Mathematic & Numeracy: The Birchwood Way

The Curriculum Journey

	HT1	HT2	HT3	HT4	HT5	HT6
Year 7	Topic 1: **Place Value, Powers & Roots** Learning question: **What are the basic building blocks of Year 7 Mathematics?** Key Knowledge: *Adding, subtracting, multiplying and dividing whole numbers. Adding and subtracting decimals. Place Value. Square roots, Primes, multiples and factors. HCF & LCM. Basic rules of indices.* Topic 2: **Lines, Angles & Shape** Learning question: **How can our basic knowledge of angle facts help us solve problems in 2d shape?** Key Knowledge: *2d Shape. Measuring and constructing angles. Basic angle rules. Angles in triangles and quadrilaterals.*	Topic 1: **Algebraic Manipulation** Learning question: **What are expressions and how can they be manipulated?** Key Knowledge: *Adding, subtracting, multiplying and dividing negative numbers. Forming expressions. Collecting like terms. Substitution. Expanding brackets.* Topic 2: **Data Handling** Learning question: **What is data and how can it be analysed and displayed?** Key Knowledge: Averages and range. Mean from a frequency table. Two way tables. Bar charts & Pictograms. Stem & Leaf diagrams. Time series graphs. Frequency trees.	Topic 1: **Fractions & Decimals** Learning question: **How are fractions and decimals related?** Key Knowledge: *Order of Operations. Ordering fractions and decimals. Multiplying by powers of 10. Types of decimal. Multiplying decimals. Rounding to decimal places. Equivalent fractions. Adding, subtracting, multiplying and dividing fractions. Fractions of amounts.* Topic 2: **Ratio & Percentages** Learning question: **What is proportion?** Key Knowledge: *Simplifying ratio. Sharing with a ratio. Find percentages of amounts with and without a calculator. Common FDP equivalence*	Topic 1: **Equations** Learning question: **What does it mean to 'solve' an equation?** Key Knowledge: *Function machines. Solving equations with one or more steps. Simple rearranging.* Topic 2: **Length, Area & Volume** Learning question: **What is area, surface area and volume?** Key Knowledge: *Perimeter review. Units of measurement. Area and perimeter of rectangles, parallelograms and triangles. Volume and surface area of cuboids.*	Topic 1: **Sequences, Functions and Graphs** Learning question: **What are sequences?** Key Knowledge: *Plotting coordinates. Types of sequences. Finding the next erm in a sequence. nth term. Plot a linear graph using a table of values.* Topic 2: **Transformations** Learning question: **How can we 'transform' a 2d shape?** Key Knowledge: *Line and rotational symmetry. Reflections on a coordinate grid. Rotations on a coordinate grid. Translations using a vector. Simple enlargement.*	Topic 1: **Probability** Learning question: **What is probability and how can it be calculated?** Key Knowledge: *Word probability. The probability scale. Listing outcomes. Sample space diagrams. Venn diagrams. Mutually exclusive events. Use OR for addition.* Topic 2: **Constructions and Loci** Learning question: **How can we accurately construct lines, angles and shapes?** Key Knowledge: *Use a compass to construct circles and arcs. Construct accurate triangles and nets. Explore elevations and isometric drawings.*

Building and revisiting	**Overview:** All topics in Year 7 follow the Key Stage 3 National Curriculum Guidelines, reinforcing and building upon the skills and knowledge developed in Key Stage 2. For many students this will be their first encounter with manipulating and solving Algebraic expressions and Equations, as well as many areas of statistical analysis and probability. Topics and Key Skills are revisited every lesson through Recall 5s.					
	Students reinforce their KS2 knowledge of factors, multiples and prime numbers. They use their basic angle facts to solve more complex problems in shape.	*Students are introduced to the concept of an expression and how these can be manipulated. Their KS2 knowledge of 'averages' is extended to mean, median, mode and together with the range they compare sets of data and display them in a suitable manner.*	*Students build upon their KS2 knowledge of fractions and decimals and gain an increased understanding of percentages. They begin to learn about how FDP are interchangeable. The concept of proportion is introduced through ratio.*	*Students are introduced to the concept of an equation and how they can be 'solved'. Their KS2 knowledge of area and volume is reinforced through work with 2d shape and cuboids. They begin to solve angle, area and perimeter problems with algebra.*	*Students are introduced to different types of sequences and find the nth term of a linear sequence. They are introduced to simple linear sequences and how they can be represented graphically. They further their KS2 knowledge of transformations, applying them to a coordinate grid.*	*Students are introduced to the probability scale in both word form and as fractions, decimals and percentages. They use diagrams to represent probability and are introduced to the concept of OR and Mutually Exclusive events. They further their KS2 protractor skills, using a set of compasses and a ruler to construct accurate drawings.*
Assessment	RAP x 1: Place Value, Powers & Roots 15 Skills Retrieval Test in final week Initial Baseline Test Week 2	RAP x 2: Algebraic Manipulation Data Handling 15 Skills Retrieval Test in final week	RAP x 1: Fractions & Decimals 15 Skills Retrieval Test in final week Mid Year KASTs	RAP x 2: Ratio & Percentages Equations 15 Skills Retrieval Test in final week	RAP x 2: Sequences, Functions and Graphs Transformations 15 Skills Retrieval Test in final week	RAP x 1: Probability 15 Skills Retrieval Test in final week End of Year KASTs

