KS4 Curriculum Plan Maths FOUNDATION TIER

Year 9		
Autumn Term 1 **Unit 1: Number**	**Topic** **1.1 Calculations** **1.2 Decimal Numbers** **1.3 Place Value** **1.4 Factors & Multiples** **1.5 Squares, Cubes and roots** **1.6 Index Notation** **1.7 Prime Factors**	**Brief description** **Use priority of operations with positive and negative numbers.** **Simplify calculations by cancelling.** **Use inverse operations.** **Round to a given number of decimal place.** **Multiply and divide decimal numbers.** **Write decimal numbers of millions.** **Round to a given number of significant figures.** **Estimate answers to calculations.** **Use one calculation to find the answer to another.** **Recognise 2-digit prime numbers.** **Find factors and multiples of numbers.** **Find common factors and common multiples of two numbers.** **Find the HCF and LCM of two numbers by listing.**
Autumn Term 2 **Unit 2: Algebra**	**2.1 Algebraic expressions** **2.2 Simplifying expressions** **2.3 Substitution** **2.4 Formulae** **2.5 Expanding brackets** **2.6 Factorising** **2.7 Using expressions and formulae** **Unit 3: Graphs, Tables and Charts** **3.1 Frequency tables** **3.2 Two-way tables**	**Find square roots and cube roots.** **Recognise powers of 2, 3, 4 and 5.** **Understand surd notation on a calculator.** **Write a number as the product of its prime factors.** **Use prime factor decomposition and Venn diagrams to find the HCF and LCM.** **Use correct algebraic notation.** **Write and simplify expressions.** **Use the index laws.** **Multiply and divide expressions.** **Substitute numbers into expressions.** **Recognise the difference between a formula and an expression.** **Substitute numbers into a simple formula.** **Expand brackets.** **Simplify expressions with brackets.** **Substitute numbers into expressions with brackets and powers.** **Recognise factors of algebraic terms.** **Factorise algebraic expressions.**

		Use the identity symbol ≡ and the not equals symbol ≠ Write expressions and simple formulae to solve problems. Use maths and science formulae. Designing tables and data collection sheets. Reading data from tables. Use data from tables. Design and use two-way tables.
Spring Term 1 Unit 3: Graphs, Tables and Charts	Topic 3.3 Representing data 3.4 Time series 3.5 Stem and leaf diagrams 3.6 Pie charts 3.7 Scatter graphs 3.8 Line of best fit	Brief description Draw and interpret comparative and composite bar charts. Interpret and compare data shown in bar charts, line graphs and histograms. Plot and interpret time series graphs. Use trends to predict what might happen in the future. Construct and interpret stem and leaf and back-to-back stem and leaf diagrams. Draw and interpret pie charts.
Unit 4: Fractions & Percentages	4.1 Working with fractions 4.2 Operations with fractions 4.3 Multiplying fractions 4.4 Dividing fractions	Plot and interpret scatter graphs. Determine whether or not there is a relationship between sets of data. Draw a line of best fit on a scatter graph. Use the line of best fit to predict values. Compare fractions. Add and subtract fractions.
Spring Term 2 Unit 4: Fractions & Percentages	4.5 Fractions and decimals 4.6 Fractions and percentages 4.7 Calculating percentages 1 4.8 Calculating percentages 2	Use fractions to solve problems. Find a fraction of a quantity or measurement. Use fractions to solve problems. Multiply whole numbers, fractions and mixed numbers. Simplify calculations by cancelling. Divide a whole number by a fraction. Divide a fraction by a whole number or a fraction. Convert fractions to decimals and vice versa. Use decimals to find quantities. Write one number as a fraction of another. Convert percentages to fractions and vice versa.
Unit 5: Equations & Inequalities	5.1 Solving equations 1	

