

## YEAR 8 SCHEME OF WORK - DEVELOPING

Autumn Term 1	<a href="#"><u>Number Properties and Calculations</u></a>	Spring Term 1	<a href="#"><u>Decimal calculations</u></a>	Summer Term 1	<a href="#"><u>Sequences</u></a>
	<a href="#"><u>Shapes and measures in 3D</u></a>		<a href="#"><u>Angles</u></a>		<a href="#"><u>Fractions and percentages</u></a>
Half Term: Assessment		Half Term: Assessment		Half Term: Assessment	
Autumn Term 2	<a href="#"><u>Statistics</u></a>	Spring Term 2	<a href="#"><u>Number properties</u></a>	Summer Term 2	<a href="#"><u>Probability</u></a>
	<a href="#"><u>Expressions and equations</u></a>				End of Term Assessment
End of Term: Assessment		End of Term: Assessment		End of Year: Assessment	

Year 8 Support Term: Autumn 1	Unit Title: Number properties and calculations	Duration: 12 hrs.
<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• understand and use place value for integers</li> <li>• use the four operations, including formal written methods, with positive and negative integers</li> <li>• use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals</li> <li>• use ratio notation</li> <li>• reduce a ratio to simplest form</li> <li>• divide a given quantity into two parts in a given part:part ratio</li> <li>• express the division of a quantity into two parts as a ratio</li> <li>• understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction</li> </ul>	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Add and subtract integers with varying numbers of significant figures</li> <li>• Understand how to use brackets in simple calculations</li> <li>• Extend written methods to TU x TU and HTU x TU</li> <li>• Add and subtract negative integers from positive and negative integers</li> <li>• Multiply by zero</li> <li>• Multiply and divide negative integers by a positive number</li> <li>• Use ratio notation</li> <li>• Reduce a ratio to its simplest form</li> <li>• Reduce a three part ratio to its simplest form by cancelling</li> <li>• Find equivalent ratios</li> <li>• Solve simple problems using ratio expressed in words and in ratio notation</li> <li>• Recognise the links between ratio and fractional notation</li> <li>• Use direct proportion in simple contexts</li> <li>• Use the unitary method to solve simple word problems involving ratio</li> </ul>	

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Year 8 Support	Unit Title: Shapes and measures in 3D	Duration: 11 hrs.
<p><b>Term: Autumn 1</b></p> <p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• derive and apply formulae to calculate and solve problems involving volume of cuboids (including cubes)</li> </ul>	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Know and use names of 3D shapes</li> <li>• Identify 2D representations of 3D shapes</li> <li>• Identify and count faces, edges, vertices</li> <li>• Identify a prism and know it has a constant cross section</li> <li>• Know and use geometric properties of cuboids and shapes made from cuboids</li> <li>• Deduce properties of 3D shapes from 2D representations, including nets, 3D sketches and isometric drawings</li> <li>• Identify nets of closed cubes and cuboids</li> <li>• Identify nets of 3D shapes – regular and irregular polyhedra</li> <li>• Use a ruler and compass to construct simple nets of 3D shapes</li> <li>• Calculate the surface area of cubes</li> <li>• Use nets to calculate the surface area of simple cuboids</li> <li>• Find the volume of a cube and cuboid by counting cubes</li> <li>• Know the formulae for the volume of cube and a cuboid</li> <li>• Solve simple problems involving units of measurement in the context of length, area and capacity</li> <li>• Convert <math>\text{cm}^3</math> to litres</li> </ul>	

