



Topic Name	Term	Skills Developed	Next link in curriculum
<b>Probability</b>	Autumn	<ul style="list-style-type: none"><li>● Calculating probabilities<ul style="list-style-type: none"><li>○ Combined events</li><li>○ Independent and mutually exclusive events</li></ul></li><li>● Relative frequency</li><li>● Conditional probabilities including tree diagrams</li><li>● Venn diagram notation and finding probabilities using Venn diagrams</li></ul>	<ul style="list-style-type: none"><li>● Solve complex questions related to probability out of context that include algebra or surds.</li></ul>
<b>Multiplicative Reasoning</b>	Autumn	<ul style="list-style-type: none"><li>● Compound interest and depreciation</li><li>● Multiplication and division to calculate problems with compound measures</li><li>● Direct and inverse proportion</li></ul>	<ul style="list-style-type: none"><li>● Link iterative methods to compound growth and decay.</li><li>● Pupils use their understanding to explain their answers in context.</li></ul>
<b>Similarity and Congruence</b>	Autumn	<ul style="list-style-type: none"><li>● Develop their understanding of similarity studied in KS3<ul style="list-style-type: none"><li>○ How to prove congruence?</li><li>○ What makes two shapes similar?</li></ul></li><li>● Understand the relationship between scale factors for length, area and volume</li></ul>	<ul style="list-style-type: none"><li>● Use of scale factors applied to 2D and 3D shapes to solve increasingly challenging problems</li></ul>
<b>Further Trigonometry</b>	Autumn	<ul style="list-style-type: none"><li>● Accuracy and bounds</li><li>● Graphs of trigonometric functions</li><li>● Further trigonometry<ul style="list-style-type: none"><li>○ Area of a triangle using <math>0.5 ab \sin C</math></li><li>○ Sine rule</li><li>○ Cosine rule</li><li>○ Trigonometry without a calculator</li></ul></li></ul>	<ul style="list-style-type: none"><li>● Using upper and lower bounds to complete calculations.</li><li>● Transformations of functions.</li><li>● Use sin cos and tan to calculate angles of any size.</li></ul>



		<ul style="list-style-type: none"> <li>○ 3D trigonometry</li> </ul>	
<b>Collecting data</b>	Spring	<ul style="list-style-type: none"> <li>● Understand what is being asked in a variety of problems               <ul style="list-style-type: none"> <li>○ What and how to collect data</li> <li>○ Understand primary and secondary data</li> <li>○ Consider fairness</li> </ul> </li> <li>● Pupils will learn what a population and sample is               <ul style="list-style-type: none"> <li>○ Sample size will be discussed and how it may affect the reliability of some data</li> </ul> </li> <li>● Plan how best to minimise bias in data collection and the reason for wanting to do so</li> <li>● Understand how to perform Capture-Recapture and see examples of when it is used</li> </ul>	<ul style="list-style-type: none"> <li>● Use these techniques to carry out a survey and collect data.</li> <li>● Be able to explain, in context, how sample size, type of data, bias, etc may have affected a particular set of data that has been collected.</li> </ul>
<b>Cumulative frequency, box plots and histograms</b>	Spring	<ul style="list-style-type: none"> <li>● Pupils will learn how to draw and interpret a number of data presentation techniques               <ul style="list-style-type: none"> <li>○ Cumulative Frequency Diagrams</li> <li>○ Box plots</li> <li>○ Histograms</li> </ul> </li> <li>● Pupils will develop their understanding of averages and measures of spread by calculating these from statistical diagrams and will also be introduced to interquartile range</li> <li>● By the end of this topic pupils will be able to estimate the mean from a histogram. This process is developed from calculating averages from frequency tables.</li> </ul>	<ul style="list-style-type: none"> <li>● Pupils should be able to apply their new learning to questions posed to them out of context; it is particularly important for them to be able to distinguish the difference between each statistical diagram.</li> <li>● A number of these statistical diagrams are studied at A-level as well as required in GCSE examinations.</li> <li>● Further work on measures of spread is seen in year 12 including standard deviation.</li> </ul>



<p><b>Quadratics, expanding more than two brackets, sketching graphs, graphs of circles, cubes and quadratics</b></p>	<p>Spring</p>	<ul style="list-style-type: none"><li>● Understanding of expanding brackets will be developed so that students will be able to multiply together two or three brackets with more than one term in them.</li><li>● Pupils will develop their understanding of solving quadratics using the following methods<ul style="list-style-type: none"><li>○ Factorising (seen before)</li><li>○ Quadratic Formula (seen before)</li><li>○ Completing the square</li></ul></li><li>● An introduction to sketching functions<ul style="list-style-type: none"><li>○ Sketching quadratics and cubics</li><li>○ Finding the turning point of a quadratic by completing the square</li></ul></li><li>● Solve linear and quadratic simultaneous equations graphically. This builds on their understanding of how to achieve the same outcome algebraically.</li><li>● Solve more complex equations by using recursive iteration.</li></ul>	<ul style="list-style-type: none"><li>● Further work on graphs of various functions will be seen throughout the GCSE course.</li><li>● The study of polynomials and other functions is seen at A-level and finding maximum and minimum points on these graphs are found using differentiation at this stage.</li></ul>
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### Summer Half Term 1

During this half term, it has been decided that students will consolidate their learning of topics studied whilst in both lockdowns. Teachers have been directed to spiral back to topics which their students found more challenging whilst learning remotely with the intention of strengthening their depth of knowledge and developing mastery in these areas.

### Summer Half Term 2

Pupils will sit their end of year examinations in mathematics and once marked will go through them writing down model answers for each question to be used as an excellent resource for revision as their GCSE examinations approach. During the remaining weeks after the end of year examinations students will be exposed to questions from a variety of topics chosen by their teacher based on the classes end of year examination performance, for example simultaneous equations may be a topic that needs further practise to secure mastery.

Pupils towards the end of term will take part in the Virtual Maths Quiz activities. This involves work on problem-solving, fractions, algebra and ratio. Activities included are problem-solving activities, card games and polygon bingo and aim to secure a deep understanding of a variety of skills and mathematical techniques that are applicable to the GCSE syllabus.