	5.2 Solving equations 2 **5.3 Solving equations with brackets** **5.4 Introducing inequalities** **5.5 More inequalities** **5.6 More formulae**	**Write one number as a percentage of another.** **Convert percentages to decimals and vice versa.** **Find a percentage of a quantity.** **Use percentages to solve problems.** **Calculate simple interest.** **Calculate percentage increases and decreases.** **Use percentages in real-life situations.** **Calculate VAT (value added tax).** **Understand and use inverse equations.** **Rearrange simple linear equations.** **Solve simple linear equations.** **Solve two-step equations.** **Solve linear equations with brackets.** **Solve equations with unknowns on both sides.** **Use correct notation to show inclusive and exclusive inequalities.** **Solve simple linear inequalities.** **Write down whole numbers which satisfy an inequality.** **Represent inequalities on a number line.** **Solve two-sided inequalities.** **Substitute values into formulae and solve equations.** **Change the subject of a formula.** **Know the difference between an expression, an equation, a formula and an identity.**
Summer Term 1 **Unit 6: Angles**	**Topic** **6.1 Properties of shapes** **6.2 Angles in parallel lines** **6.3 Angles in triangles** **6.4 Exterior and interior angles** **6.5 More exterior and interior angles** **6.6 Geometrical patterns**	**Solve geometric problems using side and angle properties of quadrilaterals.** **Identify congruent shapes.** **Understand and use the angle properties of parallel lines.** **Find missing angles using corresponding and alternate angles.** **Solve angle problems in triangles.** **Understand angle proofs about triangles.** **Calculate the interior and exterior angles of regular polygons.** **Calculate the interior and exterior angles of polygons.**

Summer Term 2 **Unit 5c: Sequences** **Unit 7: Statistics – Averages & Range**	**5.7 Generating sequences** **5.8 Using the nth term of a sequence** **7.1 Mean and range** **7.2 Mode, median and range** **7.3 Types of average** **7.4 Estimating the mean** **7.5 Sampling**	**Explain why some polygons fit together and some others do not** **Solve angle problems using equations.** **Solve geometrical problems showing reasoning.** **Recognise and extend sequences.** **Use the nth term to generate terms of a sequence.** **Find the nth term of an arithmetic sequence.** **Calculate the mean from a list and from a frequency table.** **Compare sets of data using the mean and range.** **Find the mode, median and range from a stem and leaf diagram.** **Identify outliers.** **Estimate the range from a grouped frequency table.** **Recognise the advantages and disadvantages of each type of average.** **Find the modal class.** **Find the median from a frequency table.** **Estimate the mean of grouped data.** **Understand the need for sampling.** **Understand how to avoid bias.**
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Year 10		
Autumn Term 1 **Unit 8: Perimeter, Area & Volume 1**	**Topic** **8.1 Rectangles, parallelograms and triangles** **8.2 Trapezia and changing units** **8.3 Area of compound shapes** **8.4 Surface area of 3D solids** **8.5 Volume of prisms** **8.6 More volume and surface area**	**Brief description** **Calculate the perimeter and area of rectangles, parallelograms and triangles.** **Estimate lengths, areas and costs.** **Calculate a missing length, given the area.** **Calculate the area and perimeter of trapezia.** **Find the height of a trapezium given its area.** **Convert between area measures.** **Calculate the perimeter and area of shapes made from triangles and rectangles.** **Calculate areas in hectares, and convert between ha and m2.** **Calculate the surface area of a cuboid.**

