



# SUNNYDOWN SCHOOL

## MATHEMATICS CURRICULUM PLAN

<b>Subject</b>	<b>Mathematics</b>	<b>Year group</b>	<b>7</b>
<b>Subject Intent</b>	<p>In Year 7 we aim to develop a calm classroom environment that allows for students to have the time and space to think clearly. We encourage open and honest reflections/conversations about how the students feel about the work they are asked to complete. Mistakes are encouraged and although we understand that some pupils will find making mistakes difficult, we support them to understand that this is part of the learning process (Growth mind-set). We give students the opportunity to develop their understanding of the basic concepts studied in KS2 while developing their reasoning skills by applying these concepts to new and challenging contexts. We aim to deliver engaging and relevant learning experiences for all students to foster their enjoyment and understanding of Maths.</p>		

<b>Term</b>	<b>Topic</b>	<b>Core learning</b>	<b>Key concepts</b>	<b>Sequencing</b>
<b>Autumn 1</b>	<b>Basic operations</b>	<p>Use addition and subtraction formal methods including adding lists of numbers.            Multiply using formal written methods applied to positive integers.            Divide using formal written method applied to positive integers            Use addition and subtraction formal methods including adding lists and decimals.            Multiply and divide using formal written methods applied to positive integers with carrying.</p>	<ul style="list-style-type: none"> <li>• Add, plus, total, sum of</li> <li>• Subtract, take away, minus, difference</li> <li>• Multiply, times, product</li> <li>• Divide, share</li> </ul>	<p><i>Building on</i> work completed at KS2. Pupils should be able to:</p> <ul style="list-style-type: none"> <li>• Order and compare numbers to at least 1 000 000 and determine the value of each digit count forwards or backwards in steps of powers of 10.</li> <li>• Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</li> </ul> <p><i>Building towards</i>            Understand and use place value for decimals, measures and integers of any size order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers;</p>

				use the symbols =, ≠, <, >, ≤, ≥ use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property
<b>Autumn 2</b>	<b>Fractions</b>	<p>Through this topic students will develop the ability to:</p> <p>Recognise a fraction and how to write it down.</p> <p>Shade a shape to show/represent a fraction.</p> <p>Recognise what the numbers in a fraction represent.</p> <p>Recognise an equivalent fraction.</p> <p>Simplify fractions</p> <p>Add and subtract fractions.</p> <p>Multiply and divide fractions.</p> <p>Change a fraction into a decimal.</p> <p>Order fractions.</p> <p>Work out factors of numbers.</p> <p>See the connections between fractions, decimals and percentages.</p>	<ul style="list-style-type: none"> <li>● Fractions</li> <li>● Whole</li> <li>● Half</li> <li>● Quarter</li> <li>● Third</li> <li>● Fifth</li> <li>● Top heavy</li> <li>● Numerator</li> <li>● Denominator</li> <li>● Equivalent</li> <li>● Simplify</li> <li>● Factors</li> <li>● Decimal</li> <li>● Percentage</li> </ul>	<p><i>Building on</i> work completed at KS2. Pupils should be able to:</p> <ul style="list-style-type: none"> <li>● recognise basic fractions of amounts such as half, quarter and third.</li> <li>● Pupils should be able to count up in and divide quantities by 10.</li> <li>● Add small fractions with the same denominator.</li> <li>● Use common factors to simplify fractions</li> </ul> <p><i>Building towards</i> pupils moving freely between different numerical representations such as fractions, decimals and percentages.</p>
<b>Autumn 2</b>	<b>Decimals</b>	<p>Through this topic students will develop the ability to:</p> <p>Understand the place value of digits in whole numbers.</p> <p>Multiplying numbers by 10, 100 and 1000 using a place value chart.</p> <p>Writing decimal numbers using words.</p> <p>Ordering decimal numbers.</p> <p>Complete number patterns containing decimal numbers.</p> <p>The four operations and decimals.</p>	<ul style="list-style-type: none"> <li>● Place value</li> <li>● Whole numbers</li> <li>● Decimal point</li> <li>● Tenths</li> <li>● Hundredths</li> <li>● Thousandths</li> <li>● Accurate</li> <li>● More than/ less than</li> </ul>	<p><i>Building on</i> work completed at KS2. Pupils should be able to:</p> <ul style="list-style-type: none"> <li>● Understand place value to three decimal places.</li> <li>● Multiply and divide numbers by 10, 100 &amp; 1000.</li> <li>● Recognise the equivalent fractions of basic decimals such as half, quarter and tenth.</li> </ul> <p><i>Building towards</i> pupils moving freely</p>

