

<h1>Year 9</h1> <h2>Maths</h2>			
<b>1. Algebra techniques</b>	Fluent in the manipulation of algebraic expressions, including substitution, simplifying and factorising. Confident with the terminology and notation used in algebra. Able to form and solve equations in one variable. Able to use mathematical formulae in a range of contexts, including in problems requiring rearranging of the formula.	Fluent in the language and notation of algebra, and manipulation of algebraic expressions, including substitution, simplifying and factorising. Confident in solving equations in one variable. Able to work with more advanced expressions and formulae, including products of binomials, rearranging formulae and using algebra to model situations or procedures.	Fluent in the language and notation of algebra, and manipulation of algebraic expressions, including substitution, simplifying and factorising. Confident in solving equations in one or more than one variable. Able to work with more advanced expressions and formulae, including products of binomials and rearranging formulae. Able to use complex algebra to model situations or procedures and then use those expressions and formulae to solve problems.
<b>2. Number and powers</b>	Fluently and accurately perform the 4 operations with all types of number: integers, fractions, decimals, directed numbers. Understand and use fractions and percentages as operators. Understand the equivalence between different types of number and fluently convert between them. Be confident in the language, notation and concepts of factors, multiples, powers and roots.	Fluently and accurately perform the 4 operations with all types of number: integers, fractions, decimals, directed numbers. Understand and use fractions and percentages as operators. Understand the equivalence between different types of number and fluently convert between them. Be confident in the language, notation and concepts of factors, multiples, powers, roots and standard form, and be able to express a number as a product of its prime factors. Be able to approximate using rounding and to understand and calculate the resulting rounding errors.	Fluently and accurately perform the 4 operations with all types of number: integers, fractions, decimals, directed numbers. Understand and use fractions and percentages as operators. Understand the equivalence between different types of number and fluently convert between them. Be confident in the language, notation and concepts of prime factor decomposition, standard form, index laws and surds. Be able to approximate using rounding and to understand and calculate the resulting rounding errors.
<b>3. Algebra graphs</b>	Be able to accurately plot a linear graph from its equation. Understand the relationship between the points on a line and the equation of the line. Recognise and interpret the general form of the equation of a line, $y = mx + c$ . Interpret real life mathematical relationships from graphical representations.	Be able to accurately plot linear and quadratic graphs from their equations. Understand the relationship between the points on a graph and the equation of the line or curve. Recognise and interpret the general form of the equation of a line, $y = mx + c$ and use it to solve problems. Interpret real life mathematical relationships from graphical representations and use them to find approximate solutions to problems in a range of contexts.	Be able to accurately plot linear and quadratic graphs from their equations. Understand the relationship between the points on a graph and the equation of the line or curve. Recognise and interpret the general form of the equation of a line, $y = mx + c$ and use it to solve problems, including finding the equation of parallel or perpendicular lines. Interpret real life mathematical relationships from graphical representations and use them to find approximate solutions to problems in a range of contexts. Recognise and name common non-linear graphs.

<b>4: Geometry - constructions and transformations</b>	<p>Fluent in the use and interpretation of the language and notation of geometry. Knows the basic angle facts of shapes and parallel lines and can apply these to solve problems. Knows the formulae for calculating the area of common 2D shapes and is able to find the perimeter and area of a range of shapes, including circles. Is able to use geometric tools (ruler, protractor, compasses) to accurately construct bisectors, perpendiculars and triangles. Is able to identify 4 types of transformations on a coordinate grid.</p>	<p>Fluent in the use and interpretation of the language and notation of geometry. Knows the basic angle facts of shapes and parallel lines and can apply these to solve problems. Knows the formulae for calculating the area of common 2D shapes and is able to solve problems involving the perimeter and area of a range of shapes, including circles. Is able to use geometric tools (ruler, protractor, compasses) to accurately construct bisectors, perpendiculars and triangles, and is familiar with the criteria for congruence of triangles. Is able to identify and perform 4 types of transformations on a coordinate grid, including constructing similar shapes by enlargement.</p>	<p>Fluent in the use and interpretation of the language and notation of geometry. Can apply known angle facts to solve problems. Knows the formulae for calculating the area of common 2D shapes and is able to solve problems involving the perimeter and area of a range of shapes, including circles. Is able to use geometric tools (ruler, protractor, compasses) to accurately construct bisectors, perpendiculars and triangles, and is familiar with the criteria for congruence of triangles. Can apply constructions skills and principles to solve loci problems. Is able to identify and perform 4 types of transformations on a coordinate grid, including enlargement by negative/fractional scale factors.</p>
<b>5. Probability and statistics</b>	<p>Understand the principles of chance and probability, and use language to compare and categorise different events by their probability of occurring. Be able to list all the equally likely possible outcomes of an event, and use that calculate theoretical probability. Be able to gather and use experimental data to estimate probabilities of outcomes that are not equally likely.</p>	<p>Understand the ideas of theoretical and experimental probability; use numbers to express probabilities of certain events. Generate sample space diagrams for single and combined events to calculate theoretical probabilities. Know and understand the properties of mutually exclusive, independent, complementary and exhaustive events. Be able to use data calculate and interpret relative frequencies.</p>	<p>Understand the ideas of theoretical and experimental probability; use numbers to express probabilities of certain events. Generate sample space diagrams (including tree diagrams) for single and combined events to calculate theoretical probabilities. Know and understand the properties of mutually exclusive, independent, complementary and exhaustive events. Be able to use data calculate relative frequencies, and use them to state expected outcomes.</p>
<b>6. Geometry - triangles and 3D shapes</b>	<p>Fluent in the language of geometry; knowledgeable about the properties of 2D and 3D shapes and able to use them to solve problems. Know and use various formulae for area, surface area and volume. Calculate the area and perimeter of 2D (compound shapes) using known formulae, including Pythagoras' Theorem for right-angled triangles.</p>	<p>Fluent in the language of geometry; knowledgeable about the properties of 2D and 3D shapes and able to use them to solve problems. Know and use various formulae for area, surface area and volume and use them to solve problems in 2D and 3D. Find missing angles and/or lengths in right-angled triangles using Pythagoras' Theorem and trigonometric ratios.</p>	<p>Fluent in the language of geometry; knowledgeable about the properties of 2D and 3D shapes and able to use them to solve problems. Know and use various formulae for area, surface area and volume and use them to solve problems in 2D and 3D. Find missing angles and/or lengths in right-angled triangles using Pythagoras' Theorem and trigonometric ratios, including problems in 3D or involving algebra. Use geometric properties, formulae and relationships to prove simple results.</p>