Academic Learning Plan 2024-2025

Mathematics – Year 8

Intent : The Mathematics Department aims to encourage and develop the joy of problem solving. Students will leave Wadham School with essential mathematical skills for everyday life, to enable them to live their life in all its fullness. Students are actively encourage to try and sometimes fail. Mathematics is not somethings done to you but a subject that students actively engage in. Everyone is capable of being successful in Mathematics.

	Term 1			Term 2		
Year 8 Units	8.1 Ratio and scale	8.2 Multiplicative change	8.3 Multiplying and dividing fractions	8.4 Working in the Cartesian plans	8.5 Representing data	8.6 Tables and probability
Content (National curriculum)	Make connections between number relationships, and their algebraic and graphical representations Use scale factors, scale diagrams and maps Understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction Divide a given quantity into tow parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio Solve problems involving direct and inverse proportion	Extent and formalise their knowledge of ratio and proportion in workingwith measures and in formulating proportional relations algebraically Interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning Use scale factors, scale diagrams and maps Solve problems involving direct and inverse proportion, including graphical and algebraic representations Move freely between different numerical, algebraic, graphical and diagrammatic representations	Consolidate their numerical and mathematical capabilities from key stage 2 and extent their understanding of the number system and place value to include decimals and fractions Select and use appropriate calculation strategies to solve increasingly complex problems Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative	Move freely between different numerical, algebraic, graphical and diagrammatic representations Develop algebraic and graphical fluency, including understanding linear (and simple quadratic) functions Make connections between number relationships, and their algebraic and graphical representations Substitute numerical values into formulae and expressions Recognise, sketch and produce graphs of linear functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane	Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data Describe simple mathematical relationships between ow variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs Use language and properties precisely t o analyse probability and statistics	Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities Use language and properties precisely to analyse probability and statistics

Literacy	Within Core Knowledge written in exercise books and in Knowledge Organisers.					
Knowledge organiser	In booklets: Individual Student copies (all Subjects)					
Assessment	Whole year group assessment in Term 1 and 2 + Topic Exit Tickets					
GCSE AO Link	Assessing all AO					
Homework	Sparx					
CEIAG	Cartography – maps and scale factors	Hairdressing – making hair dye	Nurse – calculating medicine quantities	Engineering - formulae	Advertising – using graphs to persuade	Insurance – probability of risk
Enrichment	Termly Maths Challenge					

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	Term 3			Term 4		
Year 8 Units	8.7 Brackets equations and inequalities	8.8 Sequences	8.9 Indices	8.10 Fractions and percentages	8.11 Standard Index Form	8.12 Number Sense
Content (National curriculum)	Identify variables and express relationships between variables algebraically Begin to model situations mathematically and express the results using a range of formal mathematical representations Substitute numerical values into formulae and expressions, including scientific formulae Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors Simplify and manipulate algebraic expressions to maintain equivalence by: *collecting like terms *multiplying a single term over a bracket *taking out common factors *expanding products of two or more binomials Understand and use standard mathematical formulae Use algebraic methods to solve linear equations in one variable	Generate terms of a sequence from either a term-to-term or a position-to-term rule Recognise arithmetic sequence and find the nth term Recognise geometric sequences and appreciate other sequences that arise	Use and interpret algebraic notation, including a^3 in place of axaxa; a^2b in place of axaxb Use language and properties precisely to analyse algebraic expressions Begin to model situations mathematically and express the results using a range of formal mathematical representations Substitute values in expressions, rearrange and simplify expressions, and solve equations	Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics Work interchangeably with terminating decimals and their corresponding fractions Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100% Interpret fractions and percentages as operations	Use integer powers and associated real roots (square, cube and higher), recognise powers of 2,3,4,5 and distinguish between exact representations of roots and their decimals approximations Interpret and compare numbers in standard form A x 10^n, $1 \leq A \leq 10$, where n is a positive or negative integer or zero	Use standard units of mass, length, time, money and other measures, including with decimal quantities Round numbers and measures to an appropriate degree of accuracy (for example, to a number of decimal places or significant figures) Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a<x\leq b$ Use a calculator and other technologies to calculate results accurately and then interpret them appropriately
Literacy	Within Core Knowledge written in exercise books and in Knowledge Organisers.					
Knowledge organiser	In booklets: Individual Student copies (all Subjects)					
Assessment	Whole year group assessment in Terms 3 and 4 + Topic Exit Tickets					
GCSE AO Link	Assessing all AO					
Homework	Sparx					
CEIAG	Some money-based questions	Running a business/self employed	Setting up a bank account/buying a house	Finance or any job handling money	Astronomy – describing long distances	Practical jobs involving accurate measuring e.g. carpentry
Enrichment	Termly Maths Challenges					

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	Term 5			Term 6		
Year 8 Units	8.13 Angles in parallel lines and polygons	8.14 Area of trapezia and circles	8.15 Line symmetry and reflections	8.16 Measures of locations	8.17 The data handling cycle	Review of work from the year
Content (National curriculum)	Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles Understand and use the relationship between parallel lines and alternate and corresponding angles Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons Use the standard conventions for labelling the sides and angles of triangle ABC Derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies Derive and use the standard ruler and compass constructions (Higher only)	Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia Calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes	Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric Identify properties of, and describe the results of reflections applied to given figures	Describe, interpret and compare observed distributions of a single variable through appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)	Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers) Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data	Review, assess & reflect

Literacy	Within Core Knowledge written in exercise books and in Knowledge Organisers.					
Knowledge organiser	In booklets: Individual Student copies (all Subjects)					
Assessment	Whole year group assessment in Term 6 + Topic Exit Tickets					
GCSE AO Link	Assessing all AO					
Homework	Sparx					
CEIAG	Architect – roof construction	Gardening – laying a patio	Computer aided design	Media/advertising	Science/meteorology/climate change	Auditor
Enrichment	Termly Maths Challenge					