The Acorns School

Overview plans for academic year 2024-2025 YEAR 2

Subject: Maths **Year group/cohort: KS3**

	Knowledge, Understanding and Skills	Knowledge, Understanding and Skills	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	KS2 Objectives - NC link - KS2 Maths National Curriculum
Autumn Term 1 (8 weeks) **Week 1-4**	Number Skills WRM links – - Y7 Au4 Place Value & Ordering Integers & Decimals - Y7 Su5 Prime Numbers & Proof - Y8 Sp6 Number Sense	- Understand place value. - Use four operations on integers including negative numbers. - Use BIDMAS. - Use inequality symbols to compare two integers. -Identify factors, multiples and primes. - List all factors of a number and list multiples systematically. -Find common factors and common multiples of two numbers. - Find the highest common factor and lowest common multiple of two numbers	Formative assessment throughout	Place value – hundreds – tens - ones *(not units)* Add Subtract Multiply Divide *(inc variations of these)* BIDMAS Inequality Greater than Less than Equal to Factor Multiple Prime HCF	Understanding of different cultures approach to place value e.g. Chinese multiplication method Dividing items in to equal groups Cutting material	- Read, write order and compare numbers to at least 1 million. -Identify all factor pairs of a number. -Recognise and use square and cube numbers. - Add and subtract whole numbers with more than 4 digits. - Multiply numbers up to 4 digits by 1 or 2 digits. - Divide numbers up to 4 digits by 1 or 2 digits. - Use negative numbers in context.

		including solving simple problems. - Recall integer squares up to 12 x 12 and the corresponding square roots. - Recall the cubes of 1, 2, 3, 4, 5 and 10.		LCM Integer Square Cube	Scheduling recurring events Cross-curricular – PD, Science	
Week 5-6	Averages WRM links – - Y7 Au4 Place Value & Ordering Integers & Decimals - Y8 Su5 Measures of Location	- Find the mean, median, mode and range of a discrete set of data including frequency tables. - Compare averages and recognise advantages and disadvantages of each. - Calculate the range, modal class, interval containing the median, and estimate of the mean from grouped tables of data.	Formative assessment throughout	Mean Median Mode Range Discrete Continuous Advantage Disadvantage Modal class Interval Estimate	Sales analysis Performance management Training and fitness Healthcare drug dosages. Cross-curricular – Science, History, PE.	- Calculate and interpret the mean as an average.
Week 7	Graphs, Tables and Charts WRM links – - Y8 Au5 Representing Data	- Present data. - Interpret data and identify trends. - Plot and interpret scatter graphs. - Distinguish between positive, negative and no correlation. - Draw the line of best fit and use it to make predictions.	Formative assessment throughout	Trends Scatter graphs Correlation Line of best fit Prediction	Identifying trends in businesses e.g. sales vs. weather. Performance analysis in fitness.	- Solve comparison, sum and difference problems using information presented in a line graph - Complete, read and interpret information in tables, including timetables

					Identifying causes. Cross-curricular links – Science, PE, PD	
Week 8	Assessment	Summative assessment based on number skills, averages and graphs, tables and charts.				
Autumn Term 2 (7 weeks) **Week 1-2**	Shapes and Angles WRM links – - Y7 Su1 Constructing, Measuring & Using Geometric Notation -Y7 Su2 Developing Geometric Reasoning -Y8 Su1 Angles in Parallel Line & Polygons - Y9 Spr4 Deduction	- Classify quadrilaterals by properties. - 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.	Formative assessment throughout	Property Side Vertices (Corners) Angle Interior Exterior Polygon Parallel Perpendicular	Architecture and construction Navigation Surveying Cross-curricular links – Science, DT, History.	- Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. - Draw given angles, and measure them in degrees (°) • identify: -angles at a point and 1 whole turn (total 360°) -angles at a point on a straight line and half a turn (total 180°) -other multiples of 90° -Use the properties of rectangles to deduce related facts and find missing lengths and angles.
Week 3-4	Calculating with Decimals WRM links –	- Use decimal notation and place value. - Compare decimals using inequality symbols.	Formative assessment throughout	Decimal Place value – hundreds – tens - ones *(not units)*	Financial literacy Interest	-Add/subtract/multiply/ divide with whole numbers with more than 4 digits.

