



Maths department curriculum intent

Department curriculum intent:

In maths at Settle College, we aim for all pupils to have strong numerical skills with emphasis on their financial literacy, making them ready for the real world. The curriculum is structured and sequenced to constantly build on prior knowledge to develop fluency in mathematical concepts and apply these skills to solving problems between different parts of mathematics. Pupils will see the connectivity between topics and draw conclusions through mathematical reasoning. Within each topic, students are provided with opportunities to see the importance of maths in future careers such as the fields of engineering, physics, architecture, medicine and business.

In Year 7, pupils will start by developing their fundamental non- calculator number skills. They will build on their KS2 knowledge of place value, decimals, fractions and negative numbers. These skills will then be applied to geometric problems. Formal algebraic skills are introduced to develop the understanding of generalisation and are incorporated into a range of topics to support pupils understanding that topics are linked.

In Year 8 pupils extend their knowledge of algebra to form and solve equations and learn how data can be analysed, represented, and manipulated. Pupils will familiarise themselves with calculators and when to use them for efficiency. Ratios will be a key focus linking numeracy, geometry, and algebra together, as well as the uses for map scales, recipes, and proportional reasoning. In year 9, students focus on geometry and how percentages are used to calculate wages, bills, and interest rates.

At key stage 4, pupils start their GCSE course, where pupils are taught to apply their key stage 3 knowledge to more complex problems, exploring the dimensions and angles of shapes and bearings using Pythagoras and trigonometry. Pupils will be taught how to justify their choice of statistical diagrams to represent data and how to identify misleading results. The mathematics GCSE covers a wide range of topics, including the use of formulas to help solve problems involving 2D and 3D shapes.



Curriculum mapping

Year 7	Overall curriculum intent for year 7: Identify gaps for the students on their arrival to Settle College, secure basic non-calculator number skills, whilst introducing formal algebraic concepts beyond those introduced in KS2.						
		Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
	Intent for the topic	Recognise algebra as a generalised version of arithmetic that uses variables to stand for unspecified numbers. Confidence in using place value and using addition and subtraction, applying it to other topics in such as perimeter.	Confidence using multiplication and division and applying it to area.	Developing knowledge of working with different types of numbers, such as directed number, multiples, factors, prime numbers and fractions, mixed and improper. Generate and describe sequences.	Fluency in fractions, decimals and percentage equivalence, to then relate to fraction and percentages of amounts.	Recognise that algebra gives us a new tool to understand mathematical situations in the real world, where there are unknowns. Develop knowledge of measuring, notation and constructing angles.	Introduction to sets and probability. Confidence when working with powers and roots. Building on prime numbers to prime factorisation and its uniqueness.
	Content mapping	Algebraic notation for collecting like terms and substitution. Use written calculation methods to add and subtract integers and decimals. Correctly apply BIDMAS. Convert measures for length. Find perimeters of shapes.	Use written calculations methods to multiply and divide integers and decimals. Find the areas of shapes (rectangles, triangles and parallelograms), including composite shapes.	Factors, multiples, primes (including why 1 isn't a prime number). Calculating with directed numbers. Adding and subtracting proper/mixed fractions. Sequences, using a term-to-term rule and nth term rule.	Convert between fractions, decimals and percentages, improper fractions, and mixed numbers. Calculating, increasing and decreasing by fractions of amounts and by a given percentage.	Solve one-step, two-step, and multi-step equations. Constructing and measuring angles. Using angle notation. Use properties of 2D shapes. Calculating angles on a straight line, around a point, in a triangle and in quadrilaterals.	Probability, using fractions and decimals, and Venn diagrams. Highest common factor and lowest common multiple.
	Key skills developed	Algebraic notation, simplifying and like terms. Inequalities to compare numbers. Solve problems using inverse operations. Find the missing lengths on diagrams to find the perimeter.	Place value and rounding. Finding the area of parallelograms and triangles and understanding the units. Derive the formulae for triangles and parallelograms.	Use multiples & factors to solve problems. Addition and subtraction of fractions and positive and negative integers. Describing a number sequence using the starting number and a term-to-term rule.	When to use the best equivalent of FDP. Converting fractions to D/P and using a given fraction to find the whole. Using percentages (even if greater than 100%) in real-life situations.	Solve linear equations by balancing and rewriting equations. Angles in triangles and quadrilaterals. Classifying shapes and angles by their properties.	Justify probabilities. Estimations and expectations from probabilities. Estimate square roots. Write LCM as a product using index notation.