	HT1	HT2	HT3	HT4	HT5	HT6
Year 8	Topic 1: **Place Value, Powers & Roots** Learning question: **How do we represent very large and very small numbers?** Key Knowledge: *Rules of indices with numbers and variables. Standard form.* Topic 2: **Lines, Angles & Shape** Learning question: **How can we calculate angles on parallel lines and in regular polygons?** Key Knowledge: *Angles on parallel lines. Names of polygons. Interior and exterior angles of regular polygons.*	Topic 1: **Algebraic Manipulation** Learning question: **What is factorisation and expansion?** Key Knowledge: *Substitution, Collecting like terms. Expanding single and double brackets. Factorising a bracket using a common factor.* Topic 2: **Data Handling** Learning question: **Can you analyse and display data appropriately?** Key Knowledge: Averages and range from frequency tables. Draw and interpret pie charts. Draw and interpret scatter graphs. Correlation.	Topic 1: **Fractions & Decimals** Learning question: **How do we calculate with Mixed Numbers?** Key Knowledge: *Order of Operations, Multiplying and dividing decimals. Ordering fractions. Fractions of amounts. Reciprocals. Add, subtract, multiply and divide mixed numbers.* Topic 2: **Ratio & Percentages** Learning question: **How do we change a value by a percentage using a decimal multiplier?** Key Knowledge: Simplifying ratio. Best Value. Percentages of amounts using a calculator. Increasing and decreasing using a percentage multiplier.	Topic 1: **Equations** Learning question: **What are the similarities between solving and rearranging?** Key Knowledge: Topic 2: **Length, Area & Volume** Learning question: **How do we calculate the circumference and area of circles?** Key Knowledge: Area review. Converting between metric units. Compound area. Circle parts. Area and circumference of a circle.	Topic 1: **Sequences, Functions and Graphs** Learning question: **What are the characteristics of linear graphs?** Key Knowledge: Plotting points. nth term. Specia sequences. Plotting linear graphs from a table of values and using y = mx + c. Topic 2: **Transformations** **Learning question:** **What information do we need to transform shapes on a coordinate grid?** Key Knowledge: Reflection, Rotation, Translation and Enlargement (positive scale factor) on a coordinate grid.	Topic 1: **Probability** Learning question: **What are independent and mutually exclusive events?** Key Knowledge: Simple Venn diagrams. Relative frequency. Basic probability trees. Topic 2: **Pythagoras** Learning question: **What is the relationship between the sides of right angled triangles?** Key Knowledge: The Pythagorean Theorem.
Building and revisiting	**Overview:** The topics studied in Year 8 are identical to those in year 7 and build upon the KS2 skills reinforced and the new knowledge introduced in Year 7. In Year 8 students are introduced to topics such as angles in parallel lines, interior and exterior angles of regular polygons, factorising, area and circumference of a circle and pie charts for the first time. Classes follow the same curriculum but are taught in mixed ability Foundation and Higher classes with extension topics for the higher classes. Topics and Key Skills are revisited every lesson through Recall 5s and through retrieval SPARX homework..					
	Students use their knowledge of the rules of indices and place value developed in Year 7 to work with standard	*Students review the manipulation of expressions from Year 7 and are introduced to the concept of*	*Students advance their fractions skills by working with mixed numbers. They are introduced to the concept*	*Students continue to solve more complex equations involving one variable and learn how to change the*	*Students compare different types of sequences and develop their understanding of nth term. They plot linear*	*Students develop their understanding of mutually exclusive and independent events through the use of*

