

Year 7

In this year we reinforce and build on the knowledge and skills students have developed in the primary curriculum, and begin to extend the big ideas from the Primary curriculum into our core concepts. In Autumn 1, we use **multiple representations** to build **conceptual understanding** of number and number properties in students schemas. Moving through to Autumn 2, for many students this is the first time they will be introduced to algebra formally. In their Primary education they will have seen and understood the idea of a “missing number” or “unknown”, and may have seen inequality signs, but tier 2 and tier 3 language like “co-efficient, variable, equation, inequality, expression, term, constant” will be new, so careful attention to modelling **mathematical language and notation**, and a focus on building **fluency** in basic algebra skills will be crucial. Moreover, a **conceptual understanding** of algebra as a generalised version of arithmetic will develop by building on the work done in Autumn 1. In Spring 1 and Spring 2 students learn about Geometry for the first time at Secondary. They build on their understanding of shape, space, and basic transformations to understand more formal ideas like the Cartesian plane. In this term students will properly encounter many of the of the higher-level core concepts like **mathematical reasoning** and **problem-solving**. In Summer 1, students build on the **conceptual understanding** that was built in Y7 Autumn 1 to develop **fluency** in operations on fractions. Finally, in Summer 2, students’ **mathematical thinking** is focused on, as students are required to **think proportionally** in different scenarios, and with different **mathematical language and notation**.

	<u>Learning Period 1: Autumn</u>	<u>Learning Period 2: Autumn</u>	<u>Learning Period 3: Spring</u>	<u>Learning Period 4: Spring</u>	<u>Learning Period 5: Summer</u>	<u>Learning Period 6: Summer</u>
Topic title	Making generalisations about the number system	Making generalisations about the number system 2	2D Geometry	Ratio and percentages	Factors and fractions	2D geometry
Relevant core concepts	Mathematical fluency	Mathematical representation, language, and notation Conceptual understanding	Mathematical representation, language, and notation. Mathematical thinking	Mathematical fluency Problem-solving	Mathematical fluency	Mathematical fluency Mathematical representation Conceptual understanding
Key questions	<ul style="list-style-type: none"> - What number bases do we use on a daily basis? - What is the relationship between multiplication and division? - What is the difference between a factor and a multiple? - What is BIDMAS and why is it important? 	<ul style="list-style-type: none"> - How do I calculate with negative numbers? - How can I use algebra to generalise ideas? - What is balancing and how do I use it to solve equations? 	<ul style="list-style-type: none"> - How do I use a protractor to measure and draw angles? - How can I use angle facts to find missing angles? - How can I use mathematical equipment to construct triangles and quadrilaterals accurately? 	<ul style="list-style-type: none"> - What is ratio and how do I represent it using a diagram? - How can I use the Singapore bar model to solve problems involving ratio? - What is the relationship between fractions, decimals and percentages? - How can I convert a percentage into a decimal multiplier? 	<ul style="list-style-type: none"> - How do I use a Venn diagram to find the HCF and LCM of two or more numbers? - How can I use the equivalence of fractions to convert between different forms? - How can I use equivalence to add and subtract fractions with different denominators? 	<ul style="list-style-type: none"> - How can I use co-ordinates to identify points on a grid? - How can I use mathematical formulae to calculate area of different shapes? - How can I transform shapes around a grid?
Key knowledge/ concepts and skills	<p><u>Unit 1 - Numbers and numerals</u> Understanding of time as a different base system Understand how the decimal system works and how our numbers are formed Be able to use column method to add and subtract numbers including decimals.</p> <p><u>Unit 2 - Recognising patterns with multiplication</u> Multiplication – introduction of the Napier’s bones grid as an alternative to long multiplication including decimals. Division methods including decimals. Understanding the relationship between multiplication and division</p> <p><u>Unit 3 - Factors and multiples</u> Being able to identify different types of numbers, such as factors, multiples, squares and primes. Finding highest common factor and lowest common multiple of two numbers by listing. Writing a number as a product of primes</p> <p><u>Unit 4 - Order of operations</u> Know the importance of BIDMAS and be able to apply it to different calculations.</p>	<p><u>Unit 4a – Averages</u> Calculating the mean, mode, median and range of a data set</p> <p><u>Unit 5 - Positive and negative numbers</u> Ordering positive and negative numbers. Performing the 4 operations with negative numbers.</p> <p><u>Unit 6 - Introducing sequences, expressions and equations</u> Forming algebraic expressions. Simplifying algebraic expressions. Expanding single brackets. Solving one and two step equations</p>	<p><u>Unit 7 - Angles</u> Estimating angles. Drawing angles using a protractor. Using basic angle fact such as angles in a triangle. Introduction to parallel and perpendicular lines.</p> <p><u>Unit 8 - Classifying 2D shapes</u> Identifying quadrilaterals and their properties. Introduction to terms such as similar, congruent and symmetry.</p> <p><u>Unit 9 - Constructing triangles and quadrilaterals</u> Drawing triangles and quadrilaterals using protractors and rulers.</p>	<p><u>Unit 10 - Ratio</u> Simplifying ratios. Using the Singapore bar method to enable students to share in given ratios.</p> <p><u>Unit 11 - Percentages</u> Exploring the link between fractions, decimals and percentages. Calculating percentages of amounts both using non-calculator methods and multipliers.</p>	<p><u>Unit 12 - Prime factor decomposition</u> Developing understanding of index notation. Using Venn diagrams to find the HCF and LCM of two numbers</p> <p><u>Unit 13 – Equivalent Fractions</u> Identifying equivalent fractions, simplifying fractions and converting between mixed numbers and improper fractions.</p> <p><u>Unit 14 – All operations acting on fractions</u> Adding/subtracting fractions with the same and different denominators, to include mixed numbers</p>	<p><u>Unit 15 - Coordinates</u> Plotting and reading co-ordinates on a 2D plane. Finding midpoints between 2 co-ordinates. Drawing vertical and horizontal lines such as $x=4$</p> <p><u>Unit 16 - Area of 2D shapes</u> Calculating area of triangles, rectangles and squares. Developing into area of compound shapes.</p> <p><u>Unit 17 - Transforming 2D figures</u> Identifying and performing transformations of 2D shape using rotation, reflection, translation and enlargement.</p>
Assessment / Educational Visit Opportunities	Baseline assessment Autumn 1 assessment		Mid year assessment	Spring 2 assessment Junior Maths Challenge		End of Year 7 Assessment