



Year 9

Higher Curriculum Overview

Subject: Mathematics

<b>Year 9 Overview:</b>		
Year 9 is the start of the GCSE course and students build upon the <i>core skills</i> learnt in Years 7 and 8 and extend their knowledge with new topics such as Pythagoras, Inequalities and Data Handling. Reasoning skills are developed to ensure understanding.		
<b>Autumn Term</b>		
<b>Outline of Key Learning</b>	<b>Hegarty Code</b>	<b>Lesson</b>
<b>Indices, powers and roots (1b, 1c)</b> <ul style="list-style-type: none"> <li>a. Find the value of calculations using indices including positive, fractional and negative indices</li> <li>b. Use index laws to simplify and calculate the value of numerical expressions involving multiplication and division of integer powers, fractional and negative powers, and powers of a power</li> <li>c. Find the prime factor decomposition of positive integers – write as a product using index notation</li> <li>d. Find the LCM and HCF of two numbers, by listing, Venn diagrams and using prime factors – include finding LCM and HCF given the prime factorisation of two numbers;</li> <li>e. Solve problems using HCF and LCM, and prime numbers</li> </ul>	103,104 105, 106 29,30,32 27, 31-36	<a href="#">Indices</a> <a href="#">Negative and Fractional indices</a> <a href="#">Factors and Multiples</a> <a href="#">Venn Diagrams</a> <a href="#">HCF / LCM</a>
<b>Pythagoras (5b)</b> <ul style="list-style-type: none"> <li>a. Understand, recall and use Pythagoras' Theorem in 2D</li> <li>b. Calculate the length of a line segment AB given pairs of points</li> </ul>	498,499	<a href="#">Pythagoras</a>
<b>Standard form and Surds (1d)</b> <ul style="list-style-type: none"> <li>a. Add, subtract, multiply and divide numbers in standard form</li> <li>b. Understand surd notation, e.g. calculator gives answer to <math>\sqrt{8}</math> as <math>2\sqrt{2}</math></li> <li>c. Simplify surd expressions involving squares</li> </ul>	125,126 112 115	<a href="#">Standard form</a> <a href="#">Surds</a> <a href="#">Multiplying surds</a>



<p><b>Equations (2a, 2b)</b></p> <ul style="list-style-type: none"><li>a. Solve linear equations, with integer coefficients, in which the unknown appears on either side or on both sides of the equation;</li><li>b. Solve linear equations which contain brackets, including those that have negative signs occurring anywhere in the equation, and those with a negative solution</li><li>c. Derive a formula and set up simple equations from word problems, then solve these equations, interpreting the solution in the context of the problem</li><li>d. Substitute positive and negative numbers into a formula, solve the resulting equation including brackets, powers or standard form</li><li>e. Change the subject of a formula, including cases where the subject is on both sides of the original formula, or involving fractions and small powers of the subject</li><li>f. Use iteration to find approximate solutions to equations, for simple equations in the first instance, then quadratic and cubic equations</li></ul>	<p>176 287 280-286 322</p>	<p><a href="#">Solve simple equations</a> <a href="#">Substitution and rearranging</a> <a href="#">Iteration</a></p>
<p><b>Sequences (2c)</b></p> <ul style="list-style-type: none"><li>a. Use the <math>n^{\text{th}}</math> term of an arithmetic sequence to decide if a given number is a term in the sequence, or find the first term above or below a given number</li><li>b. Identify which terms cannot be in a sequence by finding the <math>n^{\text{th}}</math> term</li><li>c. Continue a quadratic sequence and use the <math>n^{\text{th}}</math> term to generate terms</li><li>d. Find the <math>n^{\text{th}}</math> term of quadratic sequences</li><li>e. Distinguish between arithmetic and geometric sequences</li></ul>	<p>198 247 248 264</p>	<p><a href="#">Linear sequences</a> <a href="#">Quadratic sequences</a></p>