	form. They develop their knowledge of angles facts from KS2 to include those on parallel lines and within regular polygons.	*factorisation. They continue to analyse data from frequency tables and are develop their knowledge to construct more complicated Pie Charts. They are introduced to Scatter graphs and correlation.*	*of a reciprocal and further their understanding of the Order of Operations. They continue to develop their understanding of ratio and percentage from year 7 solving more complex ratio questions. They use proportion to solve 'Best Value' questions and begin to use a decimal multiplier to manipulate values.*	*subject of an equation or formula. They develop their knowledge of the area of 2d shape by finding compound area. They learn about the parts of a circle and begin to calculate area and circumference of whole and semi-circles.*	*graphs using a table of values and also using the characteristics of linear graphs. They continue to investigate the concepts of rotation, reflection and translations and extend their knowledge of enlargement to include a point of enlargement.*	*probability trees. They find probabilities from Venn diagrams and explore relative frequency and the concept of experimental probability. Students are introduced to the concept of The Pythagorean Theorem in right angled triangles.*
Assessment	RAP x 2: Place Value, Powers & Roots Lines, Angles & Shape 15 Skills Retrieval Test in final week Key Skills Test Week 2	RAP x 1: Data Handling 15 Skills Retrieval Test in final week	RAP x 1: Fractions & Decimals 15 Skills Retrieval Test in final week Mid Year KASTs	RAP x 3: Ration & Percentages Equations Length, Area & Volume 15 Skills Retrieval Test in final week	RAP x 1: Sequences, Functions and Graphs 15 Skills Retrieval Test in final week	RAP x 1: Probability 15 Skills Retrieval Test in final week End of Year KASTs

	HT1	HT2	HT3	HT4	HT5	HT6
Year 9 Foundation	Topic 1: **Place Value, Integers, Decimals, Powers and Roots** Learning question: **What are the rules when working with indices?** Key Knowledge: 4 rules with negative numbers and decimals. Rounding to decimal places and significant figures. Estimation. Laws of indices. Topic 2: **Powers and Standard Form** Learning question: **How do we represent really large and really small numbers?** Key Knowledge: Converting between ordinary numbers and standard form. Multiplying and dividing with standard form. Prime factor decomposition. LCM and HCF	Topic 1: **Algebraic Manipulation** Learning question: **How do we expand and factorise?** Key Knowledge: Consolidation of manipulation of algebraic expressions including combining like terms, expanding brackets, common factor factorising, substitution and expanding double brackets. Topic 2: **Lines, Angles and Shapes** Learning question: **What is the relationship between interior and exterior angles in polygons?** Key Knowledge: Consolidation of missing angles in triangles, quadrilaterals, parallel lines and polygons.	Topic 1: **Fractions & Percentages** Learning question: **How can I find percentages and fractions of amounts?** Key Knowledge: Consolidation of 4 rules with mixed numbers. Converting between FDP. Percentages and fractions of amounts. Percentage increase and decrease. Percentages in context. Topic 2: **Ratio & Proportion** Learning question: **How can ratio be used to solve problems?** Key Knowledge: Simplifying and calculating with ratio. Map scales. Exchange rates.	Topic 1: **Equations** Learning question: **What is an equation?** Key Knowledge: Identifying expressions, equations, identities and formulae. Function machines to write equations, Solve equations with 2 steps and the variable on both sides of the equation. Form and solve equations. Change the subject of an equation or formula. Topic 2: **Length, Area & Volume** Learning question: **How can I find the surface area and volume of prisms?** Key Knowledge: Consolidation of area and perimeter including circles. Volume of cuboids, prisms and cylinders.	Topic 1: **Statistics 1** Learning question: **How can I collect, analyse and display data?** Key Knowledge: Types of data. Sampling methods. Averages and range. Bar charts, pictograms and stem and leaf diagrams. Reading tables, charts and timetables. Scatter graphs. Spearman's Rank. Frequency polygons. Time series graphs. Moving averages.	Topic 1: **Probability** Learning question: **How can I work with probability in real life situations?** Key Knowledge: Listing outcomes. Mutually exclusive events. Sample space diagrams. Relative frequency and expectation. Frequency tree. Probability trees and Venn diagrams. Topic 2: **Transformations** Learning question: **How can I change a 2 dimensional shape?** Key Knowledge: Reflection, Rotation, translation and enlargement.
Building and revisiting	**Overview:** The topics in the Year 9 Foundation curriculum follow a similar pattern to years 7 and 8 and aim to consolidate all the skills learned so far and extend to more complex questions, algebra and real life situations. Year 9 sets the foundation for the GCSE curriculum in year 10. Additionally, all students will begin to study for the GCSE Statistics examination they will take in the Summer of Year 10. Topics and Key Skills are revisited every lesson through Recall 5s and through retrieval SPARX homework.					
	Students consolidate their knowledge of place value, decimals, powers and root	*Students consolidate their understanding of the basic manipulation of algebra from*	*Students consolidate their understanding of the 4 rules of number with mixed*	*Students explore the difference between expressions, equations,*	*Students begin to study for the GCSE Statistics examination. They*	*Students explore the probability topics from the GCSE Statistics curriculum*