		Round decimals to a specific number of places. Round amounts of money.	<ul style="list-style-type: none"> <li>Add, subtract, multiply and divide ( and all other similar words)</li> </ul>	between different numerical representations such as fractions, decimals and percentages.
<b>Autumn 2</b>	<b>Percentage s</b>	Through this topic the pupils should be taught: Per Cent means per hundred. Recognise the % of a shape that has been shaded. Change % into fractions and decimals and vice versa. Simplify fractions Find 10% of an amount and use this to find 5% and 1% Order fractions, decimals and % How to work out % in relation to sales How % relates to saving and loan rates How % relates to tax, VAT etc	<ul style="list-style-type: none"> <li>Percentage</li> <li>Hundred</li> <li>Per Cent</li> <li>Fractions</li> <li>Decimals</li> <li>Equivalent</li> <li>Simplify</li> <li>Interest</li> <li>Sales</li> <li>Tax</li> </ul>	<i>Building on</i> work completed at KS2. Pupils should be able to: <ul style="list-style-type: none"> <li>Understand that percent means 'out of a hundred.</li> <li>Recognise diagram representations of basic percentages such as 100%, 50% and 25%</li> </ul> <i>Building towards</i> pupils moving freely between different numerical representations such as fractions, decimals and percentages. Pupils will be able to calculate percentages using a calculator.
<b>Spring 1</b>	<b>Probability</b>	Through this topic the pupils should be taught: To understand that probability is a number that reflects the chance or likelihood that a particular event will occur. Appreciate that random processes are unpredictable. Find and justify probabilities based on equally likely outcomes in simple contexts. Identify all the possible mutually exclusive outcomes of a single event. Estimate probabilities by collecting data from a simple experiment and recording it in a frequency table. Compare experimental and theoretical probabilities in simple contexts.	<ul style="list-style-type: none"> <li>Probability</li> <li>Random</li> <li>Impossible</li> <li>Very unlikely</li> <li>Unlikely</li> <li>Even chance</li> <li>Likely</li> <li>Very likely</li> <li>Certain</li> <li>Odd</li> <li>Even</li> <li>Prime number</li> <li>Suites</li> <li>Experiment</li> <li>Fair</li> <li>Biased</li> <li>Frac, dec, %</li> </ul>	Building on.....  <b>Probability</b> Working with fraction, decimal and percentage equivalents in Autumn 2 of Year 7. <b>Negative numbers</b> Using the 4 Basic operations covered in Autumn 1 of Year 7. KS2 work on Geometry - position and direction including describing coordinates in quadrants. <b>Symmetry</b> KS2 work on geometric shapes including their properties and sizes (triangles, quadrilaterals, and regular polygons).  Building towards...

