

# Mathematics – Year 7

	Year 7 – Term 1	Year 7 – Term 2	Year 7 – Term 3
<b>What do we teach?</b>	<ul style="list-style-type: none"> <li>Numerals.</li> <li>Axioms and Arrays.</li> <li>Factors and Multiples.</li> <li>Order of Operations.</li> <li>Positive and Negative Numbers.</li> <li>Expressions and inequalities.</li> </ul>	<ul style="list-style-type: none"> <li>Angles and shape classifications.</li> <li>Constructions.</li> <li>Coordinates.</li> <li>Areas of 2D shapes.</li> <li>Transformations of 2D shapes.</li> </ul>	<ul style="list-style-type: none"> <li>Prime factor decomposition.</li> <li>Equivalent fractions.</li> <li>All operations on fractions.</li> <li>Ratios.</li> <li>Percentages.</li> </ul>
<b>How does this meet the national curriculum?</b>	In this unit students experience a range of number and numeral systems to develop their understanding of the base 10 place value system from primary years. This provides students with a context in which to explore decomposition and regrouping of number – cross reference pages 5 and 6 of the KS3 national curriculum.	This unit covers estimating, measuring, drawing and calculating angles. Students must use correct mathematical language to describe, classify and identify types of angles using clear vocabulary, and measure and draw angles accurately. Students revise facts involving angles from experiences in primary school – cross reference page 8 of the KS3 national curriculum.	In this unit, students revisit the composition of numbers developed in the Autumn Term. The uniqueness of the prime number decomposition, for which indices notation is used, is explored. This is used to show properties of particular numbers e.g. if a number is a square or cube number and therefore identify square and cube roots – cross reference pages 5 and 7 of the KS3 national curriculum.
<b>Why does this knowledge matter?</b>	This enables students to review their understanding of how numbers are connected to each other and facilitate the development of number sense, without which further knowledge and skills cannot be gained. Their knowledge of algebra will be essential throughout their time studying mathematics and beyond – cross reference pages 4 and 5 of the KS3 national curriculum.	Students will begin to develop the skills needed to make generalisations about angle facts and investigate geometric properties of 2D shapes. Over time, students should be able to use geometric properties to solve problems – cross reference pages 4 and 5 of the KS3 national curriculum.	This knowledge enables students to recognize how abstract and pictorial representations can be used to model contextual problems before solving them. It is also allows students to see real-world examples of how maths will be useful for them day-to-day e.g. shopping - cross reference pages 4 and 5 of the KS3 national curriculum.
<b>Why do we teach in this sequence?</b>	These topics provide students with opportunities to develop depth in mathematical thinking and exploring the use of commutativity, associativity and distributivity when doing mental and written calculations.	The sequence enables students to gain knowledge and understanding of key properties of angles and shapes and then moves onto constructions which develop motor skills and coordination when working with topics centred around shape and spatial awareness.	This sequence introduces: bar models, line models and rectangular representations and encourages students to use these to help them solve and demonstrate understanding of the problems even where not stated explicitly. Graduated problems require students to use all of these relationships that help develop and expand students' conceptual understanding.
<b>What career links are made?</b>	Students need numeracy and number sense skills for most professions, including retail, banking, business, finance, science and research. The problem solving knowledge that is required in algebra is applicable to various jobs and situations.	Jobs that require good spatial awareness and understanding of shape include: engineering, architecture, town planning, landscape gardening, construction.	An understanding of how numbers are linked helps with careers where accurate and detailed calculations are required. A vast array of jobs require a knowledge of fractions and percentages in order to calculate quantities, prices and more.

# Mathematics – Year 8

	Year 8 – Term 1	Year 8 – Term 2	Year 8 – Term 3
<b>What do we teach?</b>	<ul style="list-style-type: none"> <li>Percentages recap and using calculators accurately.</li> <li>Primes and factorizing. recap</li> <li>Positive and negative numbers recap</li> <li>Sequences expressions and Equations.</li> <li>Forming and solving inequalities</li> <li>Accuracy and Estimation</li> </ul>	<ul style="list-style-type: none"> <li>Ratios and calculations using compound measures (inc using of calculators).</li> <li>Linear Graphs</li> <li>Real Life graphs and rates of change</li> <li>Direct and Inverse proportion</li> <li>Rounding and estimation and percentage change review.</li> <li>Univariate and Bivariate Data</li> </ul>	<ul style="list-style-type: none"> <li>Circumference and area of circle including basic circle geometry and theorems.</li> <li>3D shapes and nets.</li> <li>Surface area and volume of 3D shapes.</li> <li>Angles in Polygons</li> <li>Bearings</li> </ul>
<b>How does this meet the national curriculum?</b>	Students are given the opportunity to understand how to interpret and compare numbers and use skills and knowledge gained from year 7 to make connections between number relationships and their algebraic representations – cross reference pages 5, 6 and 7 of the KS3 national curriculum.	Students are expected to derive and apply formulae connected to area, perimeter and volume and use knowledge and generalisations gained in year 7 to do calculations involving shapes and angles – cross reference pages 6, 7 and 9 of the KS3 national curriculum.	Students use knowledge of 2D shapes and angles and use and apply this to 3D problems involving volume and surface area. Data Handling focuses on students being able to describe, interpret and compare data distribution. Bearings enable students to develop spatial awareness, direction and positioning of coordinates – cross reference page 8 of the KS3 national curriculum.
<b>Why does this knowledge matter?</b>	This section enables students to do financial calculations through percentage change and recap on prior knowledge using directed number and integers and non-integers – cross reference pages 4 and 5 of the KS3 national curriculum.	This unit focuses mainly on shape and space and how to use angles to investigate geometric properties in 2D and 3D. Also prior knowledge around percentages is interleaved here – cross reference pages 4 and 5 of the KS3 national curriculum.	This unit gives students an appreciation of how shapes are constructed and made up of a number of composite parts– cross reference pages 4 and 5 of the KS3 national curriculum. Knowledge of bearings is useful cross-curricular and extra – curricular in Geography and for Duke of Edinburgh respectively
<b>Why do we teach in this sequence?</b>	Without a recap on general number skills it would be difficult for students to make further links in algebra and problem solving, such as expansion and collecting of like terms.	This sequence gives students the opportunity to revisit skills around angle properties and introduces them to the idea of inferring, deriving, concluding and making generalisations.	This extends on from and uses skills gained in the shape and space topics covered in Term 2.
<b>What career links are made?</b>	More complex number skills are useful for careers in accountancy, mechanics, and engineering.	Useful for technical careers such as engineering, computer programming and web design.	This unit is useful for careers involving technical skills and knowing how components work and fit together, such as careers in mechanics and a tool programmer.