	from Year 7&8 using index laws with both numbers and variables. They apply their knowledge of these in order to multiply and divide with standard form and find the HCF and LCM of two or more numbers.	*Year 7&8 working with more complex questions. They use their knowledge of angle rules to calculate missing angles in a variety of circumstances and interleave their algebra skills in order to solve problems.*	*numbers and fractions. Students find fractions and percentages of amounts with and without a calculator and begin to explore percentages in context. They use their knowledge of ratio to work with scale drawings, recipes and exchange rates. They begin to explore the concept of inverse proportion.*	*identities and Formulae. They continue to solve linear expressions involving more complex questions and change the subject of a formula where the variable subject is in the denominator. They develop their understanding of the volume of a cuboid to calculate the volume of a prism or cylinder.*	*investigate what types of data exist, how it can be collected, displayed and analysed. They develop the skills learned in Year 7&8 and are introduces to the estimated averages from grouped data, interpolation, extrapolation, Spearman's Rank, Frequency Polygons and Moving Averages.*	*deepening their understand of the concepts developed in year 7&8 as well as exploring frequency trees and probability trees for dependent events. They consolidate their knowledge of transformations on a coordinate grid.*
Assessment	RAP x 1: Place Value, Integers, Decimals, Powers and Roots Standard Form 15 Skills Retrieval Test in final week Key Skills Test Week 2	RAP x 1: Algebra 15 Skills Retrieval Test in final week	RAP x 1: Fractions & Percentages 15 Skills Retrieval Test in final week Mid Year KASTS	RAP x 1: Equations 15 Skills Retrieval Test in final week	RAP x 2: Data and Sampling 15 Skills Retrieval Test in final week	RAP x 1: Probability 15 Skills Retrieval Test in final week End of Year Assessment 1 x Calculator Paper 1 x Non-Calc Paper

	HT1	HT2	HT3	HT4	HT5	HT6
Year 9 Higher	Topic 1: **Place Value, Integers, Decimals, Powers and Roots** Learning question: **What do negative and fractional indices represent?** Key Knowledge: Multiply and divide decimals. Rounding and Truncation. Estimation. Laws of indices including fractions and negative numbers. Topic 2: **Factors, Multiples, Standard Form & Surds** Learning question: **What is a surd?** Key Knowledge: Consolidation of prime factor compositions, HCF and LCM. 4 Rules with standard form. Simplifying and multiplying surds.	Topic 1: **Algebraic Manipulation** Learning question: **How can I change the subject of an equation or formula?** Key Knowledge: Consolidation of manipulation of algebraic expressions expansion and factorisation. Factorising quadratics including difference of 2 squares. Change the subject of a formula with the variable on both sides. Solve simple linear simultaneous equations. Topic 2: **Sequences, Functions and Graphs** Learning question: **What is a recurrence relationship?** Key Knowledge: Consolidation of linear nth term. Quadratic sequences. Fibonacci and geometric sequences. Topic 3: **Ratio & Proportion**	Topic 1: **Fractions & Percentages** Learning question: **What is interest and depreciation?** Key Knowledge: Consolidation of 4 rules with mixed numbers, converting between FDP, percentages and fractions of amounts. Convert between recurring decimals and fractions. Reverse percentages. Compound interest and depreciation. Topic 2: **Angles** Learning question: **How can I solve angle problems in polygons?** Key Knowledge: Consolidation of angles in shapes and on parallel lines. Topic 3: **Area Review** Learning question: **How do I calculate the area of a compound shape?** Key Knowledge: Consolidation of area and permitter. Area of a	Topic 1: **Pythagoras** Learning question: **How are the sides of right angles triangles related?** Key Knowledge: The Pythagorean theorem Midpoint and plotting coordinates. Length of a line segment. Topic 2: **Circles** Learning question: **How do I calculate the area of sectors and length of arcs?** Key Knowledge: Consolidation of area and circumference of circles. Arc length. Area of sectors. Topic 3: **Linear Graphs** Learning question: **How can I find the equation of a linear graph given two coordinates on the line?** Key Knowledge: Consolidation of plotting linear graphs. Gradient equation. Find the equation of a line given information.	Topic 2: **The Data Cycle** Learning question: **How can I collect, analyse and display data?** Key Knowledge: Types of data. Sampling. Capture-recapture. Averages and range from a list. Stem and leaf. Quartiles and IQR. Averages from a table. Linear interpolation. Presenting data. Scatter Graphs. Pie Charts. Correlation and line of best fit. Time series graphs.	Topic 1: **Probability** Learning question: Can I use probability to predict real events? Key Knowledge: Consolidation of basic probability. Two way tables. Frequency trees. Product rule for counting. Relative frequency. Sample space diagrams. Probability trees. Set notation. Venn diagrams. Conditional probability. Topic 2: **Transformations** Learning question: **What is invariance?** Key Knowledge: Reflection, Rotation, translation and enlargement. Invariance. Negative and fractional enlargement.