	<p><b>Negative numbers</b></p>	<p>Understand that the number line doesn't start at 0.  Read a thermometer.  Calculate the difference between numbers (including negatives).  Order positive and negative numbers from biggest to smallest and vice versa.  Be able to apply the rules of the 4 operations to positive and negative numbers.  Know which is the x and which is the y axes when using graphs.  Be able to plot points in the 4 quadrants.</p>	<ul style="list-style-type: none"> <li>● Negative</li> <li>● Positive</li> <li>● Difference</li> <li>● Order</li> <li>● Hotter/ colder/ bigger/ smaller</li> <li>● Coordinates</li> <li>● X and y axes</li> <li>● Quadrant</li> <li>● Origin</li> </ul>	<p><b>Probability</b>  Calculating the probability of dependent events using tree diagrams in year 8.</p> <p><b>Negative numbers</b>  Graphical representations of linear relationships. Connect coordinates, equations and graphs.</p> <p><b>Symmetry</b>  Rotational symmetry and order of rotational symmetry in Year 9.</p>
	<p><b>Shapes and symmetry</b></p>	<p>The names of different triangles.  How to measure shapes accurately.  The names of special quadrilaterals.  How to recognise parallel lines.  The names of special polygons.  How to work out the number of vertices on a shape.  Number of lines of symmetry in simple shapes.  How to label the sides of a shape using letters.  Through this topic the pupils should be taught to :  Identify simple lines of symmetry in 2D shapes.  Identify simple lines of symmetry in letters, flags and signs.</p>	<ul style="list-style-type: none"> <li>● Polygons</li> <li>● Types of triangles</li> <li>● Right angled</li> <li>● Equilateral</li> <li>● Isosceles</li> <li>● Scalene</li> <li>● Types of quadrilaterals</li> <li>● Rectangle</li> <li>● Square</li> <li>● Rhombus</li> <li>● Types of polygons</li> <li>● Triangle</li> <li>● Quadrilateral</li> <li>● Pentagon</li> <li>● Hexagon</li> <li>● Octagon</li> <li>● Line of symmetry</li> <li>● Mirror line</li> <li>● Reflection</li> </ul>	

			<ul style="list-style-type: none"> <li>• Vertical</li> <li>• Horizontal</li> </ul>	
<b>Spring 2</b>	<p><b>Angles</b></p> <p>Through this topic the pupils should know:          About clockwise and anticlockwise.  <math>\angle ABC</math> Angle notation and how to read it.          That an angle is a measure of a turn.          Angles are measured using a protractor and written in degrees.          A right angle is always 90 degrees.          Fractions of a turn and their relationship to degrees.          The sum of angles on a straight line, a full turn, in triangles and in quadrilaterals.          The different names given to angles depending on their size.          How to measure and draw angles accurately using a protractor and ruler.          The rules about vertically opposite angles.</p> <p><b>Number</b>          Number          Patterns/sequences</p> <p>Through this topic the pupils should:          Know about odd and even numbers.          Extending a number pattern using a rule.          Know how to work out the multiples of numbers.          Know how to work out the factors of numbers.          Know about and work with prime numbers.          Know about and work with square numbers.          Know about and work with triangle numbers.          Use robots to work out rules and patterns.</p>	<ul style="list-style-type: none"> <li>• Angles</li> <li>• Clockwise</li> <li>• Anti-clockwise</li> <li>• Protractor</li> <li>• Degrees</li> <li>• Acute angle</li> <li>• Right angle</li> <li>• Obtuse angle</li> <li>• Reflex angle</li> <li>• Vertically opposite</li> <li>• Quadrilateral</li> <li>• Quarter, half, three quarters, full turn</li> <li>• Estimate</li> <li>• Millimetre</li> <li>• Measure</li> <li>• Construction</li> </ul> <ul style="list-style-type: none"> <li>• Odd/ even numbers</li> <li>• Number patterns</li> <li>• Multiples</li> <li>• Factors</li> <li>• Prime numbers</li> <li>• Square numbers</li> <li>• Triangle numbers</li> <li>• Robots</li> </ul>	<p><i>Building on</i> work completed at KS2. Pupils should be able to:</p> <ul style="list-style-type: none"> <li>• Identify a full and half turn.</li> <li>• Identify basic angles such as 360, 180 and 90 degrees.</li> </ul> <p><i>Building towards</i> pupils being able to:</p> <ul style="list-style-type: none"> <li>• apply properties of angles at a point.</li> <li>• angles at a point on a straight line.</li> <li>• vertically opposite angles.</li> <li>• Understand the relationship between parallel lines and alternative and corresponding angles.</li> <li>• Use Pythagoras Theorem and trigonometric ratios in similar triangles to solve problems in right-angled triangles.</li> </ul> <p><i>Building on</i> work completed at KS2. Pupils should be able to:</p> <ul style="list-style-type: none"> <li>• Measure time in hours, minutes and seconds.</li> <li>• Estimate and read time with some accuracy.</li> <li>• Know the number of seconds in a minute, hours in a day, days in a</li> </ul>	

