



**Year 11 Higher Curriculum Overview**

**Subject: Mathematics**

**Year 11 Overview:**

In year 11 students build towards the final exam in Summer. Students are retrieving knowledge and skills learnt prior and begin looking at algebra proof. Topics at A-Level are introduced and some students are encouraged to take an additional GCSE in Further Mathematics. Mock exams take place near Christmas

**Autumn Term**

| Outline of Key Learning  | Unit Code |
|--|-----------|
| <p><b>Constructions, Loci and Bearings</b></p> <ul style="list-style-type: none"> <li>a. Calculate bearings and solve bearings problems, including on scaled maps, and find/mark and measure bearings</li> <li>b. Use the standard ruler and compass constructions to; bisect a given angle, construct a perpendicular to a given line from/at a given point, construct angles of <math>90^\circ</math>, <math>45^\circ</math>, perpendicular bisector of a line segment</li> <li>c. Construct; a region bounded by a circle and an intersecting line, a given distance from a point and a given distance from a line, equal distances from two points or two line segments, regions which may be defined by 'nearer to' or 'greater than'</li> <li>d. Use constructions to solve loci problems including with bearings</li> </ul> | <p>8b</p> |
| <p><b>3D forms and volume</b></p> <ul style="list-style-type: none"> <li>a. Recall and use the formula for the volume of a cuboid or prism made from composite 3D solids using a variety of metric measures</li> <li>b. Convert between metric measures of volume and capacity, e.g. <math>1 \text{ ml} = 1 \text{ cm}^3</math></li> <li>c. Find the volume and surface area of a cylinder and pyramid</li> <li>d. Use the formulae for volume and surface area of spheres and cones;</li> <li>e. Solve problems involving more complex shapes and solids, including segments of circles and frustums of cone</li> </ul>   | <p>7b</p> |

|   |    |
|---|----|
| <p><b>Quadratics and Further Graphs</b></p> <ul style="list-style-type: none"> <li>a. Sketch a graph of a quadratic function, by factorising or by using the formula, identifying roots, y-intercept and turning point by completing the square</li> <li>b. Solve simultaneous equations graphically</li> <li>c. Expand the product of more than two linear expressions</li> <li>d. Solve linear inequalities in two variables graphically;</li> <li>e. Use iteration with simple converging sequences</li> </ul> | 15 |
|---|----|

| Spring Term  |           |
|--|-----------|
| Outline of Key Learning  | Unit Code |
| <p><b>Vectors and geometric proof</b></p> <ul style="list-style-type: none"> <li>a. Represent vectors, combinations of vectors and scalar multiples in the plane pictorially</li> <li>b. Calculate the sum of two vectors, the difference of two vectors and a scalar multiple of a vector using column vectors (including algebraic terms).</li> <li>c. Understand that <math>2\mathbf{a}</math> is parallel to <math>\mathbf{a}</math> and twice its length, and that <math>\mathbf{a}</math> is parallel to <math>-\mathbf{a}</math> in the opposite direction</li> <li>d. Find the length of a vector using Pythagoras' Theorem.</li> <li>e. Solve geometric problems in 2D where vectors are divided in a given ratio</li> </ul>  | 18        |
| <p><b>Reciprocal and Exponential graphs</b></p> <ul style="list-style-type: none"> <li>a. Recognise, sketch and interpret graphs of the reciprocal function with <math>x \neq 0</math></li> <li>b. Recognise, sketch and interpret graphs of exponential functions <math>y = kx</math> for positive values of <math>k</math> and integer values of <math>x</math>;</li> <li>c. Set up, solve and interpret the answers in growth and decay problems</li> <li>d. Estimate area under a quadratic or other graph by dividing it into trapezia</li> <li>e. Interpret the gradient of non-linear graph in curved distance–time and velocity–time graphs calculating speed, distance and acceleration</li> <li>f. Interpret the gradient of a linear or non-linear graph in financial contexts and in real-life contexts</li> </ul> | 19a       |

| <b>Summer Term</b>  |                  |
|---|------------------|
| The examination for this course is in this term. Paper 1, which is non-calculator is around the end of May. Papers 2 and 3 are calculator papers. Students will have completed at least 1 mock as well as several past papers and these highlight areas to improve as well as improving exam technique. |                  |
| <b>Outline of Key Learning</b>  | <b>Unit Code</b> |
| <b>Exam technique &amp; practice</b> <ul style="list-style-type: none"> <li>a. Revisit prior knowledge and apply to exam questions.</li> <li>b. Reflect on areas of weakness and improve them</li> </ul>  | ALL              |