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<b>Year 8 Support</b> <b>Term: Autumn 2</b>	<b>Unit Title: Statistics</b>	<b>Duration: 10 hrs.</b>
<b>Objectives:</b> <ul style="list-style-type: none"> <li>• describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete data</li> <li>• construct and interpret frequency tables</li> <li>• construct and interpret bar charts</li> <li>• construct and interpret pie charts</li> </ul>	<b>Notes:</b> <ul style="list-style-type: none"> <li>• Group data, where appropriate in equal class intervals</li> <li>• Use experimentation to complete a data collection sheet, e.g. throwing a dice or data-logging</li> <li>• Use questionnaire responses to complete a data collection sheet</li> <li>• Interpret data from compound and comparative bar charts</li> <li>• Construct a frequency table for grouped discrete data and draw a graph</li> <li>• Construct compound bar graphs</li> <li>• Interpret simple pie charts</li> </ul>	

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Year 8 Support Term: Autumn 2	Unit Title: Expressions and equations	Duration: 10 hrs.
<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• recognise and use relationships between operations including inverse operations</li> <li>• use and interpret algebraic notation: brackets</li> <li>• substitute numerical values into formulae and expressions, including scientific formulae</li> <li>• understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors</li> <li>• simplify and manipulate algebraic expressions to maintain equivalence: collecting like terms</li> <li>• simplify and manipulate algebraic expressions to maintain equivalence: multiplying a single term over a bracket</li> </ul>	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Use arithmetic operations with algebra</li> <li>• Simplify more complex linear algebraic expressions by collecting like terms, e.g. <math>x + 7 + 3x</math>, <math>2b - 3a + 6b</math></li> <li>• Find outputs and inputs of simple functions expressed in words or symbols using inverse operations</li> <li>• Construct functions (completing a number machine)</li> <li>• Understand the difference between an expression and an equation and the meaning of the key vocabulary 'term'</li> <li>• Understand and identify the unknowns in an equation</li> <li>• Solve simple linear equations with integer coefficients, of the form <math>ax = b</math> or <math>x + / - b = c</math>, e.g. <math>2x = 18</math>, <math>x + 7 = 12</math> or <math>x - 3 = 15</math></li> <li>• Substitute solution back into equation to check it is correct</li> <li>• Use distributive law with brackets, with numbers</li> <li>• Know that expressions can be written in more than one way, e.g. <math>2 \times 3 + 2 \times 7 = 2(3 + 7)</math></li> <li>• Begin to multiply a positive integer over a bracket containing linear terms, e.g. <math>4(x + 3)</math></li> </ul>	

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Year 8 Support Term: Spring 1	Unit Title: Decimal calculations	Duration: 10 hrs.
<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• understand and use place value for decimals</li> <li>• order positive and negative integers</li> <li>• order decimals and fractions</li> <li>• use the symbols =, ≠, &lt;, &gt;, ≤, ≥</li> <li>• use the four operations, including formal written methods, with positive and negative decimals</li> </ul>	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Be able to add decimals with up to two decimal places, but with varying numbers of decimal places</li> <li>• Be able to add more than two decimals with up to two decimal places, but with varying numbers of decimal places</li> <li>• Be able to subtract integers and decimals with up to two decimal places, but with varying numbers of decimal places</li> <li>• Be able to add and subtract more than two decimals with up to two decimal places, but with varying numbers of decimal places and using a mixture of operations within the calculation.</li> <li>• Extend the possible decimals that can be used in mental calculations by using halving and doubling strategies.</li> <li>• Use mental strategies for multiplication – partitioning two 2 digit numbers where one number includes a decimal (both numbers have two significant figures)</li> <li>• Multiply decimals with two places by single-digit whole numbers</li> <li>• Multiply integers and decimals including by decimals such as 0.6 and 0.06, 0.t x 0.t or 0.t x 0.0h, 0.0h x 0.t and 0.0h x 0.0h</li> <li>• Mentally be able to calculate the squares of numbers less than 16 multiplied by a multiple of ten, e.g. 0.2, 300, 0.400</li> <li>• Solve problems involving decimal numbers</li> <li>• Choose the correct operation to use when solving decimal problems</li> <li>• Round and order decimals</li> <li>• Divide a quantity into two parts in a given ratio (whole numbers), where the answer is a decimal</li> </ul>	

