The Acorns School

Overview plans for academic year 2024-2025

Subject: Maths **Year group/cohort:** Year 10 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 1-4**	Non-Calculator Methods WRM links – - Y10 Su2 Non-calculator methods - Y10 Su4 Manipulating Expressions	- Complete mental and written methods of addition and subtraction of integers and decimals. - Complete mental and written methods of multiplication and division of integers and decimals. - Add, subtract, multiply and divide with fractions, including mixed numbers. - **Convert between recurring decimals and fractions.** **- Add, subtract, multiply and divide with algebraic fractions.**	Formative assessment throughout AQA topic test	Add Subtract Multiply Divide *(inc variations of these)* Integer Decimal Recurring Terminating Fraction Mixed Number	Used through everyday life Money Cooking Budgeting Planning a trip Cross-curricular – PD, Science, Cookery	- Understand place value. - Use four operations on integers including negative numbers. - Use BIDMAS. - Convert between mixed numbers and improper fractions. - Add and subtract fractions. - Multiply and divide fractions. - Round to the nearest integer. - Round both positive and negative numbers to a given number of decimal places. - Round numbers to 10, 100 and 1000 etc. - Round numbers to significant figures.

		-Understand and find the reciprocal of an integer, decimal or fraction. **- Understanding rational and irrational numbers.** **- Understand and use surds.** **- Calculate with surds.** - Rounding to decimal places and significant figures. - Estimating answers to calculations. - Understand and use limits of accuracy. - **Upper and lower bounds**.		**Rational** **Irrational** **Surd** Significant figures Rounding Limits **Bounds**		- Estimate answers to calculations by rounding to 1 significant figure. - Calculate possible resulting errors using inequality notation $a<x\leq b$.
Week 5-7	Percentages and Interest WRM links – - Y10 Sp5 Percentages & Interest	- Convert between fractions, decimals and percentages. - Workout percentage of an amount. - Calculate percentage increase/decrease. - Work with real life percentages including VAT and simple interest. - Calculate compound interest and decay. - **Calculate repeated percentage change.** **- Understand iterative process.**	Formative assessment throughout AQA topic test	Increase Decrease VAT Simple interest Compound interest Decay Depreciation Percentage multiplier **Iteration** **Iterative formula**	Discounts Interest Rates VAT Taxes Weather forecasting Online polls and surveys Cross-curricular – Science, Cookery	- Understand basic fraction, decimals and percentages conversions. - Find percentages of shapes. - Find a percentage of an amount. - Compare two quantities using percentages. - Work with percentages greater than 100%. - Express a change as a percentage.
Week 8	Assessment	Summative assessment based on non-calculator methods and percentages and interest.				
Autumn Term 2 (7 weeks)	Angles and Bearings WRM links –	- Draw and interpret scale diagrams. - Understand and represent bearings.	Formative assessment throughout	Scale Bearing Pythagoras Trigonometry	Navigation Maps Compasses GPS systems	- Recall and use properties of angles at a point, on a straight line, right angles and vertically opposite angles. - Find angles in parallel lines.

Week 1-2	- Y10 Sp1 Angles & Bearings	- Measure and read bearings. - Make scale drawings using bearings. - Calculate bearings using angle rules. - Solve bearing problems using Pythagoras and Trigonometry. - **Solve bearing problems using the sine and cosine rules.**	AQA topic test	**Sine rule** **Cosine rule**	Boating Aviation Hiking Architecture Cross-curricular – Science, History	- Use scales in maps and plans including ratios. - Measure and use bearings.
Week 3-4	Congruence, Similarity and Enlargement WRM links – - Y10 Au1 Congruence, Similarity & Enlargement	- Enlarge a shape by a positive scale factor. - Enlarge a shape by a fractional scale factor. - **Enlarge a shape by a negative scale factor.** - Identify similar shapes. - Work out missing sides and angles in similar shapes. - Use parallel lines to work out missing angles. - **Explore areas of similar shapes.** **- Explore volumes of similar shapes.** - Understand and use congruent triangles. - **Prove a pair of triangles are congruent.**	Formative assessment throughout AQA topic test	Enlarge Scale factor Positive Fractional **Negative** Similar Parallel Area Volume Congruent	Construction Manufacturing Architecture Scale Models Engineering Design Photography Printing Cross-curricular – Art, Science	- 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. - Solve problems to find missing lengths in similar shapes.
Week 5-6	Sequences WRM links – - Y10 Su3 Types of	- Understand and express a number as a product of its prime factors. - Find the HCF and LCM of a set of numbers.	Formative assessment throughout	Prime Factor HCF LCM Sequence	Simple interest Seating arrangements Fencing	-Find common factors and common multiples of two numbers. - Find the highest common factor and lowest common multiple of two