Unit 9:Graphs 1	**9.2 Linear graphs**	**Calculate the surface area of a prism.**
	9.3 Gradient	**Calculate the volume of a cuboid.** **Calculate the volume of a prism.**
	9.4 y = mx + c	**Solve problems involving surface area and volume.** **Convert between measures of volume.**
		Generate and plot coordinates from a rule.
Autumn Term 2		**Plot straight-line graphs from**
Unit 9: Graphs 2	**9.5 Real-life graphs**	**tables of values.**
		Draw graphs to represent
	9.6 Distance-time graphs	**relationships.**
		Find the gradient of a line.
	9.7 More real-life graphs	**Identify and interpret the gradient from an equation.**
		Understand that parallel lines have
	10.1 Translation	**the same gradient.**
Unit 10: Transformations		**Understand what m and c**
	10.2 Reflection	**represent in y = mx + c.**
		Find the equations of straight-line graphs.
	10.3 Rotation	**Sketch graphs given the values of m and c.**
	10.4 Enlargement	
	10.5 Describing enlargements	**Draw and interpret graphs from real data.**
		Use distance–time graphs to solve
	10.6 Combining transformations	**problems.** **Draw distance–time graphs.** **Interpret rate of change graphs.** **Draw and interpret a range of graphs.** **Understand when predictions are reliable.**
		Translate a shape on a coordinate grid. **Use a column vector to describe a translation.** **Draw a reflection of a shape in a mirror line.** **Draw reflections on a coordinate grid.** **Describe reflections on a coordinate grid.** **Rotate a shape on a coordinate grid. Describe a rotation.** **Enlarge a shape by a scale factor.** **Enlarge a shape using a centre of enlargement.** **Identify the scale factor of an enlargement.** **Find the centre of enlargement.** **Describe an enlargement.**

		Transform shapes using more than one transformation. Describe combined transformations of shapes on a grid.
Spring Term 1 Unit 11: Ratio & Proportion	Topic 11.1 Writing ratios	Brief description Use ratio notation. Write a ratio in its simplest form.
	11.2 Using ratios 1	Solve problems using ratios. Solve simple problems using ratios.
	11.3 Ratios and measures	Use ratios to convert between units. Write and use ratios for shapes and their enlargements.
	11.4 Using ratios 2	Divide a quantity into 2 parts in a given ratio. Divide a quantity into 3 parts in a given ratio.
	11.5 Comparing using ratios	Solve word problems using ratios. Use ratios involving decimals. Compare ratios.
	11.6 Using proportion	Solve ratio and proportion problems. Use the unitary method to solve proportion problems.
	11.7 Proportion and graphs	Solve proportion problems in words. Work out which product is better value for money.
	11.8 Proportion problems	Recognise and use direct proportion on a graph. Understand the link between the unit ratio and the gradient.
Unit 12: Right-angled Triangles	12.1 Pythagoras' theorem 1	Recognise different types of proportion. Solve word problems involving direct and inverse proportion.
	12.2 Pythagoras' theorem 2	Understand Pythagoras' theorem. Calculate the length of the hypotenuse in a right-angled triangle.
	12.3 Trigonometry: the sine ratio 1	Solve problems using Pythagoras' theorem. Calculate the length of a line segment AB. Calculate the length of a shorter side in a right-angled triangle.
	12.4 Trigonometry: the sine ratio 2	Understand and recall the sine ratio in right-angled triangles. Use the sine ratio to calculate the length of a side in a right-angled triangle.
	12.5 Trigonometry: the cosine ratio	Use the sine ratio to solve problems. Use the sine ratio to calculate an angle in a right-angled triangle.
	12.6 Trigonometry: the tangent ratio	
	12.7 Finding lengths and angles using trigonometry	

