

Maths Curriculum Map - Year 9

Term	Units of Study	Curriculum Guidelines	NC –Aims / Focus Points
Autumn 1	Number	<ul style="list-style-type: none"> • 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. • Select and use appropriate calculation strategies to solve increasingly complex problems. • Extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations • Develop their mathematical knowledge, in part through solving problems and evaluating the 	<ul style="list-style-type: none"> • Understand and use place value for decimals, measures and integers of any size. • 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

		<p>outcomes, including multi-step problems.</p> <ul style="list-style-type: none"> • Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics 	<p>numbers, all both positive and negative .</p> <ul style="list-style-type: none"> • 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.
<p>Autumn 2</p>	<p>Algebra</p>	<ul style="list-style-type: none"> • Use algebra to generalise the structure of arithmetic, including formulating mathematical relationships. • Substitute values in expressions, rearrange and simplify expressions, and solve equations. • Move freely between 	<ul style="list-style-type: none"> • Understand and use place value for decimals, measures and integers of any size. • Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of

		<p>different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs].</p> <ul style="list-style-type: none"> • Develop algebraic and graphical fluency, including understanding linear and simple quadratic functions. • 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. 	<p>the real numbers; use the symbols =, ≠, , ≤, ≥</p> <ul style="list-style-type: none"> • 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.
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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; rearrange formulae to change the subject.
- Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs.
- Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement).

Spring 1

Graphs, tables and charts

Fractions

- Extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representation.
- Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally.
- Begin to model situations mathematically and express the results using a range of formal mathematical representations.
- Consolidate their numerical and mathematical

- Draw and measure line segments and angles in geometric figures, including interpreting scale drawings
- Derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line.
- 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

		<p>capability from key stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots.</p> <ul style="list-style-type: none"> • Select and use appropriate calculation strategies to solve increasingly complex problems. • Move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs]. • Interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning. • Develop their mathematical 	<p>rotationally symmetric.</p> <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 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. • Describe simple mathematical relationships between two variables (bivariate
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		<p>knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems.</p>	<p>data) in observational and experimental contexts and illustrate using scatter graphs.</p> <p>Order positive and 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 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.</p>
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			<p>Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $\frac{2}{7}$ or 0.375 and $\frac{3}{8}$). Interpret fractions and percentages as operators.</p> <ul style="list-style-type: none"> •
<p>Spring 2</p>	<p>Percentages Equations, inequalities and sequences</p>	<ul style="list-style-type: none"> • 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. • Select and use appropriate calculation strategies to solve increasingly complex problems. • Interpret when the structure of a numerical problem requires additive, multiplicative or proportional 	<p>Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative Interpret fractions and percentages as operators</p> <ul style="list-style-type: none"> • 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

		<p>reasoning.</p> <ul style="list-style-type: none"> • Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems. • Make and test conjectures about patterns and relationships; look for proofs or counterexamples. 	<p>using percentages, and work with percentages greater than 100%</p> <ul style="list-style-type: none"> • Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]. • Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors. <p>Generate terms of a sequence from either a term-to-term or a position-to-term rule.</p> <p>Recognise arithmetic sequences and find the nth term.</p> <p>Recognise geometric sequences and appreciate other sequences that arise.</p>
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Summer 1

Angles

Averages and range

- Extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically.
- Begin to reason deductively in geometry, number and algebra, including using geometrical constructions.
- Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems.

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- Understand and use place value for decimals, measures and integers of any size.
- Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.
- Recognise and use relationships between operations including inverse operations.
- 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 $a < x \leq b$

			<ul style="list-style-type: none">• 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.• Use the standard conventions for labelling the sides and angles of triangle ABC, and know and use the criteria for congruence of triangles.• Derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies.• Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures.• Identify and construct
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			<p>congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids</p> <ul style="list-style-type: none">• 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• 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)
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			<p>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.
<p>Summer 2</p>	<p>Perimeter, area and volume 1</p>	<ul style="list-style-type: none"> • 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. • Select and use appropriate calculation strategies to solve increasingly complex problems. • Develop their 	<ul style="list-style-type: none"> • Use standard units of mass, length, time, money and other measures, including with decimal quantities. • Understand and use place value for decimals, measures and integers of any size. • Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both

		<p>mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems.</p> <ul style="list-style-type: none"> • Select appropriate concepts, methods and techniques to apply to unfamiliar and nonroutine problems. 	<p>positive and negative.</p> <ul style="list-style-type: none"> • 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 shapes (including circles), areas of circles and composite shapes.
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