Year 8	Overall curriculum intent for year 8: In Year 8, pupils extend their knowledge of algebra to form and solve equations and learn how data can be analysed, represented, and manipulated. Pupils will familiarise themselves with calculators and when to use them for efficiency. Ratios will be a key focus linking numeracy, geometry, and algebra together, as well as the uses for map scales, recipes, and proportional reasoning.					
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
	Intent for the topic Recognise types of sequences and their structure. Structure of our place-value system and rounding numbers. Multiplication and dividing involving fractions. Theoretical and experimental probabilities differ.	Recognise that direct proportion is a relation between two quantities. 'Ratio' tells us the relative sizes of two or more things. We will explore what that means and how to tell when two ratios are the same and when they aren't. Generate, plot and identify relationships between coordinates. Construct and describe reflections.	Construct and interpret data, charts and graphs as a way of comparing information.	Expanding and factorising are reverse processes. Understanding equations and how to solve them with reverse operations. Understand the characteristics of sequences. Understand that some numeric sequences can be described by a non-mathematical rule. Familiarise with calculator functions.	Simplifying expressions involving indices and the effects of using powers less than 1. Standard form is a way of writing very small or very large numbers so that they are easier to understand and calculate with. Multipliers are used when calculating more complex percentage and financial problems.	Explore relationships between angles when they meet at a point, or on a straight line or when they are on parallel lines. Explore interior and exterior angles in polygons. Calculate the circumference of a circle and part circles. Calculate the area of trapeziums and circles.
	Content mapping Types of numbers and sequences Round and estimate Multiply and divide fractions Probability	Ratio & Scales Proportion Working in the Cartesian Plane Line Symmetry & Reflection	Averages and Range The Data Handling Cycle	Expanding and Factorising Solving equations Sequences Using a calculator	Indices Standard Form Fractions & Percentages	Angles in Parallel Lines & Polygons Area of Trapeziums & Circles
	Key skills developed Round to a given number of decimal places or significant figures. Reciprocals to divide fractions. Limitations to theoretical probabilities.	Importance of orders in ratios and equivalent ratios. Choosing the amount to take as 100% or a whole. Linear graphs are given in the form $y=mx+c$. Can the mirror line be on or through a shape?	Understand that range is a measure of spread. Analyse and compare data, appreciating the limitations of different averages. Different charts for different contexts.	Different factors when factorising. Using HCF to fully factorise expressions. Expanding brackets. To use an nth term rule for sequences. Multi-step calculations.	Explain why negative indices give a reciprocal and a power of 0 gives an answer of 1. Percentage increase or decrease. The format for standard form.	Prove the rule for the sum of the interior angles of a polygon by counting triangles. Area of a trapezium formula uses the parallel sides and perpendicular height.



Year 9	Overall curriculum intent for year 9: students focus on geometry and how percentages are used to calculate wages, bills, and interest rates.						
		Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
	Intent for the topic	The interconnections of algebra, by expanding brackets and rearranging. Interpreting graphs and modelling different situations.	Volumes and surface areas, which change based on the shape’s faces, lengths of edges and number of vertices. Geometric properties of key shapes are used in standard constructions.	Scatter graphs are a way of representing the relationship between two variables	Linear and quadratic functions, and how linear graphs can solve simultaneous equations. The information required to describe a rotation (centre of rotation, size and direction of rotation)	Scale up and down using ratio, proportion, including enlargement. Convert confidently between units and recognise the units associated with compound measures.	Pythagoras and trigonometric functions are used in obtaining unknown angles and distances from known or measured angles in geometric figures.
	Content mapping	Expanding Brackets Rearranging Straight Line Graphs	Three Dimensional Shapes Constructions & Congruency	Scatter Graphs Using Percentages Maths & Money	Deduction Non-Linear Graphs Rotation & Translation	Enlargement & Similarity Solving Ratio & Proportion Problems Compound Measures	Pythagoras Theorem Trigonometry
	Key skills developed	Applying division and multiplication to every term. That coordinates can be represented algebraically and graphically. That a graphical representation shows all of the points within a range that satisfy a relationship and how the sequence in a table relates to the equation of the line. That a line represents an infinite set of points that all fit the rule.	Use knowledge of the net of a cylinder to derive to a formula to calculate surface area of a cylinder. Accurate use of protractor and compasses. Classifying shapes by their properties.	Recognise if correlation is possible and whether it is positive or negative from a graph – justify why this may be. Why and how the repeated percentage indices operate.	Using reasoning to explain the steps of working when solving angle problems. Use counterexamples to show that conjectures are not true. When a shape has been rotated or translated, the object and image are congruent. Vector notation is used when describing a translation.	Angles do not change size when the shape is enlarged and so the shape is similar. Solve problems to find missing lengths in similar shapes. Change freely between related units (e.g. time, length area, volume/ capacity) and compound units (e.g. speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts.	Using Pythagoras Theorem to prove right angled triangles. Why using the ANS button/accurate values is important in multistep problems.



