

Term	Theme	Intended Knowledge Acquisition
Autumn Term	Understanding Multiplicative Relationships (Ratio & Fractions)	<p>By the end of this module, students should ....</p> <ul style="list-style-type: none"> <li>• Appreciate that any two numbers can be connected via a multiplicative relationship</li> <li>• Understand that a multiplicative relationship can be expressed as a ratio and as a fraction</li> <li>• Be able to calculate the multiplier for any given two numbers</li> <li>• Appreciate that there are an infinite number of pairs of numbers for any given multiplicative relationship (equivalence)</li> <li>• Understand and use the language and notation of ratio and use a ratio table to represent a multiplicative relationship and connect to other known relationships</li> <li>• Find a fraction of a given amount</li> <li>• Given a fraction and the result, find the original amount</li> <li>• Express one number as a fraction of another</li> <li>• Be able to divide a quantity into a given ratio</li> <li>• Be able to determine the whole, given one part and the ratio</li> <li>• Be able to determine one part, given the other part and the ratio</li> <li>• Use ratio to describe rates (exchange rates, conversions etc)</li> </ul>
	Estimation & Rounding	<p>By the end of this module, students should ....</p> <ul style="list-style-type: none"> <li>• Round numbers to three decimal places</li> <li>• Round numbers to any number of decimal places</li> <li>• Understand the concept of significant figures</li> <li>• Round integers to a required number of significant figures</li> <li>• Round decimals to a required number of significant figures</li> <li>• Understand what is meant by a sensible degree of accuracy</li> <li>• Estimate numerical calculations</li> <li>• Estimate &amp; check if solutions to problems are of the correct magnitude</li> <li>• Determine whether calculations using rounding will give an underestimate or an overestimate</li> <li>• Understand the impact of rounding errors when using a calculator</li> <li>• Calculate possible errors expressed using inequality notation <math>a &lt; x \leq b</math></li> </ul>
	Solving Linear Equations	<p>By the end of this module, students should ....</p> <ul style="list-style-type: none"> <li>• Recognise that there are many different types of equations of which linear is one type</li> <li>• Understand that in an equation the two sides of the 'equals' sign balance</li> <li>• Understand that a solution is a value that makes the two sides of an equation balance</li> <li>• Understand that a family of linear equations can all have the same solution</li> <li>• Solve a linear equation requiring a single additive step or a single multiplicative step</li> <li>• Understand that an equation needs to be in a format to be 'ready' to be solved, through collecting like terms</li> <li>• Recognise that equations with unknowns on both sides of the equation can be manipulated so that the unknowns are on one side</li> <li>• Solve complex linear equations, including those involving reciprocals</li> <li>• Appreciate the significance of the bracket in an equation</li> <li>• Recognise that there is more than one way to remove a bracket when solving an equation</li> <li>• Solve equations involving brackets when simplification is necessary first</li> </ul>
Spring Term	Sequences	<p>By the end of this module, students should ....</p> <ul style="list-style-type: none"> <li>• Appreciate that a sequence is a succession of terms formed according to a rule</li> <li>• Understand that a sequence can be generated and described using term-to-term approaches</li> <li>• Understand that a sequence can be generated and described by a position-to-term rule</li> <li>• Understand the features of an arithmetic sequence and be able to recognise one</li> <li>• Understand that any term in an arithmetic sequence can be expressed in terms of its position in the sequence (<math>n^{\text{th}}</math> term)</li> <li>• Understand that the <math>n^{\text{th}}</math> term allows for the calculation of any term</li> <li>• Determine whether a number is a term of a given sequence</li> </ul>
	Linear Graphs	<p>By the end of this module, students should ....</p> <ul style="list-style-type: none"> <li>• Know that a set of coordinates, constructed according to a mathematical rule, can be represented algebraically and graphically</li> <li>• Understand that a graphical representation shows all of the points (within a range) that satisfy a relationship</li> <li>• Recognise that linear relationships have particular algebraic and graphical features as a result of the constant rate of change</li> <li>• Understand the two key elements to any linear relationship: rate of change and intercept</li> <li>• Know that writing linear equations in the form <math>y = mx + c</math> helps to reveal the structure</li> <li>• Solve a range of problems involving graphical and algebraic aspects of linear relationships</li> </ul>
	Percentages & Proportionality	<p>By the end of this module, students should ....</p> <ul style="list-style-type: none"> <li>• Describe one number as a percentage of another</li> <li>• Find a percentage of a quantity using a multiplier</li> <li>• Calculate percentage changes (increases &amp; decreases)</li> <li>• Calculate the original value, given the final value after a stated percentage increase/decrease</li> <li>• Find the percentage increase or decrease, given start and finish quantities</li> <li>• Understand the connection between multiplicative relationships and direct proportion</li> <li>• Recognise direct proportion and use in a range of contexts, including compound measures</li> <li>• Recognise and use inverse proportionality in a range of contexts</li> </ul>

Summer Term	Statistics	<p>By the end of this module, students should ....</p> <ul style="list-style-type: none"> <li>• Understand what the mean, median, mode &amp; range is measuring, how they are measuring it and calculate them from data presented in a range of different ways</li> <li>• Construct bar charts, pie charts, pictograms &amp; scatter graphs from data presented in a number of different ways</li> <li>• Understand that the different measures of central tendency offer a summary of a set of data</li> <li>• Understand how certain statistical measures may change as a result of changes in the data</li> <li>• Understand range as a measure of spread, including a consideration of outliers</li> <li>• Understand that the different statistical representations offer different insights into a set of data</li> <li>• Use the different measures of central tendency and spread to compare two sets of data</li> <li>• Recognise relationships between bivariate data represented on a scatter graph</li> <li>• Given a statistical problem, choose what data needs to be analysed, choose appropriate statistical measures &amp; representations to explore that problem.</li> <li>• Given a statistical problem, be able to effectively summarise and communicate conclusions</li> </ul>
	Perimeter, Area & Volume	<p>By the end of this module, students should ....</p> <ul style="list-style-type: none"> <li>• Recognise that there is a constant multiplicative relationship (<math>\pi</math>) between the diameter and circumference of a circle</li> <li>• Use the relationship <math>C = \pi d</math> to calculate unknown lengths in contexts involving the circumference of circles</li> <li>• Understand the derivation of, and use the formula for, the area of a circle</li> <li>• Solve area problems of composite shapes involving whole and/or part circles, including finding the radius or diameter given the area</li> <li>• Understand the concept of surface area and find the surface area of 3D shapes in an efficient way</li> <li>• Be aware that all prisms have two congruent polygonal parallel faces (bases) with parallelogram faces joining the corresponding vertices of the bases</li> <li>• Use the constant cross-sectional area property of prisms and cylinders to determine their volume</li> </ul>
	Polygons & Angles	<p>By the end of this module, students should ....</p> <ul style="list-style-type: none"> <li>• Understand that a pair of parallel lines transversed by a straight line produces sets of equal and supplementary angles</li> <li>• Know and understand proofs that in a triangle, the sum of interior angles is 180 degrees</li> <li>• Know and understand proofs for finding the interior and exterior angle of any regular polygon</li> <li>• Solve problems that require use of a combination of angle facts to identify values of missing angles, providing explanations of reasoning and logic used</li> </ul>