the probabilities of all outcomes is 1. - Find a missing probability from a list/table including algebraic terms.
Summer Term 1	WRM links – - Y11 Spr6 Show that…	-Gap analysis -Personalised revision -Exam Techniques				

(6 weeks)		- Prior learning revisited to strengthen long-term retention
Summer Term 2 (7 weeks)	WRM links – - Y11 Spr6 Show that…	-Gap analysis -Personalised revision -Exam Techniques - Prior learning revisited to strengthen long-term retention

Subject Information including exam board details:

The key stage 4 curriculum is following the scheme of work for AQA. White Rose Maths and Mathsbox is available to support pupils and non-specialist teachers delivering the curriculum. Teachers' individual knowledge and resources are also utilised. Pupils will be tested at the end of each term to monitor progress. If pupils are identified for under achievement, intervention will be applied to support. Our curriculum is designed to develop fluency in the fundamentals of mathematics, build reasoning skills by following lines of enquiry, making generalisations and justifying conclusions, and encourage application of problem solving in varied, rich and increasingly complex situations.

Careers linked to this subject area:

Education, Engineering, Finance, Banking, Accountancy, Engineering, Economist, Data analysis, Electrical engineer, Meteorologist, Software Developer, Stockbroker, Actuary, Economist, Computer programmer, Architect, Air Traffic Control, Engineer, Researcher

Enrichment Opportunities:

Mathematics teaching staff will look for opportunities to enhance student learning using games, online resources, real-life projects, competitions and maths-specific events/trips or days.