

Maths Curriculum Map - Year 8

Term	Units of Study	Curriculum Guidelines	NC –Aims / Focus Points
<p>Autumn 1</p>	<p>Number</p> <p>Area and Volume</p>	<ul style="list-style-type: none"> • Consolidate their numerical and extend their understanding of the number system and place value to include decimals, fractions, powers and roots. • Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems. • Select and use appropriate calculation strategies to solve increasingly complex problems. • Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics. 	<ul style="list-style-type: none"> • Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, ≤, ≥ • Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property. • Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative • Use conventional notation for the priority

of operations, including brackets, powers, roots and reciprocals

- Recognise and use relationships between operations including inverse 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 decimal approximations.
- Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders).
- Calculate and solve problems involving: perimeters of 2-D

			<p>shapes (including circles), areas of circles and composite shapes.</p> <ul style="list-style-type: none"> • Use standard units of mass, length, and other measures, including with decimal quantities.
<p>Autumn 2</p>	<p>Expressions and Equations</p> <p>Real Life Graphs</p>	<ul style="list-style-type: none"> • Students become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasing complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. • Develop algebraic and graphical fluency, including understanding linear and simple quadratic functions. • Use algebra to generalise the structure of arithmetic, including 	<ul style="list-style-type: none"> • Use and interpret algebraic notation, including: ab in place of $a \times b$; $3y$ in place of $y + y + y$ and $3 \times y$; a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$; $a^2 b$ in place of $a \times a \times b$; $\frac{a}{b}$ in place of $a \div b$; coefficients written as fractions rather than as decimals; brackets. • Substitute numerical values into formulae and expressions, including scientific formulae. • Understand and use the concepts and vocabulary of expressions, equations,

		<p>to formulate mathematical relationships.</p> <ul style="list-style-type: none"> • Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems • Substitute values in expressions, rearrange and simplify expressions, and solve equations 	<p>inequalities, terms and factors.</p> <ul style="list-style-type: none"> • 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; rearrange formulae to change the subject. • Work with coordinates in all four quadrants. • Reduce a given linear equation in two variables to the standard form $y = mx + c$; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically.
Spring 1	Decimals and Ratios	<ul style="list-style-type: none"> • Extend their 	<ul style="list-style-type: none"> • Understand and use

		<p>understanding of the number system; make connections between number relationships, and their algebraic and graphical representations.</p> <ul style="list-style-type: none"> • Consolidate their numerical and mathematical capability from Key stage 2 and select and use appropriate calculation strategies to solve increasingly complex problems • Develop their mathematical knowledge, to begin to model situations mathematically and express the results using a range of formal mathematical representations. 	<p>place value for decimals, measures and integers of any size</p> <ul style="list-style-type: none"> • Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, ≤, ≥ • Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative. • Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures].
Spring 2	Lines and Angles	<ul style="list-style-type: none"> • Select appropriate 	<ul style="list-style-type: none"> • Order positive and

Calculating with Fractions

concepts, methods and techniques to apply unfamiliar and non-routine problems.

- Consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots.
- Move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs].
- Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including

negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols $=$, \neq , $<$, \leq , $>$, \geq

- Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.
- 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

		multi-step problems	
Summer 1	<p style="text-align: center;">Straight Line Graphs</p> <p style="text-align: center;">Percentages, decimals and fractions</p>	<ul style="list-style-type: none"> • Select and use appropriate calculation strategies to solve increasingly complex problems • Consolidate their numerical and mathematical capability from Key stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots. • Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems. 	<ul style="list-style-type: none"> • Reduce a given linear equation in two variables to the standard form $y = mx + c$; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically. • Use linear and quadratic graphs to estimate values of y for given values of x and vice versa and to find approximate solutions of simultaneous linear equations. • Use scale factors, scale diagrams and maps. • Solve problems involving direct and inverse proportion, including graphical and algebraic representations.

		<ul style="list-style-type: none"> • Substitute values in expressions, rearrange and simplify expressions, and solve equations • Move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs] • Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems. • Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics 	<ul style="list-style-type: none"> • Use compound units such as speed, unit pricing and density to solve problems. • Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $2\frac{7}{10}$ or 0.375 and $8\frac{3}{10}$) • 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%. • Use a calculator and other technologies to calculate results accurately and then interpret them appropriately.
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<p>Summer 2</p>	<p>Statistics, graphs and charts</p>	<ul style="list-style-type: none"> • Extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representation 	<ul style="list-style-type: none"> • Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and

		<ul style="list-style-type: none"> • Move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs]. • Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally. 	<p>appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)</p> <ul style="list-style-type: none"> • 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 two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs.
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