	<p><b>Life skills</b> Time</p>	<p>Through this topic the students will develop their understanding of: Basic units/measurements of time. 12/24 hour clocks Converting between different units. Calendars Timetables Planning time Convert between simple units of length (m, cm, mm), Mass (KG, g) and Time (Hours, minutes and seconds)</p>	<ul style="list-style-type: none"> <li>● Rule</li> <li>● Common factors and multiples</li> <li>● Square root</li> <li>● Second,</li> <li>● minute,</li> <li>● hour,</li> <li>● day,</li> <li>● week,</li> <li>● year</li> </ul>	<p>month.</p> <ul style="list-style-type: none"> <li>● Convert time from minutes to seconds, hours to minutes.</li> </ul> <p><i>Building towards</i> pupils being confident understanding and managing time, including:</p> <ul style="list-style-type: none"> <li>● Use of different timetables.</li> <li>● Using digital and analogue clocks.</li> <li>● Planning events.</li> </ul>
<p><b>Summer 1</b></p>	<p><b>Algebra</b> Function machines</p> <p><b>Averages</b></p>	<p>Through this topic the pupils should be able to: Find the opposite of an action Find the opposite of +, - x / Use function machines (robot screens) to inverse with numbers Use inverse operations to work out simple equations. Know that x over 2 means x divided by 2. Be able to work out the value of 2x and use this to find x. Draw function and inverse function machines. Change worded algebra questions into function machines to solve them. Use angle facts and apply them to algebra questions. Use trial and improvement to work out equations.</p>	<ul style="list-style-type: none"> <li>● Algebra</li> <li>● Inverse</li> <li>● Opposite</li> <li>● Function machine/ inverse function machines</li> </ul>	<p><i>Building on</i> work completed at KS2. Pupils should be able to:</p> <ul style="list-style-type: none"> <li>● Use simple formula.</li> <li>● Generate and describe linear number sequences.</li> <li>● Express missing number problems algebraically.</li> <li>● Find pairs of numbers that satisfy an equation with two unknowns.</li> </ul> <p><i>Building towards</i> pupils being confident to:</p> <ul style="list-style-type: none"> <li>● Use and interpret algebraic notation.</li> <li>● Substitute numerical values into formulae and expressions.</li> <li>● Simplify and manipulate algebraic expressions to maintain equivalence.</li> <li>● Use algebraic methods to solve linear equations in one variable.</li> <li>● Work with coordinates in all four quadrants.</li> </ul> <p><i>Building on</i> work completed at KS2. Pupils should be able to:</p> <ul style="list-style-type: none"> <li>● Interpret pie charts and line graphs.</li> <li>● Calculate and interpret the mean as</li> </ul>