Spring Term 2 **Unit 13: Probability**	**13.1 Calculating probability** **13.2 Two events** **13.3 Experimental probability** **13.4 Venn diagrams** **13.5 Tree diagrams** **13.6 More tree diagrams**	**Use the sine ratio to solve problems.** **Understand and recall the cosine ratio in right-angled triangles.** **Use the cosine ratio to calculate the length of a side in a right-angled triangle.** **Use the cosine ratio to calculate an angle in a right-angled triangle.** **Use the cosine ratio to solve problems.** **Understand and recall the tangent ratio in right-angled triangles.** **Use the tangent ratio to calculate the length of a side in a right-anglesd triangle** **Use the tangent ratio to calculate an angle in a right-angled triangle.** **Solve problems using an angle of elevation or depression.** **Understand and recall trigonometric ratios in right-angled triangles.** **Use trigonometric ratios to solve problems.**
Unit 14: Multiplicative Reasoning	**14.1 Percentages** **14.2 Growth and decay** **14.3 Compound measures** **14.4 Distance, speed and time** **14.5 Direct and inverse proportion**	**Know the exact values of the sine, cosine and tangent of some angles.** **Calculate simple probabilities from equally likely events.** **Understand mutually exclusive and exhaustive outcomes.** **Use two-way tables to record the outcomes from two events.** **Work out probabilities from sample space diagrams.** **Find and interpret probabilities based on experimental data.** **Make predictions from experimental data.** **Use Venn diagrams to work out probabilities.** **Understand the language of sets and Venn diagrams.** **Use frequency trees and tree diagrams.** **Work out probabilities using tree diagrams.** **Understand independent events.** **Understand when events are not independent.** **Solve probability problems involving events that are not independent.**

		Calculate a percentage profit or loss. Express a given number as a percentage of another in more complex situations. Find the original amount given the final amount after a percentage increase or decrease Find an amount after repeated percentage change. Solve growth and decay problems. Solve problems involving compound measures. Convert between metric speed measures. Calculate average speed, distance & time. Use formulae to calculate speed and acceleration. Use ratio and proportion in measures and conversions. Use inverse proportions.
Summer Term 1 **Unit 15: Constructions, Loci & Bearings**	**Topic** **15.1 3D solids** **15.2 Plans and elevations** **15.3 Accurate drawings 1** **15.4 Scale drawings and maps** **15.5 Accurate drawings 2** **15.6 Constructions** **15.7 Loci and regions** **15.8 Bearings**	**Brief description** Recognise 3D shapes and their properties. Describe 3D shapes using the correct mathematical words. Understand the 2D shapes that make up 3D objects. Identify and sketch planes of symmetry of 3D shapes. Understand and draw plans and elevations of 3D shapes. Sketch 3D shapes based on their plans and elevations. Make accurate drawings of triangles using a ruler, protractor and compasses. Identify SSS, ASA, SAS and RHS triangles as unique from a given description. Identify congruent triangles Draw diagrams to scale. Correctly interpret scales in real-life contexts. Use scales on maps and diagrams to work out lengths and distances. Know when to use exact measurements and estimations on scale drawings and maps. Draw lengths and distances correctly on given scale drawings. Accurately draw angles and 2D shapes using a ruler, protractor and compasses. Construct a polygon inside a circle. Recognise nets and make accurate drawings of nets of common 3D objects. Draw accurately using rulers and

Summer Term 2 **Unit 16: Quadratic Equations & Graphs**		**compasses.**
	16.1 Expanding double brackets	**Bisect angles and lines using rulers and compasses.**
	16.2 Plotting quadratic graphs	**Draw loci for the path of points that follow a given rule.** **Identify regions bounded by loci to solve practical problems.**
	16.3 Using quadratic graphs	**Find and use three-figure bearings.** **Use angles at parallel lines to work out bearings.**
	16.4 Factorising quadratic expressions	**Solve problems involving bearings and scale diagrams.**
	16.5 Solving quadratic equations algebraically	**Multiply double brackets.** **Recognise quadratic expressions.**
Unit 17: Perimeter, Area & Volume 2	**17.1 Circumference of a circle 1**	**Square single brackets.**
	17.2 Circumference of a circle 2	**Plot graphs of quadratic functions.** **Recognise a quadratic function.**
	17.3 Area of a circle	**Use quadratic graphs to solve problems.** **Solve quadratic equations ax2 + bx + c = 0 using a graph.**
	17.4 Semicircles and sectors	**Solve quadratic equations ax2 + bx + c = k** **Using a graph.**
	17.5 Composite 2D shapes and cylinders	
	17.6 Pyramids and cones	**Calculate the circumference of a circle.** **Solve problems involving the circumference of a circle.**
	17.7 Spheres and composite solids	**Calculate the circumference and radius of a circle.** **Work out percentage error intervals.**
	Revision & Exam Preparation	**Work out the area of a circle.** **Work out the radius or diameter of a circle.** **Solve problems involving the area of a circle.** **Give answers in terms of π.** **Understand and use maths language for circles and perimeters.** **Work out areas of semicircles and quarter circle and perimeters.** **Solve problems involving sectors of circles.** **Solve problems involving areas and perimeters of 2D shapes.** **Work out the volume and surface area of cylinders.** **Work out the volume of a pyramid.**