Year 10		Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
	Intent for the topic	Understanding that indices, roots, surds and standard form are all interconnected and are different representations of numbers.	Recognise that bearings are an effective way to describe a direction	Identify and use appropriate graphical representation involving discrete, continuous and grouped data. Use the concepts of product notation to identify the unique factorisation property of numbers.	Build on students' experience to solve all types of ratio problems and make links with fractions, direct proportion and graphs.	Show expressions are equivalent and use algebra to construct arguments. Students have access to familiar and unfamiliar formulas, appreciating that the order of operations and inverse operations relate to all expressions and equations.	Using algebraic equations with other topics in mathematics and working with unknowns to support solving problems. Connecting topics, such as Pythagoras Theorem, plans and elevations to calculate volume and surface area of composite shapes.
	Content mapping	Sequences Indices, Roots, Surds & Standard Form	Trigonometry Angles & Bearings	Data Handling Types of Numbers, HCF/LCM and Prime factorisation	Expanding and factorising Ratios Fractions	Percentages Venn diagrams, Probability, Changing the subject	Vectors Forming and solving equations, 2D and 3D shapes
	Key skills developed	Standard form is based on powers of 10 to express how big or small a number is, where powers can be a positive or negative whole number and that a negative power does not give a negative number. Changing numbers into standard form after a calculation has been carried out. Answers left in surd form as exact answers.	The ratio of corresponding sides in similar triangles is constant. How to choose the trigonometric ratio that can be used in a given situation. Ways to use trigonometry to solve problems involving an angle of depression or an angle of elevation. Apply exact trig values to find angles and lengths in right angled triangles.	Reading scales Identify the LCM/ HCF by listing and using prime factorisation	How to combine or split ratios	The subject of the formula is the variable that is being worked out and that it can be recognised as the letter on its own side of the equals sign. Use inverse operations to manipulate and balance formulae. Create Venn diagrams for given sets and find linked probabilities.	Properties of 2D and 3D shapes. A quadratic equation can have 0, 1 or 2 solutions. Identify and draw the front, side and plan elevation. Splitting a composite shape to find its area. Calculate exactly with multiples of pi. Ways to use Pythagoras theorem to find missing lengths/heights in pyramids or cones.



Year 11		Half term 1	Half term 2	Half term 3	Half term 4	Half term 5
	Intent for the topic	Identify different types of graphs using their shapes and key characteristics. Algebraic expressions and equations can be manipulated and formed to represent different situations and that they are a way of calculating an unknown.	Develop students' multiplicative reasoning in a variety of contexts, from simple scale factors through to complex equations involving direct and inverse proportion.	Consolidate their knowledge of angle facts and develop increasingly complex chains of reasoning to solve geometric problems. Exploring transformations and constructions, relating these to symmetry and properties of shapes, describing transformations using the correct language	. Inferences in statistical and probabilistic settings and expressing arguments formally. "Show that" to communicate in a clear mathematical fashion, transferring this to their writing of solutions to any type of question.	Revision
	Content mapping	Linear Graphs Compound measures Speed, distance & time 'Show that'	Congruency, similarity & enlargement Direct & inverse proportion Angles (circle theorems) Non-linear graphs Inequalities	Transformations Functions Bounds	Pythagoras & trigonometry Data	Revision
	Key skills developed	Recognise that the point of intersection of two linear graphs satisfies both relationships and hence represents the solution to both those equations. Rearranging an equation into the form $y=mx+c$ to identify the gradient and y-intercept. Ways of checking if a point lies on the line.	Use inverse operations to manipulate and balance formulae. Order of expanding single, double and triple brackets is important, so terms do not get missed. Factorised answers can be checked by expanding. Identifying if problems are direct or inverse proportion. Ways of applying the unitary method when solving problems with more difficulty numbers (non-calculator method). Representing solutions to inequalities on number lines.	When and why invariant points can occur. Identifying the centre of enlargement and scale factor. The subject of the formula is the variable that is being worked out. It can be recognisable as the letter on its own on side of the equal sign.	Negative powers are reciprocals.	Revision