# Mathematics – Year 9

	Year 9 – Term 1	Year 9 – Term 2	Year 9 – Term 3
<b>What do we teach?</b>	<ul style="list-style-type: none"> <li>Coordinates.</li> <li>Linear graphs and quadratics.</li> <li>Direct and inverse proportion.</li> <li>Scales and standard form.</li> <li>Sequences.</li> <li>Expanding and Factorising.</li> <li>Changing the subject of a formula.</li> </ul>	<ul style="list-style-type: none"> <li>Constructions.</li> <li>Congruence and similarity.</li> <li>Triangles and quadrilaterals.</li> <li>Angles in polygons.</li> <li>Linear equations and inequalities.</li> <li>Simultaneous Equations.</li> <li>Quadratic and other graphs.</li> <li>Introduction to Pythagoras and Basic Trigonometry</li> </ul>	<ul style="list-style-type: none"> <li>Trigonometry recap</li> <li>Transformations.</li> <li>Probability.</li> <li>Mean from grouped data.</li> <li>Comparing distributions.</li> <li>Scatter graphs and correlation.</li> </ul>
<b>How does this meet the national curriculum?</b>	Students develop fluency in being able to move freely and confidently between numerical, algebraic, graphical, and select and use appropriate calculation to solve increasingly complex problems and, diagrammatic representations. Cross reference pages 5, 6 and 7 of the KS3 national curriculum.	Students solve numerical and algebraic problems, modeling situations mathematically and expressing results using a range of mathematical representations – cross reference pages 6, 7 and 8 of the KS3 national curriculum. They also practice and develop skills involving construction and accuracy – cross reference page 8 of the KS3 national curriculum.	Students derive and apply formulae to solve problems involving similar and right-angled triangles – cross reference page 8 of the KS3 national curriculum. Students also start to develop skills of enquiry, analysis and inference through appropriate statistical techniques – cross reference page 9 of the KS3 national curriculum.
<b>Why does this knowledge matter?</b>	Students can reason mathematically, and apply algebraic techniques to solve contextual problems. Sequences gives students the ability to recognize and create patterns that help make predictions based on observations – cross reference pages 4 and 5 of the KS3 national curriculum.	Students need to gain an understanding of how geometric properties of shapes, determine how they are constructed. Enabling students to improve skills, accuracy and motor skills through constructions. Introduction to formal proof of theorems, skill that will be needed in KS4 and 5 – cross reference pages 4 and 5 of the KS3 national curriculum.	Collection, collation and analysis of data enables students to investigate hypotheses and refine models. Application of prior knowledge and showing links between linear graphs and lines of best fit – cross reference pages 4 and 5 of the KS3 national curriculum.
<b>Why do we teach in this sequence?</b>	The topics recaps prior learning enabling students to recall and apply knowledge and thus lay secure foundations on which to build upon conceptual understanding in preparation for Key Stage 4.	Accuracy in construction prepares them for further investigation of the geometric properties of shape in KS4. Accurate graph plotting and analysis can be used across other disciplines such as Science, Geography and ICT.	Student can use and apply their knowledge of triangle properties from year 7 and 8 to develop an understanding of how similarity and ratio link to Pythagoras' Theorem. Statistical analysis complements calculations around averages and analysis of data done in Science and provides the foundation for further statistical analysis and comparing linear and bi-variate data for G.C.S.E – cross reference page 9 of the KS3 national curriculum.
<b>What career links are made?</b>	Useful for careers that require high levels of mathematical problem solving and reasoning such as programming, and HVAC technician.	Useful for careers where a sound knowledge of geometric properties of shapes is required for example in the aviation and aerospace industry.	Useful skills are gained here that require investigative approaches to tasks, such as a statistician, econometrician, actuary, researcher.