Year 8 Support	Unit Title: Angles	Duration: 10 hrs.
<p style="text-align: right;"><b>Term: Spring 1</b></p> <p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• draw and measure line segments and angles in geometric figures</li> <li>• use the standard conventions for labelling the sides and angles of triangle ABC</li> <li>• apply the properties of angles at a point</li> <li>• apply the properties angles at a point on a straight line</li> <li>• apply the properties vertically opposite angles</li> <li>• derive and use the sum of angles in a triangle</li> </ul>	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Use a protractor to measure reflex angles to the nearest degree</li> <li>• Use correct notation for labelling triangles</li> <li>• Use a protractor to draw reflex angles to the nearest degree</li> <li>• Calculate angles around a point</li> <li>• Use a protractor to draw obtuse angles to the nearest degree</li> <li>• Use a protractor to draw reflex angles to nearest degree</li> <li>• Identify interior and exterior angles in a shape</li> <li>• Know the sum of angles in a triangle</li> <li>• Calculate angles in a triangle</li> <li>• Recognise and use vertically opposite angles</li> <li>• Use a ruler and protractor to construct a triangle given two sides and the included angle (SAS)</li> <li>• Use a ruler and protractor to construct a triangle given two angles and the included side (ASA)</li> <li>• Use ruler and protractor to construct simple nets of 3D shapes, using squares, rectangles and triangles, e.g. square-based pyramid, triangular prism</li> <li>• Investigate triangles using Pythagoras' theorem</li> </ul>	

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Year 8 Support Term: Spring 2	Unit Title: Number properties	Duration: 10 hrs.
<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals</li> <li>• use integer powers and associated real roots (square, cube and higher)</li> <li>• recognise powers of 2, 3, 4, 5</li> <li>• use the concepts and vocabulary of prime numbers</li> <li>• use the concepts and vocabulary of factors (or divisors)</li> <li>• use the concepts and vocabulary of multiples</li> <li>• use the concepts and vocabulary of common factors</li> <li>• use the concepts and vocabulary of common multiples</li> <li>• use the concepts and vocabulary of highest common factor</li> <li>• use the concepts and vocabulary of lowest common multiple</li> <li>• use the concepts and vocabulary of prime factorisation</li> <li>• use product notation and the unique factorisation property</li> <li>• use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals</li> <li>• use integer powers and associated real roots (square, cube and higher)</li> <li>• recognise powers of 2, 3, 4, 5</li> <li>• use a calculator and other technologies to calculate results accurately and then interpret them appropriately</li> </ul>	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Know square numbers beyond 10 x 10</li> <li>• Find corresponding roots</li> <li>• Use the square root and change sign keys on a calculator</li> <li>• Extend mental calculations to squares and square roots</li> <li>• Use a calculator for cubes and cube roots</li> <li>• Use the order of operations with brackets including in more complex calculations</li> <li>• Use index notation for squares and cubes and for positive integer powers of 10</li> <li>• Use index notation for small integer powers, e.g. <math>3 \times 2 \times 2 \times 2 = 3 \times 2^3</math></li> <li>• Find LCM and HCF from lists of factors or multiples</li> <li>• Find the prime factor decomposition of a number less than 100</li> <li>• Find the HCF or LCM of 2 numbers less than 100 (using prime factor decomposition)</li> <li>• Know all the squares of numbers less than 16 and know the square root given the square number.</li> <li>• Check by an inverse operation (questions other than four rules, e.g. square roots checked with squaring)</li> <li>• Work with calculations where the brackets are squared or square rooted</li> <li>• Estimate square roots of non-square numbers less than 100, e.g. give integers that the roots lie between</li> </ul>	