	Number & Sequences	- Continue linear and geometric sequences. - Continue special sequences such as Fibonacci. - Find the rule for the nth term of a linear sequence. - **Describe and continue sequences involving surds.** **- Find the rule for the nth term of a quadratic sequence.**	AQA topic test	Nth term Fibonacci **Quadratic sequence**	Compound interest Bacterial growth Depreciation Population Growth Cross-curricular – PD, Science	numbers including solving simple problems. - Work out terms of an arithmetic sequence. - Find the nth term. -Recognise geometric sequences.
Week 7	Assessment	Summative assessment based on angles and bearings, congruence, similarity and enlargement and sequences.				
Spring Term 1 (6 weeks) **Week 1-2**	Ratio and Fractions WRM links – - Y7 Sp4 Ratios & Fractions	- Compare quantities using a ratio. - Share in a ratio. - Understand ratios in the form 1:n. - Use ratios and fractions to make comparisons. - Link ratios and graphs. - Solve problems with currency conversion. - Solve best buy problems. - Combine a set of ratios. **- Ratio in area problems** **- Ratio in volume problems.**	Formative assessment throughout AQA topic test	Ratio Proportion Equivalent Simplify	Cooking Scaling Mixing Sharing Finance Sports and games Photography and film Cross-curricular – Art, Cookery, Science	- Understand ratio notation. - Simplify ratio. - Share into a ratio. - Find equivalent ratios. - Calculate missing parts of a ratio when the difference is given. - Solve double ratio problems. - Write a ratio as a linear function.
Week 3-5	Equations and Inequalities WRM links – - Y10 Au3 Representing Solutions of	- Solve linear equations including brackets and unknown on both sides. - Write numbers which satisfy an inequality and represent on number line. - Solve one-step and two-step inequalities.	Formative assessment throughout AQA topic test	Equation BIDMAS Brackets Inequality **Set notation** **Completing the square**	Budgeting Cooking Baking Speed limits Shopping Age restrictions	- Set up simple equations. - Solve simple equations. - Solve linear equations in which the unknown appears on both sides. - Solve linear equations which contain brackets.

	Equations & Inequalities - Y10 Au4 Simultaneous Equations	- **Represent solutions to inequalities using set notation.** - **Solve quadratic equations using factorising, formula and completing the square.** **- Solve quadratic inequalities using one variable.** - Solve linear simultaneous equations. - **Solve simultaneous equations with one linear and one quadratic**.		**Quadratic inequalities** **Variables** Simultaneous	Cross-curricular – Science, Cookery	
Week 6	Assessment	Summative assessment based on ratio and fractions and equations and inequalities.				
Spring Term 2 (5 weeks) **Week 1-4**	Data WRM links – - Y10 Su1 Collecting, Representing & Interpreting Data	- Understand population and samples. - Construct a stratified sample. - Construct and interpret frequency tables and frequency polygons. - Find averages from a list and table. - Construct and interpret two-way tables. - Construct and interpret line graphs. - Construct and interpret bar charts (including composite bar charts). - Construct and interpret pie charts. - **Construct and interpret histograms and cumulative frequency graphs.**	Formative assessment throughout AQA topic test	Sample Population Strata Frequency table Frequency polygon Line graph Bar chart Composite bar chart Pie chart **Histogram** **Cumulative frequency** **Box plot** Scatter graph Correlation	Tracking personal finance Monitoring health Stock market performance Weather patterns Website traffic Product sales analysis Analysing surveys Cross-curricular – PD, Science, PE	- Read, construct and interpret bar charts, pictograms, frequency tables and diagrams and line graphs. - Find averages and the range. - Understand misleading graphs. -Draw and interpret pie charts and compare. - Draw an interpret stem and leaf diagrams including identifying the median, mode and range. - Construct and interpret two-way tables. - Use tables and compare data.

