

Timeline	Topic	Key concepts and knowledge	Skills development	Rationale
Half Term 1	<p>Algebra – Sequences</p> <p>Number – Operations</p> <p>Statistics – Handling Data</p> <p>Algebra – Algebraic Manipulation</p>	<p>Recognising and describing patterns. Identifying position to term and term to term rules.</p> <p>Written and mental methods for four operations with positives, negatives and decimals.</p> <p>Calculating an average or the range. Draw and interpret bar line graphs and pictograms.</p> <p>Using correct algebraic notation and definitions. Collecting like terms. Expanding single brackets and factorising into a single bracket.</p>	<p>In the first half term we want to look at developing the students’ resilience and effort. Lower ability students lack confidence and feel that they cannot access any maths.</p> <p>There will also be a focus on the students’ behaviour to help maximise all students’ progress. Positivity and a supportive classroom environment will help nurture the students.</p> <p>Being able to spot patterns and predict what will happen next is important in many fields.</p> <p>The ability to confidently calculate with all types of numbers is a skill that is attractive to many employers.</p> <p>Understanding of charts, graphs and averages will result in students being able to confidently interpret data that is presented to them in a workplace.</p>	<p>Understanding how to interpret data will aid students in interpreting data that is presented to them in the media, such as in news reports and articles or as part of a political party’s election material.</p> <p>Many sequences appear in everyday life, as well as occurring in nature. For example, the Fibonacci sequence appears in the number of petals on flowers and the population growth from a single pair of rabbits.</p> <p>It should be stressed to students that being adept at algebra means that many problems encountered in life can be solved, such as how much to pay a plumber if you know the call out cost and cost per hour (substitution) or those involving working out missing information, such as how much of a certain material can be bought for a set amount of money.</p> <p>Negative numbers can be linked to temperature and profit/loss. Calculating “across zero” is something that is used regularly.</p>

Half Term 2	<p>Number – Rounding and Limits</p> <p>Geometry – Perimeter and Area</p> <p>Number – Fractions and Decimals.</p> <p>Ratio</p>	<p>Rounding to a given power of 10, decimal places or significant figures. Approximating an answer.</p> <p>Calculating the perimeter of a 2D shape. Calculating the area of a rectangle, triangle, parallelogram and trapezium. Calculate the area of a composite shape. Work with the surface area of cuboids.</p> <p>Work with equivalent fractions and decimals. Add, subtract, multiply and divide fractions and decimals.</p> <p>Use ratio notation. Simplify a ratio. Write a ratio using the notation 1 : n and n : 1. Share an amount into a given ratio.</p>	<p>We now want students to develop a consistent approach to their work.</p> <p>Also to develop basic mathematical skills to help deal with the problem solving aspect of the course.</p> <p>Developing spatial awareness in terms of the size of objects with real life examples to calculate perimeter, area and volume.</p> <p>The ability to calculate with numbers, either accurately or approximately, is a skill that many employers would expect.</p>	<p>Teaching fractions allows for teaching historical discovery and use, e.g. the use of unit fractions (Egyptian) and the development of the layout of modern fractions (Arabic).</p> <p>Working with perimeter, area and volume are concepts that allow students to access a variety of jobs including an architect, interior design and a builder.</p>
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Half Term 3	<p>Geometry – Angles</p> <p>Algebra – Solving Linear Equations</p> <p>Number - Percentages</p>	<p>Measuring and drawing angles. Identifying types of angles. Understanding and using the properties of angles in triangles, quadrilaterals and parallel lines.</p> <p>Solving linear equations with one or two steps, which can also include brackets.</p> <p>Calculating the percentage of an amount with or without a calculator. Understanding and using decimal multipliers. Increasing or decreasing amounts by a percentage.</p>	<p>Continue to promote the skills introduced in the previous term and start to deal with dealing with problem solving tasks.</p> <p>Develop their drawing skills by stressing the idea of accuracy when using either a ruler or a protractor.</p> <p>The angles topic provides opportunity for students to gain confidence using a protractor to both measure and draw angles. They can develop their spatial awareness.</p> <p>Introduce the uses of percentages with regards to financial calculations and budgeting. They will use both non-calculator and calculator methods. Identify what a percentage represents and also link back to the equivalent fractions, decimals and percentages.</p> <p>Solving linear equations not only develops logic skills but, in most cases, resilience. Develop the idea of representing and unknown and how, in some situations, the unknown can have an exact value.</p>	<p>Understanding of percentages will aid students to better understand those types of numbers in context and make responsible decisions in response.</p> <p>While studying angles around a point, students can look at tessellation and the artwork that can be produced by tessellating shape. Also, that if shapes do not tessellate in 2D, they can be used to make 3D shapes, such as a football, which is made up of 20 hexagons and 12 pentagons.</p> <p>Percentages can be linked to financial situations that students will encounter in the future, such as discounts and interest rates. Terms relating to finance are used in lessons to strengthen this link.</p>