Spring Term		
Outline of Key Learning	Hegarty Code	Lesson
<p><b>Graphs (6a, 6b)</b></p> <ul style="list-style-type: none"> <li>a. Draw and interpret straight-line graphs for real-life situations, conversion graphs, fuel bills, fixed charge and cost per item</li> <li>b. Draw distance–time and velocity–time graphs</li> <li>c. Calculate the length of a line segment given the coordinates of the end points</li> <li>d. Identify and interpret the gradient and y-intercept of a linear graph given by equations</li> <li>e. Find the equation of the line through two given points</li> <li>f. Sketch a graph of a linear function, using the gradient and y-intercept</li> <li>g. Interpret and analyse a straight-line graph and generate equations of lines parallel and perpendicular to the given line</li> </ul>	<p>206, 207, 21</p> <p>876 – 879</p> <p>716, 874, 875</p> <p>201 - 205</p>	<p><a href="#">Real Life Graphs</a></p> <p><a href="#">Straight Line Graphs</a></p> <p><a href="#">Parallel Line Graphs</a></p> <p><a href="#">Perpendicular Line Graphs</a></p>
<p><b>Averages (3a)</b></p> <ul style="list-style-type: none"> <li>a. Design and use two-way tables for discrete and grouped data</li> <li>b. Construct and interpret stem and leaf diagrams (including back-to-back diagrams)</li> <li>c. Find the mode, median, range, as well as the greatest and least values from stem and leaf diagrams, and compare two distributions</li> <li>d. Construct and interpret grouped frequency tables for continuous data</li> </ul>	<p>422 – 424</p> <p>405 - 408</p>	<p><a href="#">Tables and Averages</a></p>
<p><b>Representing Data (3b, 3c)</b></p> <ul style="list-style-type: none"> <li>a. Construct and interpret composite bar charts, dual bar charts, pie charts, frequency polygon and histograms</li> <li>b. Calculate estimated mean from histograms</li> <li>c. Compare the mean and range of two distributions, or median or mode as appropriate</li> <li>d. Draw and interpret scatter graphs</li> <li>e. Distinguish between positive, negative and zero correlation using lines of best fit, and interpret correlation in terms of the problem</li> <li>f. Use the line of best fit make predictions; interpolate and extrapolate apparent trends whilst knowing the dangers of so doing</li> </ul>	<p>424 – 426</p> <p>417, 418</p> <p>427 – 429</p> <p>453, 454</p>	<p><a href="#">Tables, Bar Charts, Pictograms</a></p> <p><a href="#">Pie Charts</a></p> <p><a href="#">Scatter Graphs and Correlation</a></p>

Summer Term		
Outline of Key Learning	Hegarty Code	Lesson
<p><b>Fractions, percentages (4a, 4b)</b></p> <ul style="list-style-type: none"> <li>a. Express a given number as a fraction of another</li> <li>b. Convert a fraction to a decimal to make a calculation easier</li> <li>c. Add, subtract, multiply and divide fractions including mixed numbers</li> <li>d. By writing the denominator in terms of its prime factors, decide whether fractions can be converted to recurring or terminating decimals;</li> <li>e. Convert a fraction to a recurring decimal and vice versa</li> <li>f. Find the reciprocal of an integer, decimal or fraction</li> <li>g. Find a percentage of a quantity using a multiplier</li> <li>h. Use a multiplier to increase or decrease by a percentage</li> <li>i. Compare two quantities using percentages, including a range of calculations and contexts such as those involving time or money</li> </ul>	<p>62 73-74 65-69</p> <p>53-54 71 89 87-88,90</p>	<p><a href="#">FDP Equivalents</a></p> <p><a href="#">+ / - Fractions</a></p> <p><a href="#">Multiply/Divide Fractions</a></p> <p><a href="#">Percentages</a></p> <p><a href="#">Reverse and % change</a></p>
<p><b>Ratio &amp; Proportion (4c)</b></p> <ul style="list-style-type: none"> <li>a. Divide a given quantity into two or more parts in a given part : part or part : whole ratio</li> <li>b. Use a ratio to find one quantity when the other is known</li> <li>c. Write a ratio as a linear function</li> <li>d. Convert between currencies</li> </ul>	<p>332-334</p> <p>331 707-708</p>	<p><a href="#">Ratio 1</a></p>
<p><b>Angles in polygons (5a)</b></p> <ul style="list-style-type: none"> <li>a. Classify quadrilaterals by their geometric properties and distinguish between scalene, isosceles and equilateral triangles</li> <li>b. Calculate and use the sums of the interior angles of polygons; use the sum of angles in a triangle and use the angle sum in any polygon to derive the properties of regular polygons</li> <li>c. Find the size of each interior angle, or the size of each exterior angle, or the number of sides of a regular polygon, and use the sum of angles of irregular polygons</li> </ul>	<p>823-826</p> <p>561-562</p> <p>563-564</p>	<p><a href="#">Polygons 2</a></p>