		- **Construct and interpret box plots.** - Construct and interpret scatter graphs including line of best fit and correlation.				
Week 5	Assessment	Summative assessment based on data.				
Summer Term 1 (6 weeks) **Week 1**	Manipulating Expressions WRM links – - Y10 Su5 Manipulating Expressions	- Simplify expressions. - Use identities. **- Add and subtract algebraic fractions.** **- Multiply and divide algebraic fractions.** - Form and solve equations and inequalities with fractions.	Formative assessment throughout AQA topic test	Expression Identity Equation Inequality	Calculating Costs Budgeting Computer algorithms Cross-curricular – Computing, Science	- 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. - Use function machines. - Substitute positive and negative numbers into expressions and formulae.
Week 2-3	Straight Line Graphs WRM links – - Y11 Au1 Gradients & Lines	- Plot and sketch straight line graphs. - Find the equation of graphs using y=mx+c. - Draw and interpret real life graphs. - Find equations of lines parallel to the axis. - **Find equations of perpendicular lines.**	Formative assessment throughout AQA topic test	Plot Sketch Y=mx+c Equations Parallel **Perpendicular**	Stock market Sales data Cost analysis Temperature conversion Drug dosage Cross-curricular – Science	- Draw straight line graphs. - Recognise common straight line graphs. - Find equation of linear graphs. - Identify parallel and perpendicular graphs.
Week 4-5	Right-Angled Triangles WRM links –	- Understand hypotenuse, opposite and adjacent sides.	Formative assessment throughout	Hypotenuse Adjacent Opposite	Roof design Engineering Calculating distances in	- Use Pythagoras to find missing lengths. - Given 3 sides of a triangle, justify if it is right-angled or not.

	- Y9 Spr6 Pythagoras Theorem - Y10 Au2 Trigonometry	- Understand and solve problems with Pythagoras Theorem. - Use trigonometric ratios to find missing lengths. - Use trigonometric ratios to find missing angles. - **Use trigonometry in 3d shapes**. - **Use the formula 1/2absinC to find the area of non-right angle triangles.** **- Understand, choose and use the sine and cosine rules.**	AQA topic test	Pythagoras Theorem Trigonometry Sine Cosine Tangent Formula **1/2absinC**	games / simulations DIY projects Surveying Criminology Cross-curricular – Science	- Apply Pythagoras Theorem with a triangle drawn on a coordinate grid. -Calculate the length of a line segment AB given pairs of points. - Use trigonometric ratios to solve missing angles and sides.
Week 6	Assessment	Summative assessment based on manipulating expressions, straight line graphs and right-angled triangles.				
Summer Term 2 (7 weeks) **Week 1-2**	Vectors WRM links – - Y10 Spr3 Vectors	- Understand and represent vectors including vector notation. - Draw and understand addition and subtraction of vectors. - **Explore vector journeys in shape.** **- Explore quadrilaterals using vectors.** **- Prove lines are parallel or colinear.** **- Solve geometric problems using vector methods.**	Formative assessment throughout AQA topic test	Vector Vector Journey **Parallel** **Colinear**	GPS Piloting aircraft Guiding boats Controlling movement in games Analysing forces Cross-curricular – Science, PE	- Describe and transform translations, including the use of vectors.
Week 3-4	Probability WRM links – - Y10 Spr6 Probability	- Find probabilities and understand these sum to 1. - Work out experimental probabilities.	Formative assessment throughout	Probability Impossible, unlikely, even chance, likely, certain	Weather forecasting Health and safety Game playing Sports analyst	- Calculate probability. - List all outcomes for single events systematically. - Use tools like frequency trees, two-way tables and Venn diagrams to sort

		- Calculate probabilities from frequency and two way tables. - Calculate probabilities from Venn diagrams including set notation. - Calculate probabilities of independent events (including tree diagrams) - Use tree diagrams to calculate probabilities of dependent events. - **Construct and interpret conditional probabilities (involving tree diagrams, Venn diagrams and two-way tables.**	AQA topic test	Frequency Two-way table Venn diagram Set notation Independent Dependent Tree diagrams **Conditional**	Cross-curricular – PD, Science, PE	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.
Week 5-6	Area and Volume WRM links – - Y10 Spr2 Working with Circles	- Calculate arc length. - Calculate area and perimeter of sectors. - **Circle theorems – Angles at the centre and circumference, Angles in a semi-circle, Angles in the same segment, Angles in a cyclic quadrilateral.** - Calculate the surface area and volume of cylinders and other prisms. - Calculate the surface area and volume of cones and spheres. **- Calculate areas and volumes of similar shapes.**	Formative assessment throughout AQA topic test	Arc Sector Centre Radius Diameter Circumference **Chord** **Tangent** **Cyclic** **Alternate** Surface area Volume	Structural design Satellite orbits Penalty arc in football Cross-curricular – PE, Science	- Recognise and label parts of a circle. - Find the circumference and area of circles. - Find surface area and volume of 3d shapes.
Week 7	Assessment	Summative assessment based on vectors, probability and area and volume.				

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.