Year: 10
Subject: Mathematics

Spring Term		
Overarching Topic:		
What has come before and what comes later:	*Y=mx+c, sampling and averages, pie charts, transformations, standard form, sequences, percentages*	*Y=mx+c, graphical solutions of inequalities, sampling, cumulative frequency and box plots, limits of accuracy, transformations, indices and surds, review of angles properties, review of bearings and constructions, recurring decimals*
	Foundation	*Higher*
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	*Can you find equivalent fractions?* *Can you rewrite a group of fractions with equal denominator suing equivalent fractions?* *Can you order fractions?* *Can you express one quantity as a fraction of another in its simplest terms?* *Do you know the difference between an improper and proper fraction?* *Can you find a fraction of an amount?* *Can you add fractions together (including where one is a mixed number)?* *Can you subtract fractions together (including where one is a mixed number)?* *Can you multiply fractions together (including where one is a mixed number)?* *Can you divide fractions together (including where one is a mixed number)?* *Can you divide a quantity into two ratio parts?* *Can you use ratios in conversions?* *Can you use ratios in scales?* *Can you use ratios as comparisons?* *Can you relate ratios to fractions and linear functions?*	*Can you solve problems involving direct proportion involving graphical and algebraic representations?* *Can you solve problems involving inverse proportion involving graphical and algebraic representations?* *Do you understand when x is inversely proportional to y is the same as x is proportional to 1/y?* *Can you interpret and construct equations that describe direct and inverse proportion?* *Can you recognise and interpret graphs that illustrate direct and inverse proportion?* *Can you construct histograms with equal and unequal class widths?* *Do you know when the use of histograms is appropriate?* *Are you able to solve problems involving histograms?* *Do you know and can you use the formula for area of a circle?* *Do you know and can you use the formula for circumference of a circle?* *Can you identify and apply circle definitions and properties including: chord, tangent, arc, sector, and segment?*

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	Can you solve problems involving ratios and fractions? *Can you express a multiplicative relationship between two quantities as a ratio or a fraction?* *What is the meaning of congruent?* *Can you identify when two shapes are congruent?* *What are the properties for two shapes to be similar?* *Can you compare lengths of shapes using ratios?* *Can you find the scale factor for similar shapes?* *Can you use scale factors to find missing lengths of similar shapes?* *Can you simplify algebraic expressions by collecting like terms?* *Can you expand a single bracket?* *Can you factorise expressions by taking out common factors?* *Can you expand the product of 2 brackets?* *Can you rearrange a formula to change the subject?* *Do you know the difference between an equation and an identity?* *Can you show algebraically where two algebraic expressions are equivalent?* *Can you interpret simple expressions as inputs and outputs?* *Do you understand the concepts and vocabulary of expressions and formulae?* *Can you substitute values into expressions and formulae?* *Do you know and can apply formula for area of rectangles, parallelograms, triangles and trapezia?* *Do you know the formula for area of circle?* *Do you know the formula for circumference of a circle?*	*Can you calculate arc length, angles, and areas of sectors of circles?* *Can you calculate and work with circle calculations in terms of* π? *Can you apply and prove standard circle theorems concerning angles, radii, tangents, and chords and use them to prove related results?* *Can you solve linear equations in one unknown including those with the unknown on both sides?* *Can you derive an equation, solve the equation, and interpret the solution?* *Can you solve two simultaneous equations in two variables algebraically?* *Can you deduce roots of quadratic functions algebraically?* *Can you solve quadratic equations including those that need rearranging using factorisation?* *Can you simplify and manipulate algebraic expressions by factorising quadratic expressions of the form* $ax^2 + bx + c$? *Can you solve a quadratic equation by completing the square?* *Can you solve a quadratic equation using the quadratic formula?* *Can you solve simultaneous equations in two variables where one is quadratic?* *Can you recognise, sketch, and interpret graphs of quadratic equations?* *Can you find approximate solutions to quadratic equations using a graph?*

	Can you calculate perimeters of 2D shapes? *Can you calculate areas of composite shapes?* *Can you use standard units of mass, length, time, and money where appropriate?* *Do you know and can apply formulae for volume of cuboids and right prisms (including cylinders)?* *Do you know and can apply formulae for surface area of cuboids and right prisms (including cylinders)?* *Can you calculate the surface area for composite solids?*	*Can you identify and interpret roots, intercepts, turning points of quadratic equations graphically?* *Can you deduce turning points of quadratic functions by completing the square?* *Can you solve quadratic inequalities in one variable?*