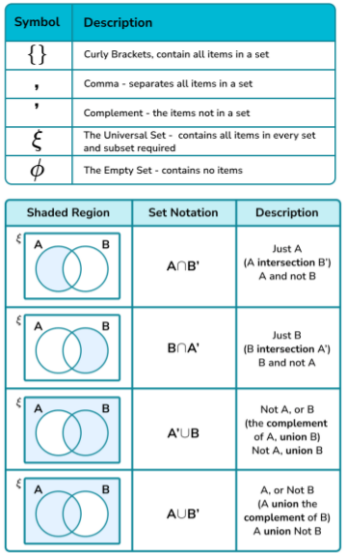
	- Y7 Au4 Place Value & Ordering Integers & Decimals - Y7 Sp1 Solving Problems with Addition & Subtraction - Y7 Sp2 Solving Problems with Multiplication & Division	- Add and subtract with decimals including calculations involving money. - Multiply and divide numbers by 10, 100, 1000 etc. - Multiply and divide with decimals including calculations involving money. - Round to the nearest integer. - Round both positive and negative numbers to a given number of decimal places.		Inequality – greater than – less than – equal to Integer Round Decimal places	Cooking Cross-curricular links – PD, Cookery, Science, PE.	- Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000. - Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000. -Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place -Read, write, order and compare numbers with up to 3 decimal places.
Week 5-6	Perimeter, Area and Volume WRM links – - Y8 Su2 Area of Trapezia & Circles - Y9 Au4 Three Dimensional Shape	- Convert between metric units. - Find perimeter and area of basic 2d shapes; rectangle, triangle, trapezium, parallelogram. - Find perimeter and area of compound 2d shapes. - Convert between metric area measures. - Identify the properties and name 3d shapes. - Calculate volume and surface area of 3d shapes. - Convert between metric volume measures.	Formative assessment throughout	Perimeter Area Shape names – rectangle, triangle, trapezium, parallelogram Compound 3d shape names – cylinder, cone, cube, sphere, cuboid, prism, pyramid Faces Edges Vertices	Construction and landscaping Surveying Interior Design Manufacturing and packaging Cross-curricular links - Science	- Identify 3-D shapes, including cubes and other cuboids, from 2-D representation. - Draw 2-D shapes using given dimensions and angles. -Recognise, describe and build simple 3-D shapes, including making nets.

				Volume Surface Area		
Week 7	Assessment	Summative assessment based on shapes and angles, calculating with decimals and perimeter area and volume.				
Spring Term 1 (6 weeks) **Week 1**	Time and Timetables WRM links – - Y7 Sp1 Addition & Subtraction	- Read the time from a digital and analogue clock. - Use correct notation for time. - Work out time taken for a journey from a timetable. - Solve problems involving time.	Formative assessment throughout	Time Analogue Digital 24 hour 12 hour	Travelling by bus/train/ plane Project planning Meeting deadlines Cross-curricular links – History, Science	- Tell and write the time from an **analogue clock**, including using **Roman numerals** from I to XII, and **12-hour and 24-hour clocks**. - Estimate and read time with increasing accuracy to the nearest **minute**; record and compare time in terms of **seconds, minutes, and hours**; use vocabulary such as **o'clock, a.m./p.m., morning, afternoon, noon and midnight**. - Know the number of **seconds in a minute** and the number of **days in each month, year and leap year**. -Compare durations of events.
Week 2-3	Algebra WRM links – - Y8 Sp1 Brackets, Equations & Inequalities	**(Check Y1 coverage is understood)** - Simplify expressions. - Expand and simplify single brackets. - Factorise expressions.	Formative assessment throughout	Simplify Expression Expand Rearrange Formula Substitute Powers	Heating, ventilation and air conditioning technicians.	**Y1 Coverage –** **- Select an expression/equation/identity/formula from a list.** **- Write expressions.** **- Multiply two simple algebraic expressions.**

		- Expand and simplify double brackets (and more). - Rearrange formulae. - Substitute numbers into expressions involving brackets and powers.			Finance and economics. Cross-curricular links – Science, cookery	**- Simplify expressions by cancelling.** **- Use function machines.** **- Substitute positive and negative numbers into expressions and formulae.** -Use simple formulae. -Generate and describe linear number sequences. -Express missing number problems algebraically.
Week 4-5	Fractions WRM links – - Y7 Sp5 Addition & Subtraction of Fractions - Y7 Sp3 Fractions & Percentages of Amounts - Y8 Au3 Multiplying & Dividing Fractions	**(Check Y1 coverage is understood)** - Express a given number as a fraction of another. - Order and compare fractions. - Convert between mixed numbers and improper fractions. - Add and subtract fractions (including negatives). - Multiply and divide an integer by a fraction. - Multiply and divide a fraction by an integer.	Formative assessment throughout	Fraction Ascending Descending Mixed number Improper fraction Integer Add Subtract Multiply Divide *(inc variations of these)*	Healthcare – medication dosage Construction – plumbers, carpenters, electricians use fractions of pipes/wood etc. Cooking Sports Cross-curricul	**Y1 Coverage –** **- Identify equivalent fractions and identify simplest form.** **- Add and subtract fractions.** **- Multiply and divide fractions.** **- Understand basic fraction, decimals and percentages conversions.** - Compare and order fractions whose denominators are all multiples of the same number

					ar links – PE, cookery, Science	-Identify, name and write equivalent fractions of a given fraction, represented visually. -Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] -Add and subtract fractions with the same denominator, and denominators that are multiples of the same number -Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.
Week 6	Assessment	Summative assessment based on time and timetables, algebra and fractions.				
Spring Term 2 (5 weeks) **Week 1-2**	Data WRM links – - Y8 Su4 The Data Handling Cycle	-Draw and interpret pie charts and compare. - Draw an interpret stem and leaf diagrams including identifying the median, mode and range.	Formative assessment throughout	Pie chart Interpret Stem and Leaf Median Mode Range Two-way table	Business and finance Education and research Quality control	-Interpret and construct pie charts and line graphs and use these to solve problems.

