

# Subject: Mathematics – Advent Term

	Progress objective 1 Number	Progress objective 2: Algebra	Progress objective 3: Geometry	Progress objective 4: Ration and Proportion
<b>Pathway 1</b>	<ul style="list-style-type: none"> <li>The prime factor decomposition of a number. (when you know the PFD of 24 state it for 48)</li> <li>Use PFD to find the HCF and LCM of a number.</li> <li>Workout the laws of indices for positive powers. ( extend to negative powers and fractional powers)</li> <li>Show that any number to the power of zero is 1.</li> <li>Use laws of indices for <math>x</math> and <math>\div</math>.</li> <li>Use and understand powers of 10.</li> <li>Use the prefixes associated with powers of 10.</li> <li>Understand the effect of <math>x</math> and <math>\div</math> by any integer power of 10.</li> <li>Calculate with powers.</li> <li>Round to a number of significant figures. (and estimate answers using SF)</li> </ul>	<ul style="list-style-type: none"> <li>Simplify expressions involving powers and brackets.</li> <li>Understand the meaning of an identity.</li> <li>Use the index laws in algebraic calculations and expressions.</li> <li>Simplify expressions with powers.</li> <li>Write and simplify expressions involving brackets and powers.</li> <li>Factorise an algebraic expression.</li> <li>Substitute integers into expressions.</li> <li>Construct and solve equations.</li> </ul>	<ul style="list-style-type: none"> <li>Use 2D representations of 3D solids.</li> <li>Sketch nets of 3D solids.</li> <li>Calculate the surface area of prisms.</li> <li>Calculate the volume of right prisms.</li> <li>Name the different parts of a circle.</li> <li>Calculate the circumference,</li> <li>Calculate the diameter and radius when you know the circumference. (use parts of a circle also)</li> <li>Calculate the area of a circle.</li> <li>Calculate the radius or diameter when you know the area. (Use parts of a circle also)</li> <li>Calculate the volume and surface area of a cylinder.</li> <li>Use Pythagoras Theorem in right-angled triangles. (Extend to 3D Pythagoras)</li> </ul>	<ul style="list-style-type: none"> <li>Recognise when values are in direct proportion. (look at indirect proportion)</li> <li>Plot graphs and read values to solve problems.</li> <li>Interpret graphs from different sources.</li> <li>Understand financial graphs.</li> <li>Draw and interpret distance-time graphs.</li> <li>Use DT graphs to solve problems.</li> <li>Interpret graphs that are curved.</li> <li>Interpret real-life graphs.</li> <li>Understand when graphs are misleading.</li> </ul>
	Progress objective 1 Number	Progress objective 2: Algebra	Progress objective 3: Geometry	Progress objective 5: Statistics and Probability
<b>Pathway 2</b>	<ul style="list-style-type: none"> <li>Use written methods to <math>+</math> and <math>-</math> with decimals.</li> <li>Use mental calculation.</li> <li>Calculate with money.</li> <li>Estimate answers to calculations.</li> <li><math>+</math><math>\times</math><math>\div</math> positive and negative numbers.</li> <li>Calculate using squares, cubes and their roots.</li> <li>Use mental methods to calculate combinations of powers, roots and brackets.</li> <li>Substitute numbers into formulae involving powers, roots and brackets.</li> <li>Use index notation.</li> <li>Write a number as a product of its prime factors.</li> <li>Use PFD to find the HCF and LCM of a number.</li> </ul>	<ul style="list-style-type: none"> <li>Understand and simplify algebraic powers.</li> <li>Substitute values into formula involving powers.</li> <li>Expand brackets.</li> <li>Make and simplify algebraic expressions.</li> <li>Factorise expressions.</li> <li>Find the inverse of a simple function.</li> <li>Solve simple equations using function machines.</li> <li>Solve real-life problems using equations.</li> <li>Solve two-step equations using function machines.</li> <li>Solve real-life problems using equations.</li> <li>Solve equations using the balancing method.</li> </ul>	<ul style="list-style-type: none"> <li>Derive and use the formula for the area of a triangle.</li> <li>Calculate the area of compound shapes made from rectangles and triangles.</li> <li>Derive and use the formula for the area of a parallelogram.</li> <li>Use the formula for the area of a trapezium.</li> <li>Calculate the volume of cubes and cuboids.</li> <li>Calculate the volume of shapes made from cuboids.</li> <li>Solve volume problems.</li> <li>Sketch nets of 3D solids</li> <li>Use 2D representations of 3D solids.</li> <li>Calculate the surface area of cubes and cuboids.</li> <li>Solve problems in everyday contexts involving measures.</li> <li>Converts between different measures for area, volume and capacity.</li> <li>Use tonnes and hectares.</li> <li>Correctly enter metric measures on a calculator.</li> <li>Know rough metric equivalents of imperial measures.</li> </ul>	<ul style="list-style-type: none"> <li>Interpret pie charts.</li> <li>Draw pie charts.</li> <li>Calculate the mean from a frequency table.</li> <li>Design and use two-way tables.</li> <li>Design and use tables for grouped data.</li> <li>Draw stem and leaf diagrams for data.</li> <li>Interpret stem and leaf diagrams.</li> <li>Compare two sets of data using statistics or the shape of the graph.</li> <li>Construct line graphs.</li> <li>Choose the most appropriate average to use.</li> <li>Draw a scatter graph.</li> <li>Draw a line of best fit on a scattergraph.</li> <li>Describe types of correlation.</li> <li>Interpret graphs and charts.</li> <li>Explain why a graph or chart could be misleading.</li> </ul>

## KS3 Assessment – Year 8 Progress Grid

	Progress objective 1: Number	Progress objective 2: Algebra	Progress objective 3: Geometry	Progress objective 5: Statistics and Probability
<b>Pathway 3</b>	<ul style="list-style-type: none"> <li>Add and subtract larger numbers.</li> <li>Multiply larger numbers.</li> <li>Use brackets.</li> <li>Add and Subtract with negative numbers.</li> <li>x and <math>\div</math> negative numbers.</li> <li>Work with ratios.</li> <li>Find equivalent ratios.</li> <li>Solve simple word problems involving ratio.</li> <li>Understand the relationship between ration and proportion.</li> <li>Use proportion to solve simple problems.</li> </ul>	<ul style="list-style-type: none"> <li>Simplify expressions by collecting like terms.</li> <li>Find outputs and inputs of function machines.</li> <li>Construct functions.</li> <li>Solve simple equations and check the solution is correct.</li> <li>Understand the difference between an expression and an equation, and identify the unknown in an equation.</li> <li>Use brackets with numbers and letters.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise and name 3D solids.</li> <li>Count faces, edges and vertices.</li> <li>Deduce properties of 3D solids from 2D representations.</li> <li>Identify nets of 3D solids including cubes and cuboids.</li> <li>Draw nets of 3D solids using a ruler and protractor.</li> <li>Calculate the surface area of cubes and cuboids.</li> <li>Find the volume of a cube or cuboid by counting cubes.</li> <li>Know the formula for calculating the volume of a cube or cuboid.</li> <li>Solve problems involving units of length, area and capacity.</li> <li>Convert between <math>\text{cm}^3</math> and litres.</li> </ul>	<ul style="list-style-type: none"> <li>Design a data collection sheet.</li> <li>Group data into equal class intervals.</li> <li>Interpret complex bar charts.</li> <li>Draw bar charts for more than one set of data.</li> <li>Interpret pie charts.</li> </ul>