	Ratio	<p>Finding the mean of a set of data.          Finding the mean from a table containing data.          Finding the mode of a set of data.          Finding the median of a set of data.          Finding the range of a set of data.          Looking at statistics and the way they can sometimes mislead you.          Explain the benefits of different types of scales for different people.</p> <p>To understand what is meant by the term ratio          To Share amounts into given ratios          To simplify ratios</p>	<ul style="list-style-type: none"> <li>● Mean</li> <li>● Mode/ Modal</li> <li>● Median</li> <li>● Range</li> <li>● Misleading</li> <li>● Biased</li> </ul>	<p>an average.</p> <p><i>Building towards</i> pupils being confident to:</p> <ul style="list-style-type: none"> <li>● Describe, interpret and compare observed distributions of a single variant though graphical representation of data.</li> <li>● Calculate the range, mode, mean and median of a data set.</li> <li>● Describe simple mathematical relationships between two variables in observational and experimental contexts.</li> </ul>
Summer 2	<b>Area &amp; perimeter</b>	<p>Count squares to find out the area of a shape.          Use the formula for finding the area of squares and rectangles          Use the formula for finding the area of a triangle          Find the area of compound shapes.          Use the formula for finding the area of a circle.          find the surface area of a 3D shape.</p>	<ul style="list-style-type: none"> <li>● Area</li> <li>● Perimeter</li> <li>● Formula</li> <li>● Estimate</li> <li>● Perpendicular</li> <li>● Radius</li> <li>● Circumference</li> <li>● Pi</li> </ul>	<p><i>Building on</i> work completed at KS2. Pupils should be able to:</p> <ul style="list-style-type: none"> <li>● Measure the lengths/widths/heights of objects.</li> <li>● Compare and order lengths/volumes.</li> <li>● Measure the perimeter of simple 2D shapes.</li> <li>● Find the area of rectilinear figures in cm and meters</li> <li>● Calculate the perimeter and area of rectangles.</li> </ul> <p><i>Building towards</i> pupils being confident to:</p> <ul style="list-style-type: none"> <li>● Calculating the properties of more complex shapes including 3D.</li> <li>● Apply formulae to calculate and solve problems involving rectangles, triangles and more complex shapes including 3D shapes.</li> </ul>

	<p><b>Algebra</b></p>	<p>Writing simple formulas from worded problems.          Writing formulas from pictorial patterns.          Learn the basic rules of algebra outlined at the bottom.          Rewrite formulas using the 7 rules.          Collecting like terms.          Substituting into formulas.</p>	<ul style="list-style-type: none"> <li>● Formula</li> <li>● Expressions</li> <li>● Simplify</li> <li>● Substitute</li> </ul>	<p><i>Building on work completed at KS2. Pupils should be able to:</i></p> <ul style="list-style-type: none"> <li>● Use simple formula.</li> <li>● Generate and describe linear number sequences.</li> <li>● Express missing number problems algebraically.</li> <li>● Find pairs of numbers that satisfy an equation with two unknowns.</li> </ul> <p><i>Building towards pupils being confident to:</i></p> <ul style="list-style-type: none"> <li>● Use and interpret algebraic notation.</li> <li>● Substitute numerical values into formulae and expressions.</li> <li>● Simplify and manipulate algebraic expressions to maintain equivalence.</li> <li>● Use algebraic methods to solve linear equations in one variable.</li> <li>● Work with coordinates in all four quadrants.</li> </ul>
	<p><b>Transformations</b></p>	<p>Identifying units of measure.          Converting between units of measure.          To reproduce basic shapes scaled up.          Determining the scale factor of shapes.          To reflect 2D shapes along vertical and horizontal lines.          To understand 90 &amp; 180 degree rotations using the origin 0,0.          To perform a translation of a basic shape in a single quadrant.          To perform a translation of a basic shape within 4 quadrants.</p>	<ul style="list-style-type: none"> <li>● Units of measure</li> <li>● Scale drawings</li> <li>● Scale factor</li> <li>● Reflection</li> <li>● Rotation</li> <li>● Translation</li> </ul>	<p><i>Building on work completed at KS2. Pupils should be able to:</i></p> <ul style="list-style-type: none"> <li>● Identify a variety of 2D and 3D shapes.</li> <li>● Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</li> </ul> <p><i>Building towards pupils being confident to:</i></p> <ul style="list-style-type: none"> <li>● Derive and illustrate properties of triangles and quadrilaterals, circles and other plane figures using appropriate language and technologies.</li> <li>● Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to</li> </ul>



				derive the properties of regular polygons.
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