		- Construct and interpret two-way tables. - Use tables and compare data.		Compare	Cross-curricular links - Science	
Week 3-4	Index Laws WRM links – - Y8 Sp3 Indices -Y8 Sp5 Standard Index Form	- 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.	Formative assessment throughout	Indices Powers Standard form Exact Approximations	Compound interest Loan calculations Computer science Cross-curricular links – Science, computing	-Recognise **square numbers** (e.g. 1, 4, 9, 16, ...) -Recognise **cube numbers** (e.g. 1, 8, 27, ...) -Use the symbols ^{2} and ^{3}
Week 5	Assessment	Summative assessment based on data and index laws.				
Summer Term 1 (6 weeks) **Week 1**	Multiplicative Reasoning WRM links – - Y8 Au1 Ratio & Scale	- Convert metric units. - Understand ratio notation. - Simplify ratios. - Express a ratio in the form 1:n. - Express a ratio as a fraction. - Write lengths, areas and volumes of two shapes as ratios in simplest form.	Formative assessment throughout	Ratio Simplify 1:n Simplest form	Cooking and baking Mixing hair dye Art and Design Map making Cross-curricular links – Science, cookery	-Solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts

Week 2-3	Probability WRM links – - Y7 Su4 Sets & Probability - Y8 Au6 Tables & Probability - Y9 Su4 Probability	- 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.	Formative assessment throughout	Probability Probability scale Certain, likely, equal chance, unlikely, impossible Venn diagrams – notation –  Frequency trees Two-way tables Mutually exclusive	Weather forecasting Business Gaming Traffic Management Cross-curricular links – PE, Science	
Week 4-5	Solving Equations WRM links – - Y9 Au2 Forming & Solving Equations	- 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.	Formative assessment throughout	Equation Solve Linear Unknown Brackets Rearrange Substitute Formula	Engineering Data Science Aerospace engineer Games developer	-Express missing number problems algebraically. -Find pairs of numbers that satisfy an equation with 2 unknowns.

	- Y9 Su5 Simultaneous Equations	- Substitute into a formula and solve the resulting equation. - Solving one and two step equations including angle and perimeter problems using algebra. - Solve simultaneous equations using graphs. -Solve simultaneous equations with and without adjustments.			Chemist Cross-curricular links – Science, computing	
Week 6	Assessment	Summative assessment based on multiplicative reasoning, probability and solving equations.				
Summer Term 2 (7 weeks) **Week 1**	Graphs WRM links – - Y9 Straight Line Graphs	- Use positive and negative coordinates. - Draw straight line graphs. - Recognise common straight line graphs. - Calculate the gradient of a linear graph. - Find equation of linear graphs. - Identify parallel and perpendicular graphs.	Formative assessment throughout	Positive Negative Coordinates Quadrants Y=mx+c Parallel Perpendicular Axis	Project management Sales Business analyst Cross-curricular links – Science	-Describe positions on the **full coordinate grid (all four quadrants).** -Draw simple shapes on the coordinate plane.
Week 2-3	Rates WRM links – - Y9 Su3 Rates	- 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.	Formative assessment throughout	Formulas Speed – distance – time Density – mass – volume Flow	Athlete performance Vehicle performance Cross-curricular links – Science	- Solving problems involving scaling and relative sizes.

Week 4	Similarity and Congruence WRM links – - Y7 Su1 Constructing, Measuring & Using Geometric Notation -Y9 Au5 Constructions & Congruency - Y9 Su1 Enlargement & Similarity	- Identify similar and congruent triangles. - Solve angle problems involving congruence. - Solve problems to find missing lengths in similar shapes.	Formative assessment throughout	Similar Congruent Triangle Angle Length	Architecture Engineering Art and design Cross-curricular links – Art	-Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. -Compare and classify geometric shapes based on their properties and sizes.
Week 5	Pythagoras Theorem WRM links – - Y9 Sp6 Pythagoras Theorem	- Use Pythagoras to find missing lengths. - 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.	Formative assessment throughout	Pythagoras Theorem Line segment	Construction Surveying Computer graphics Cross-curricular links – Computing, art	-Find unknown angles in any triangles.
Week 6	Trigonometry WRM links – - Y10 Au2 Trigonometry	- Use trigonometric ratios to solve missing angles and sides.	Formative assessment throughout	Trigonometric ratios Sine Cosine Tangent	Engineering Navigation	

					Cross-curricular links - Science	
Week 7	Assessment	Summative assessment based on graphs, rates, similarity and congruence, Pythagoras theorem and trigonometry.				

Subject Information including exam board details:

The keystage 3 curriculum follows the scheme of work for the AQA exam board. 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. Due to the ever-changing cohort pupils will be assessed on their knowledge of each topic and then work from their starting points. 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.