



# SUNNYDOWN SCHOOL

## MATHEMATICS CURRICULUM PLAN

Subject	<b>Maths</b>	Year group	<b>Y8</b>
Subject Intent	<p>Year 8 Maths has two key learning priorities flowing through the curriculum which allows for both retrieval and an increase in the depth of knowledge. We aim to have a calm and safe learning environment with equality of opportunity for all students, promoting the development of inclusive learning opportunities. Mistakes are accepted and encouraged as a method for learning something new.</p> <p>Throughout KS3, Sunnydown students will have the opportunity to revisit content covered in year 7 and earlier, which will improve recall and allow for skills to be built upon. To extend and challenge, students are encouraged to apply what they have learnt to problem solving. These could be multi-step questions that require the use of numerous mathematical skills or by giving a clear reasoning and explanation for their solutions. They will also be exposed to more complex algebraic concepts such as the nth term, solving equations and linear graphs.</p>		

Term	Topic	Core learning	Key concepts	Sequencing
<b>Autumn 1</b>	<b>Number</b> Four operations	Through this topic the students will be able to: <ul style="list-style-type: none"> <li>● Add and subtract 2 and 3 digit numbers using an efficient written method</li> <li>● To count on and take away in 10's</li> <li>● Use a number square/ line effectively</li> <li>● Add and subtract whole and decimal numbers using an efficient written method</li> <li>● Multiply and divide integers using efficient written methods like long multiplication, repeated addition and Napier's bones</li> <li>● Multiply and divide whole and decimal numbers using efficient written methods</li> <li>● Make the links between +, - and <math>\times, \div</math> explicit</li> <li>● Encourage use of mental calculations and strong number bonds</li> </ul>	Adding, subtracting, dividing and multiplying in a variety of different contexts.	Building on number work from KS2 and Y7 and making sure the key concepts that appear in all areas of maths are solidified.  Building towards applying addition, subtraction, multiplication and division knowledge and skills to all areas of the maths curriculum.

		<ul style="list-style-type: none"> <li>● Emphasise the importance of knowing your times tables</li> <li>● Emphasise the importance of checking an answer using a quick estimation</li> <li>● Select from a range of checking methods, including estimating and inverse operations</li> <li>● Multiplying and dividing numbers by 10, 100.....</li> <li>● Ordering decimal numbers</li> <li>● +, - decimal numbers</li> <li>● Multiply and divide simple decimal numbers</li> </ul>		
	<b>Geometry</b> Area and Perimeter	<p>Through this topic the students will be able to:</p> <ul style="list-style-type: none"> <li>● Count squares to find out the area of a shape</li> <li>● Use the formula for finding the area of squares, rectangles and parallelograms</li> <li>● Spot the perpendicular height of an object</li> <li>● Use the formula for finding the area of a triangle</li> <li>● Find the area of compound shapes.</li> <li>● Use the formula for finding the area of a circle.</li> <li>● Find the surface area of a 3d shape.</li> <li>● How to work out the perimeter of a shape by counting squares</li> <li>● How to use the information provided to work out the perimeter of a rectangle and compound shape</li> <li>● How to work out the Hypotenuse of a right-angle triangle and use this to work out the perimeter of a compound shape that includes right angled triangles.</li> <li>● Where Pi comes from and how to use it</li> <li>● How to use a formula to work out the circumference of a circle.</li> </ul>	Understanding the difference between area and perimeter and how to calculate them on rectangles, parallelograms, trapeziums, triangles and circles.	<p>Building on shape and measure learning from KS2 &amp; Y7. Ensure the basics (squares and rectangles) are understood before moving onto more complex shapes.</p> <p>Building towards calculating the area and perimeter of complex compound shapes and the volume of a variety of 3D shapes.</p>
<b>Autumn 2</b>	<b>Geometry</b> Volume	<p>Through this topic the students will be able to:</p> <ul style="list-style-type: none"> <li>● Order everyday objects in order of volume</li> <li>● Estimate the volume of everyday containers</li> <li>● Count cubes to find the volume of simple 3D shapes</li> <li>● Use the formula Length x width x height to work out the volume of simple cubes and cuboids</li> <li>● Use the above formula when calculating the volume of</li> </ul>	Learning the formulas for calculating the volume of a variety of 3D prisms.	<p>Building on area and perimeter learning from Autumn 1 - extending into 3D shapes. Curriculum link to DT.</p> <p>Building towards learning how to calculate the volume of more</p>

