TNHA Scheme of Work

Year Group- 10	Developed by: SCA / RCU	Number of lessons:

Block	Topic	Lesson Objectives *What most students should be able to do….*	Suggested timing (hours)	Assessment opportunities
1	Congruence, Similarity and Enlargement	• Enlarge a shape by a positive integer scale factor • Enlarge a shape by a fractional scale factor • **Enlarge a shape by a negative scale factor** • Identify Similar Shapes • Work out missing sides and angles in similar shapes • Use parallel line rules to work out missing angles • Establish a pair of triangles are similar • To be able to calculate angles in polygons		
2	Trigonometry	• Explore ratio in similar right angled triangles • Work fluently with the hypotenuse, opposite and adjacent sides • Use the tan, sin and cos ratio to find missing sides • Use the tan, sin and cos ratio to find missing angles • Calculate sides in right angled triangles using Pythagoras' Theorem • **Use Trigonometry in 3D Shapes** • **Use the formula to find the area of a triangle**		

		• **Understand and use the sine rule** • **Use and understand the cosine rule** • **Choose between the sine and cosine rule**		
3	Equations and Inequalities and Representing solutions	• Understand the meaning of a solution • Form and solve 1-2 step equations • Form and solve 1-2 step inequalities • Show solutions to inequalities on a number line • Interpret representations on a number line as an inequality • **Represent solutions to inequalities using set notation** • Draw straight line graphs • Find solutions to equations using straight line graphs • **Represent solutions to single inequalities on a graph** • **Represent solutions to multiple inequalities on a graph** • Form and solve 2-sided equations • Form and solve 2-sided inequalities • **Solve quadratics by factorisation** • **Solve quadratic inequalities in one variable**		SKIP BLOCK
4	Simultaneous Equations	• Understand that equations can have more than one solution • Determine whether a given (x,y) is a solution to a pair of linear equations • Solve a pair of linear simultaneous equations by substituting a known variable/substituting an expression • Solve a pair of simultaneous equations using graphs • Solve a pair of simultaneous equations by elimination • Use a given equation to derive related facts • Form and solve a pair of linear simultaneous equations from given information		

		• **Determine whether a given (x,y) is a solution to both a linear and quadratic equation** • **Solve a pair of linear/quadratic equations using graphs and algebra**		
CHRISTMAS				
5	Angles and Bearings	• Use cardinal directions and related angles • Draw and interpret scale diagrams • Understand and represent bearings • Measure and read bearings • Make scale drawings using bearings • Calculate bearings using angles rules • Solve bearing problems using Pythagoras and Trigonometry • **Solve bearings problems using the sine and cosine rules**		
6	Working with Circles	• Recognise and label parts of a circle • Calculate fractional parts of a circle • Calculate the length of an arc • Calculate the area of a sector • **Solve problems using all circle theorems** • Understand and use the volume of a cylinder and cone • Understand and use the volume of a sphere • Understand and use the surface area of a cylinder and cone • **Solve area and volume problems involving similar shapes**		
7	Vectors	• Understand and represent vectors • Use and read vector notation • Draw and understand vectors multiplied by a scalar • Draw and understand addition and subtraction of vectors • **Explore vector journeys in shapes**		

		• **Explore quadrilaterals using vectors** • **Understand parallel vectors** • **Explore collinear points using vectors** • **Use vectors to construct geometric arguments and proof**		
8	Ratios and Fractions	• Compare quantities using a ratio • Link ratios and fractions • Share in a ratio (given total or one part) • Use ratios and fractions to make comparisons • Link ratios and graphs • Solve problems with currency conversion • Link ratios and scales • Use and interpret ratios of the form 1:n and n:1 • Solve 'best buy' problems • Combine a set of ratios • Link ratio and algebra • **Ratio in area problems** • **Ratio in volume problems** • Mixed ratio problems		
9	Percentages and Interest	• Convert and compare fractions, decimals and percentages • Work our percentages of amounts (calc/non-calc) • Increase and decrease by a given percentage • Express one number as a percentage of another • Repeated percentage change		

		• Solve problems involving growth and decay • **Understand iterative processes** • Solve problems involving percentages, ratios and fractions.		
10	Probability	• Know how to add, subtract and multiply fractions • Find probabilities using equally likely outcomes • Use the property that probabilities sum to 1 • Using experimental data to estimate probabilities • Fins probabilities from tables, Venn Diagrams and frequency trees • Construct and interpret sample spaces for more than one event • Calculate probability with independent events • Use tree diagrams for independent events • Use tree diagrams for dependant events • **Construct and interpret conditional probabilities (tree diags)** • **Construct and interpret conditional probabilities (Venn diagrams and 2-way tables)**		
EASTER				
11	Collecting, representing and	• Understand populations and samples • **Construct a stratified sample** • Primary and secondary data		

	interpreting data	• Construct and interpret frequency tables and frequency polygons • Construct and interpret two-way tables • Construct and interpret line and bar charts (all types) • Construct and interpret pie charts • Criticise charts and graphs • **Construct histograms** • **Interpret histograms** • Find and interpret averages from a list • Find and interpret averages from a table • Construct and interpret time-series graphs • Construct and interpret stem-and-leaf diagrams • **Construct and interpret cumulative frequency diagrams** • **Use cumulative frequency diagrams to find measures** • **Construct and interpret box plots** • Compare distributions using charts and measures • **Compare distributions using complex charts and measures** • Construct and interpret scatter graphs • Draw and use a line of best fit • Understand extrapolation		
12	Non-calculator methods	• Mental/written methods of integer/decimal addition, subtraction, multiplication and division • The four rules of fraction arithmetic • Exact answers • **Rational and irrational numbers (convert recurring decimals here)** • **Understand and use surds** • **Calculate with surds** • Rounding to decimal places and significant figures • Estimating answers to calculations		

		• Understand and use limits of accuracy • **Upper and lower bounds** • Use number sense • Solve financial maths problems • Break down and solve multi-step problems		
13	Type and number sequences	• Understand the difference between factors and multiples • Understand primes and express a number as a product of its prime factors • Find the HCF and LCM of a set of numbers • Describe and continue arithmetic and geometric sequences • Explore other sequences • **Describe and continue sequences involving surds** • Find the rule for the nth term of a linear sequence • **Find the rule for the nth term of a quadratic sequence**		
14	Indices and roots	• Square and cube numbers • Calculate higher powers and roots • Powers of ten and standard form • Laws of indices • Understand the power zero and negative indices • Work with powers of powers • **Understand and use fractional indices** • Calculate with numbers in standard form		
15	Manipulating Expressions	• To understand and use algebraic notation • To solve fractional equations • **To simplify algebraic fractions** • **To calculate with algebraic fractions** • **To solve equations with algebraic fractions** • **To use algebraic proof**		

End of Year Project		• To research and produced a presentation poster on Stephen Hawking. • Understand the barriers he faced during his career.		