

SUBJECT:	Maths	YEAR GROUP:	9
PURPOSE OF STUDY			
<p>Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to Science, Technology and Engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.</p>			
THE NATIONAL CURRICULUM FOR MATHS AIMS TO ENSURE THAT ALL PUPILS:		NATIONAL CURRICULUM LINKS	
<p>The national curriculum for mathematics aims to ensure that all pupils:</p> <ul style="list-style-type: none"> • become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. • reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language • can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions. 		<p>Cross curricular links:</p> <p>Science: Use of graphs to display data; Use of algebraic formula in chemistry and physics; Use of addition, subtraction, multiplication and division.</p> <p>Humanities: Use of graphs to display data; Interpretation of data in graphs, table and charts.</p> <p>English: Use of inference in worded problems; Retrieval of relevant information.</p> <p>Art: Use of shapes and angles in artists work.</p>	

TOPICS COVERED:

- Straight Line Graphs
- Forming and Solving Equations
- Testing Conjectures
- Three Dimensional Shapes
- Constructions and Congruency
- Numbers
- Using Percentages
- Maths and Money
- Deduction
- Rotation and Transition
- Pythagoras' Theorem
- Enlargement and Similarity
- Solving Ration and Proportion Problems
- Rates
- Probability
- Algebraic Representation

INTENT OF SUBJECT:

The study of Maths throughout year 7 will build on the pupils learning from KS2 and equip them with the skills needed to become fluent in the areas of Maths they require for their journey through each year of school and a goal of completing examinations in the subject at the end of KS4. The maths curriculum also aims to develop a love of the subject and allow pupils to understand the real-life applications of the skills they learn so they are able to continue to use them in their lives beyond school. This will be done through the study of: Algebraic thinking; Place value & proportion; Applications of number; Directed number; Fractional thinking; Lines & angles; Reasoning with number.

SKILLS OVERVIEW BY HALF TERM:
AUTUMN ONE

- Lines parallel to the axis, $y=x$ and $y=-x$
- Using tables of values
- Compare gradients
- Compare intercepts
- Understand and use $y=mx+c$

AUTUMN TWO

- Know names of 2D and 3D shapes
- Recognise prisms (including language of edges and vertices)
- Accurate nets of cuboids and other 3D shapes
- Sketch and recognise nets of cuboids and other 3D shapes
- Plans and elevations

<ul style="list-style-type: none"> – Write an equation in the form $y=mx+c$ – Find the equation of a line from a graph – Interpret gradients and intercepts of real-life graphs – Model real-life graphs involving inverse proportion – Explore perpendicular lines – One and two-step equations and inequalities – Equations and inequalities with brackets – Inequalities with negative numbers – Solve equations with unknowns on both sides – Solve inequalities with unknowns on both sides – Equations and inequalities in other mathematical contexts – Formulae and equations – Rearrange formulae (one-step) – Rearrange formulae (two-step) – Rearrange complex formulae – Factors, multiples and primes – True or false – Always, sometimes, never true – Show that – Conjectures about number – Expand a pair of binomials – Conjectures with algebra – Explore the 100 grid – Expand three binomials 	<ul style="list-style-type: none"> – Find area of 2D shapes – Surface area of cubes and cuboids – Surface area of triangular prisms – Surface area of a cylinder – Volume of cubes and cuboids – Volume of other 3D shapes - prisms and cylinders – Explore volumes of cones, pyramids and spheres – Draw and measure angles – Construct and interpret scale drawings – Locus of distance from a point – Locus of distance from a straight line – Locus equidistant from two points – Construct a perpendicular bisector – Construct a perpendicular from a point – Construct a perpendicular to a point – Locus of distance from two lines – Construct an angle bisector – Construct triangles from given information – Identify congruent figures – Explore congruent triangles – Identify congruent triangles
SPRING ONE	SPRING TWO
<ul style="list-style-type: none"> – Integers, real and rational numbers – Understand and use surds – Work with directed number – Solve problems with integers – Solve problems with decimals – HCF and LCM – Adding and subtracting fraction – Multiplying and dividing fractions 	<ul style="list-style-type: none"> – Angles in parallel lines – Solve angle problems using chains of reasoning – Angle problems with algebra – Conjectures with angles – Conjectures with shapes – Link constructions and geometrical reasoning – Identify the order of rotational symmetry of a shape – Compare and contrast rotational symmetry with line symmetry

<ul style="list-style-type: none"> – Solve problems with fractions – Numbers in standard form – Use the equivalence of fractions, decimals and percentages – Calculate percentage increase and decrease – Express a change as a percentage – Solve reverse percentage problems – Recognise and solve percentage problems (non-calculator) – Recognise and solve percentage problems (calculator) – Solve problems with repeated percentage change – Solve problems with bills and bank statements – Calculate simple interest – Calculate compound interest – Solve problems with Value Added Tax – Calculate wages and taxes – Solve problems with exchange rates – Solve unit pricing problems 	<ul style="list-style-type: none"> – Rotate a shape about a point on a shape – Rotate a shape about a point not on a shape – Translate points and shapes by a given vector – Compare rotation and reflection of shapes – Find the result of a series of transformations – Squares and square roots – Identify the hypotenuse of a right-angled triangle – Determine whether a triangle is right-angled – Calculate the hypotenuse of a right-angled triangle – Calculate missing sides in right-angled triangles – Use Pythagoras' theorem on coordinate axes – Explore proofs of Pythagoras' theorem – Use Pythagoras' theorem in 3D shapes
<p>SUMMER ONE</p>	<p>SUMMER TWO</p>
<ul style="list-style-type: none"> • Recognise enlargement and similarity • Enlarge a shape by a positive integer scale factor • Enlarge a shape by a positive integer scale factor from a point • Enlarge a shape by a positive fractional scale factor • Enlarge a shape by a negative scale factor • Work out missing sides and angles in a pair of given similar shapes • Solve problems with similar triangles • Explore ratios in right-angled triangles 	<ul style="list-style-type: none"> – Single event probability – Relative frequency - including convergence – Expected outcomes – Independent events – Use tree diagrams – Use tree diagrams to solve without replacement problems – Use diagrams to work out probabilities – Draw and interpret quadratic graphs – Interpret graphs, including reciprocal and piece-wise – Investigate graphs of simultaneous equations – Represent inequalities

- Solve problems with direct proportion
- Direct proportion and conversion graphs
- Solve problems with inverse proportion
- Graphs of inverse relationships
- Solve ratio problems given the whole or a part
- Solve best buy problems
- Solve problems involving ratio and algebra
- Solve speed, distance and time problems without a calculator
- Solve speed, distance and time problems with a calculator
- Use distance-time graphs
- Solve problems with density, mass and volume
- Solve flow problems and their graphs
- Rates of change and their units
- Convert compound units