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Half Term 4	<p>Algebra – Formula</p> <p>Algebra – Linear Functions</p> <p>Geometry – Shapes and Construction</p>	<p>Using and manipulating a formula. Substituting into an expression or formula.</p> <p>Plotting coordinates in all four quadrants. Solving geometrical problems on coordinate axes. Plotting vertical and horizontal lines on a coordinate grid. Plotting equations of the form $y = mx + c$.</p> <p>Recognising 2D and 3D shapes and identifying their properties. Understanding rotational symmetry. Drawing and understanding nets of 3D shapes. Drawing and understanding plans and elevations.</p>	<p>Substituting into formulae and expressions allows students to calculate, for example, the time it would take to cook a chicken.</p> <p>Expressions can have a variety of answers depending on the value that you substitute in. Students will develop their understanding of calculating with all types of numbers.</p> <p>Working with 2D and 3D shapes will develop spatial awareness. It provides students an opportunity to develop their construction skills whilst using different equipment (a compass).</p> <p>Plans and elevations have many applications in building/architectural fields as well as in employment where there is a plan of the building that students will need to understand.</p>	<p>Being able to read a plan of a building or space is an important skill to be able to navigate around many public spaces, for example large shopping centres or hospitals.</p> <p>Rotational and line symmetry have links to Islamic Geometric art – a form of tessellating designs that are used to decorate grand and important buildings worldwide.</p> <p>Coordinates can be important outside of the maths classroom – many maps will have a form of a coordinate system to identify/narrow down a location.</p>
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<p>Half Term 5</p>	<p>Geometry – Transformations and Vectors</p> <p>Number – Factors, Powers and Roots</p> <p>Geometry – Measures</p> <p>Probability</p>	<p>Describing movement. Understanding symmetry. Perform and recognise rotations, reflections and translations on a coordinate axes.</p> <p>Recognise and find factors, multiples and primes. Use factor pairs to find factors. Find the HCF and LCM of two or more numbers. Find the product of prime factors in index form of any number. Use prime factors to find HCF or LCM.</p> <p>Perform four operations with money. Understand and use units of time and use a timetable. Reading scales. Choose and use appropriate units. Convert between different metric units.</p> <p>Use a probability scale and associated terminology. Use fractions/decimals/percentages to represent the probability of an event occurring. Use the fact that probability sums to 1.</p>	<p>At this stage we want to be really developing the student’s problem solving skills. This would include looking at how to break down more complex questions.</p> <p>Having confidence to calculate with money will be a vital skill in many jobs, especially entry level jobs students will have.</p> <p>Working with a variety of measures allows students to develop their understanding of the world around them.</p> <p>Probability links to the risk/relative risk involved with an event and students will develop their reasoning when explaining why an event is not always an even chance.</p>	<p>Understanding time and timetables is a vital skills for students to allow them to use many types of public transport as well as generally plan activities knowing their length.</p> <p>Working with the properties of number allows students to see how they can be used to represent situations that they may experience including buying the correct amount of food when the products are sold in different sizes.</p> <p>Students will be able to use probability methods when evaluating the success of an even. For example, when calculating the risk of using a new medicine and the impact.</p>
<p>Half Term 6</p>	<p>Geometry – Volume</p> <p>Algebra – Algebraic Manipulation</p> <p>Ratio and Proportion</p>	<p>Work with the volume of a cuboid and prisms.</p> <p>Continue manipulating algebraic expressions and build upon prior learning.</p> <p>Continue working with ratio and build upon prior learning.</p>	<p>Revisiting prior learning and building upon knowledge will reinforce skills already acquired. This will allow the opportunity to use more complex problem solving techniques.</p> <p>As students become more proficient with their algebraic manipulation skills, we can link this to geometric topics. For example, calculating a missing length having already been given two dimensions and the volume.</p>	<p>Working with volume allows for rates of change to be introduced and students can develop their reasoning when it comes to selecting an appropriate unit of measurement. It also allows students to determine how much liquid is needed to fill a tank.</p>