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Year 8 Support	Unit Title: Sequences	Duration: 11 hrs.
<p style="text-align: right;"><b>Term: Summer 1</b></p> <p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• generate terms of a sequence from a term-to-term rule</li> <li>• generate terms of a sequence from a position-to-term</li> <li>• recognise arithmetic sequences</li> <li>• find the <math>n</math>th term</li> <li>• recognise geometric sequences and appreciate other sequences that arise</li> </ul>	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Generate terms of sequences arising from practical contexts</li> <li>• Generate terms of simple sequences using term-to-term rules like <math>+3</math> or <math>-2</math></li> <li>• Use the words finite, infinite, ascending and descending to describe sequences</li> <li>• Understand the infinite nature of a set of integers</li> <li>• Generate terms of a more complex sequence using term-to-term rules like <math>\times 2</math> then <math>+1</math> or <math>-1</math> then <math>\times 2</math></li> <li>• Generate terms of linear sequences using term-to-term with positive or negative integers</li> <li>• Know that an arithmetic sequence is generated by a starting number <math>a</math>, then adding a constant number, <math>d</math></li> <li>• Generate and describe simple integer sequences, square and triangular numbers</li> <li>• Recognise triangular numbers</li> <li>• Generate and describe integer sequences such as powers of 2 and growing rectangles</li> <li>• Recognise geometric sequences and appreciate other sequences that arise</li> <li>• Find a term given its position in the sequences like tenth number in <math>4x</math> table is 40 (one operation on <math>n</math>)</li> <li>• Find a term of a practical sequence given its position in the sequence</li> <li>• Generate terms of linear sequences using position-to-term with positive integers</li> <li>• Begin to use linear expressions to describe the <math>n</math>th term in a one-step arithmetic sequence</li> </ul>	

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Year 8 Support Term: Summer 1	Unit Title: Fractions and percentages	Duration: 11 hrs.
<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• use the four operations, including formal written methods, with positive and negative fractions</li> <li>• interpret percentages and percentage changes as a fraction or a decimal</li> <li>• express one quantity as a percentage of another</li> <li>• interpret fractions and percentages as operators</li> </ul>	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Use a diagram to compare two or more simple fractions with different denominators, and not unit fractions</li> <li>• Calculate fractions of quantities and measurements</li> <li>• Identify equivalent fractions.</li> <li>• Begin to add and subtract simple fractions and those with simple common denominators</li> <li>• Extend the possible fractions that can be used in mental calculations by using halving and doubling strategies.</li> <li>• Add fractions by writing with a common denominator, where the denominators are 12 or less, where the answer is less than 1</li> <li>• Understand that when two positive fractions are added the answer is larger than either of the original two fractions</li> <li>• Simplify fractions by cancelling all common factors</li> <li>• Express one number as a fraction of another (halves, quarters, thirds)</li> <li>• Multiply a fraction by an integer</li> <li>• Subtract fractions by writing with a common denominator, where the denominators are less than 12 and the first fraction is larger than the second</li> <li>• Extend mental methods of calculation to include percentages</li> <li>• Calculate simple percentages</li> <li>• Use percentages to compare simple proportions</li> <li>• Express one given number as a percentage of another</li> </ul>	

Year 8 Support Term: Summer 2	Unit Title: Probability	Duration: 10 hrs.
<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes</li> <li>• use appropriate language of probability</li> <li>• use the 0-1 probability scale</li> <li>• understand that probabilities of all possible outcomes sum to 1</li> </ul>	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Use the vocabulary of probability</li> <li>• Use a probability scale with words</li> <li>• Understand and use the probability scale from 0 to 1</li> <li>• Identify all possible mutually exclusive outcomes of a single event</li> <li>• Find and justify probabilities based on equally likely outcomes in simple contexts</li> <li>• Know that if probability of event is <math>p</math> then probability of event not occurring is <math>1 - p</math></li> <li>• Identify all mutually exclusive outcomes for two successive events with two outcomes in each event</li> <li>• Estimate probabilities based on given experimental data</li> <li>• When interpreting results of an experiment, use vocabulary of probability</li> <li>• Use experimentation to complete a data collection sheet e.g. throwing a dice or data-logging</li> <li>• Use the language of probability to compare the choice of <math>x/a</math> with <math>y/a</math></li> </ul>	

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