		Work out the surface area of a pyramid. Work out the volume of a cone. Work out the surface area of a cone. Work out the volume of a sphere. Work out the surface area of a sphere. Work out the volume and surface area of composite solids. Preparation for Y10 GCSE Exam
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Year 11		
Autumn Term 1 **Unit 18: Fractions, Indices & Standard Form** **Unit 19a: Congruence & Similarity** **Autumn Term 2** **Unit 19b: Vectors** **Unit 20: Non-linear Graphs, Simultaneous Equations & Rearranging Formulae**	**Topic** **Y10 GCSE Exam analysis & feedback** **18.1 Multiplying and dividing fractions** **18.2 The laws of indices** **18.3 Writing large numbers in standard form** **18.4 Writing small numbers in standard form** **18.5 Calculating with standard form** **19.1 Similarity and enlargement** **19.2 More similarity** **19.3 Using similarity** **19.4 Congruence 1** **19.5 Congruence 2** **19.6 Vectors 1** **19.7 Vectors 2** **20.1 Graphs of cubic and reciprocal functions** **20.2 Non-linear graphs** **20.3 Solving simultaneous equations graphically** **20.4 Solving simultaneous**	**Brief description** **2 weeks Key topic focus based on question-level analysis of Y10 GCSE Exam** **Multiply and divide mixed numbers and fractions.** **To know and use the laws of indices.** **Write large numbers in standard form.** **Convert large numbers from standard form into ordinary numbers.** **Write small numbers in standard form.** **Convert numbers from standard form with negative powers of ordinary numbers** **To multiply and divide numbers in standard form.** **To add and subtract numbers in standard form.** **Understand similarity.** **Use similarity to solve angle problems.** **Find the scale factor of an enlargement.** **Use similarity to solve problems.** **Understand the similarity of regular polygons.** **Calculate perimeters of similar shapes.** **Recognise congruent shapes.** **Use congruence to work out unknown angles.** **Use congruence to work out unknown sides.** **Add and subtract vectors.** **Find the resultant of two vectors.**

	equations algebraically **20.5 Rearranging formulae** **20.6 Proof** **Revision & Exam Preparation**	**Subtract vectors.** **Find multiples of a vector.** **Draw and interpret graphs of cubic functions.** **Draw and interpret graphs of y = 1/x.** **Draw and interpret non-linear graphs to solve problems.** **Solve simultaneous equations by drawing a graph.** **Write and solve simultaneous equations.** **Solve simultaneous equations algebraically.** **Change the subject of a formula.** **Identify expressions, equations, formulae and identities.** **Prove results using algebra.** **Preparation for December Trial Exam**
Spring Term 1 **Spring Term 2**	**Topic** **December Trial Exam analysis & feedback** **Revision of Key Topics & Past Exam Paper questions** **Revision of Key Topics & Past Exam Paper questions** **Exam preparation**	**Brief description** **Key topic focus based on question-level analysis of December Trial Exam** **Focus on:** **Number** **Algebra** **Ratio & Proportion** **Focus on:** **Geometry** **Probability** **Statistics** **Preparation for March Trial Exam**
Summer Term	**Topic** **March Trial Exam analysis & feedback** **Revision of Key Topics & Past Exam Paper questions** **Exam preparation for June GCSE**	**Brief description** **Key topic focus based on question-level analysis of March Trial Exam**