		<p>more complicated shapes</p> <ul style="list-style-type: none"> <li>Find the volume of prisms by finding the area of one of its faces and x it by the length</li> <li>Understand the link between <math>1 \text{ cm}^3</math> and <math>1 \text{ ml}</math></li> </ul>		complex 3D shapes (spheres, cones etc.)
	<b>Geometry</b> Transformations	<p>Through this topic the students will be able to:</p> <ul style="list-style-type: none"> <li>Reflect simple 2D shapes in horizontal and vertical mirror lines</li> <li>Reflect simple 3D shapes in horizontal and vertical mirror lines</li> <li>Translate simple shapes</li> <li>Translate simple shapes using vectors</li> <li>Rotate shapes a specified amount both CW and ACW around a given centre</li> <li>Work out the order of rotational symmetry of simple shapes</li> <li>Understand and use coordinates in all four quadrants</li> <li>Be able to plot points</li> </ul>	Understanding the difference between reflection, rotation, translation and enlargement.	<p>Building on shape and symmetry learning from KS2 and Y7. Making sure they have a solid understanding of reflection and rotation. Coordinates link to humanities.</p> <p>Building towards understanding transformations through 4 quadrants and applying knowledge to problem solving.</p>
	<b>Algebra</b> Number patterns & sequences	<p>Through this topic the students will be able to:</p> <ul style="list-style-type: none"> <li>Solve simple number patterns by finding a simple rule</li> <li>Explain what is happening in the number pattern using words and numbers</li> <li>Use the number in the rule to work out a simple formula that will find any term in that sequence</li> <li>Continue a negative number sequence</li> </ul>	Exploring the nth term, finding the nth term rule and writing a sequence from a given rule.	<p>Building on number sequences that are learned in KS2 and Y7.</p> <p>Building towards becoming more confident in algebra, using letters in equations and the problem solving required. Curriculum link to Science.</p>
<b>Spring 1</b>	<b>Algebra</b> Expressions, equations, rules and formula	<ul style="list-style-type: none"> <li>Use knowledge of inverse operations to solve simple equations</li> <li>Simplify expressions by collecting like terms involving two letters and some numbers</li> <li>Substitute numerical values into a formula</li> <li>Simplify expressions involving several letters and numbers</li> <li>Use and interpret algebraic notation</li> <li>Solve simple linear equations involving a and 2a questions</li> <li>Simplify expressions involving brackets</li> </ul>	Look at the difference between basic expressions and equations, simplifying and factorising.	<p>Building on missing box and function machine problems from KS2 and Year 7.</p> <p>Building towards becoming more confident using letters within Maths and problem solving.</p>

		<ul style="list-style-type: none"> <li>● Use algebraic methods to solve simple linear equations</li> <li>● Solve equations involving one set of brackets</li> <li>● Solve equations involving a letter over a number (division)</li> <li>● Simplify an expression by multiplying out of brackets</li> <li>● Solve equations with unknowns on both sides of the = sign</li> <li>● Solve an equation by multiplying out of brackets</li> </ul>		
	<b>Number</b> Fractions, decimals and percentages	Through this topic the students will be able to: <ul style="list-style-type: none"> <li>● Find a simple fraction of an amount e.g. <math>\frac{1}{2}</math> of £80 and find more complicated fraction of an amount e.g. <math>\frac{3}{4}</math> of £120 using written and calculator methods</li> <li>● Use the a b/c button on the scientific calculators.</li> <li>● Find equivalent fractions and simplify given fractions</li> <li>● Change from mixed numbers into top heavy fractions and vice versa.</li> <li>● Use the 4 operations with fractions.</li> <li>● Understand the links between frac/dec/%</li> <li>● Convert between fractions, decimals and percentages</li> </ul>	Fractions, decimals and percentages are all linked. The ability to change between them is key when problem solving.	Building on previous learning on fractions, decimals and percentages. This topic is introduced in KS2 and Sunnydown students will have a wide range of knowledge depending on their previous learning experiences. As such we cover all prior learning depending on the needs of the class. Link to Food Tech & Science.  Building towards confidently converting between fractions, decimals and percentages and applying knowledge to multistep problems.
<b>Spring 2</b>	<b>Probability</b>	Through this topic the students will be able to: <ul style="list-style-type: none"> <li>● Place everyday experiences on a probability scale</li> <li>● Use dice, cards, spinners and coins to work out the theoretical probability of certain outcomes</li> <li>● Realise that probabilities can be shown using fractions/decimals/percentages and all of the outcomes always add up to 1</li> <li>● Remember how to cancel fractions in order to give fully simplify answers</li> <li>● Design simple sample space diagrams to show all possible outcomes of an activity/ event</li> </ul>	Whilst we can use terms like 'impossible, likely, certain' to describe the chances of something happening, students will learn how to calculate a more accurate probability of something happening with fractions, decimals and percentages.	Building on prior knowledge of probability from KS2 and previous topic of fractions, decimals and percentages. Links to science.  Building towards applying knowledge to multistep problems.

	<ul style="list-style-type: none"> <li>• Work out if a game is fair or if the equipment or rules are bias</li> </ul>		
<b>Geometry</b> Time	<p>Through this topic the students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand time in analogue and digital</li> <li>• Use 24 hour clock</li> <li>• Apply knowledge to problem solving and real life skills such as timetables</li> </ul>	<p>Checking what knowledge they have of telling the time on analogue and digital and then applying to real life situations.</p>	<p>Building on prior knowledge of time from KS2. It is taught explicitly in Y4 but not a focus in UKS2 and in preparation for SATs. This means that there is often a range of levels of understanding and confidence with telling the time.</p> <p>Links to Food and Nutrition &amp; DT</p> <p>Building towards applying knowledge to multistep problems.</p>
<b>Number</b> Multiples, Factors, Primes	<p>Through this topic the students should know how to:</p> <p>Square a number and find a number's square root realising that they are the opposite operations</p> <p>Quickly work out simple number bonds</p> <p>Use a variety of strategies to complete a multiplication square</p> <p>Use a multiplication square to multiply and divide</p> <p>Understand factors and multiples (LCF &amp; HCM)</p> <p>Round numbers to the nearest whole, nearest 10 and 100</p> <p>Use rounded numbers to work out difficult questions and check their answers to see if they are reasonable</p> <p>Use estimation strategies to answer a variety of real life mathematical problems</p>	<p>This unit is used to revisit basic operations from Autumn 1, going over and using the written methods to check mental strategies.</p>	<p>Building on basic operations learning from Autumn 1. Understanding of rounding and mental strategies to quickly estimate an answer.</p> <p>Building towards being able to apply knowledge to longer exam style questions.</p>

<b>Summer 1</b>	<b>Geometry</b> Angles	Through this topic the students will be taught: <ul style="list-style-type: none"> <li>• Naming angles</li> <li>• Estimating and measuring angles</li> <li>• Drawing angles</li> <li>• Calculating angles</li> <li>• Labelling angles</li> <li>• Calculating angles on a straight line and in a full turn</li> <li>• Triangle properties and angles inside triangles</li> <li>• Parallel line properties</li> <li>• Quadrilateral properties</li> <li>• Intersecting line properties</li> </ul>	Learn how to use a protractor accurately to measure and draw angles. Use knowledge to find missing angles.	Building on basic angle and line learning from KS2 and Y7. Make sure the types of angles are known and how to find the size of an angle. Links to DT & Science  Building towards being able to calculate missing angles from a variety of shapes/lines.
	<b>Ratio</b>	Through this topic the students should know how to: <ul style="list-style-type: none"> <li>• Share things into unequal parts</li> <li>• Simplify ratio</li> <li>• Showing ratio as words, decimals, percentages and fractions</li> <li>• Solve problems</li> <li>• Enlarge shapes by a specified scale factor around the centre of enlargement</li> <li>• Understand scale factors and apply to maps and diagrams</li> </ul>	Understanding what ratio is, how to share amounts between ratios and solve problems.	Building on prior knowledge from KS2 and Y7.  Building towards applying to problem solving - recognising when the question involves ratios.
<b>Summer 2</b>	<b>Statistics</b>	Through this topic the students should know how to: <ul style="list-style-type: none"> <li>• Collect data using a tally chart</li> <li>• Design a survey and response boxes</li> <li>• Write a prediction</li> <li>• Display data in bar chart, line graph and pie chart</li> <li>• Analyse data and write a conclusion</li> <li>• Interpret graphs</li> <li>• Know how to read a graph (along the corridor up the stairs etc.)</li> <li>• Calculate averages (Mean, mode, median &amp; range)</li> </ul>	Look at a variety of different charts and graphs, go through how to read and draw them. We will also go through collecting data, writing a prediction and a conclusion.	Building on prior learning of charts and graphs from KS2 and Y7 and coordinates from Summer 2. Students will have a variety of experiences and levels of understanding.  Building towards being able to accurately collect data and plot graphs in Maths and Science.
	<b>Algebra</b>  Coordinates and straight line	Through this topic the students should know how to: <ul style="list-style-type: none"> <li>• Understand and use coordinates in the first, second and third quadrants</li> <li>• Understand and use coordinates in all four quadrants</li> </ul>	Understanding how to read and plot coordinates in four quadrants.	Building on prior knowledge of coordinates and algebra from earlier in KS3 and KS2.

	graphs	<ul style="list-style-type: none"> <li>• Draw a linear graph from a table of positive values</li> <li>• Draw a linear graph from a table of negative values</li> </ul>	Understanding the relationships between the x and y axis and how a table of values can be translated onto a coordinate grid.	Building towards being able to apply algebra understanding into linear and quadratic graphs.
	<b>Revision</b>	This will vary by class. Any time left at the end of the year can be used to recap over anything or complete projects that focus on the real world use of maths.		