		Learning question: **How can ratio be used to solve complex problems?** Key Knowledge: Consolidation of ratio. Map scales. Exchange rates.	trapezium. Convert between metric units. Compound shapes.	Find parallel and perpendicular lines.		
Building and revisiting	**Overview:** The topics in the Year 9 Higher curriculum follow a similar pattern to years 7 and 8 and aim to consolidate all the skills learned so far and extend to more complex questions, algebra and real life situations. Year 9 sets the foundation for the GCSE curriculum in year 10. Students are introduced to Surds and more complex percentages problems, as well as the nth term of quadratic sequences and more complex linear equations topics. Additionally, all students will begin to study for the GCSE Statistics examination they will take in the Summer of Year 10. Topics and Key Skills are revisited every lesson through Recall 5s and through retrieval SPARX homework..					
	Students consolidate prior learning with place value, powers and roots and work with fractional and negative indices. They use their knowledge of indices rules to add, subtract, multiply and divide standard form. Students are introduced to the concept of a surd, simplifying and multiplying them.	*Students consolidate their knowledge of solving linear equations and changing the subject of an equation. They develop their knowledge of linear nth term to find the nth term quadratic sequences. Students use their knowledge of ratio and proportion to solve problems with maps scales, exchange rates and more complex ratio problems in context. Students solve simple linear simultaneous equations.*	*Students consolidate their knowledge of fractions and percentages from Year 7&8, converting between fractions and recurring decimals, finding reverse percentages and calculating interest and depreciation. They use their angles knowledge to calculate missing angles in a variety of shapes and situations including the use of algebra.*	*Students consolidate their knowledge of area of shapes and find the area and perimeter of compound shapes including trapeziums. They convert between metric units of area. Students develop their work on Pythagoras from Year 8 and use it to calculate the length of a line segment. Students use their knowledge of area and circumference of a circle to find arc lengths and the area of sectors.*	*Students consolidate their knowledge of linear graphs and begin to be able to name graphs given points on the graph, the gradient and/or the y-intercept. Students begin to study for their GCSE Statistics Examinations reviewing statistics and probability topics from years 7&8 as well as being introduced to concepts such as quartiles, IQR, Linear Interpolation and the equation for a line of best fit.*	*Students review their probability work from Year 7&8 and extend their knowledge to understand set notation and conditional probability as well as the product rule for counting. They consolidate their understanding of transformations, combining single transformations, and introduced to the concept of invariance.*
Assessment	RAP x 1: Indices 15 Skills Retrieval Test in final week Key Skills Test Week 2	RAP x 1: Algebraic Manipulation 15 Skills Retrieval Test in final week	RAP x 1: Percentages 15 Skills Retrieval Test in final week Mid Year KASTS	RAP x 1: Pythagoras 15 Skills Retrieval Test in final week	RAP x 1: Data 15 Skills Retrieval Test in final week	RAP x 1: Probability 15 Skills Retrieval Test in final week End of Year KAST 1 x Calculator Paper 1 x Non-Calc Paper

	HT1	HT2	HT3	HT4	HT5	HT6
Year 10 Foundation	Topic 1: **Fractions, Decimals and Percentages** Learning question: **What is interest and depreciation?** Key Knowledge: 4 rules with mixed numbers. Fractions of amounts. Order FDP. Find percentages of amounts with and without a calculator. Use a decimal multiplier to increase and decrease by a percentage. Find reverse percentages. Interest and depreciation. Topic 2: **Algebraic manipulation** Learning question: **How can solve a quadratic equation by factorising?** Key Knowledge: Consolidation of algebraic manipulation. Substitute into expressions with brackets and indices. Expansions and factorisation. Factorise quadratics. Solve quadratics by factorising.	Topic 1: **Shape, Area & Volume** Learning question: **What is congruency and similarity in shape?** Key Knowledge: Area and perimeter. Area of trapeziums. Convert between metric units of area and volume. Nets. Surface area and volume of prisms. Identify congruent and similar shapes. Topic 2: **Pythagoras** Learning question: **How are the sides of right angled triangles related?** Key Knowledge: Estimate and find square roots. The Pythagorean Theorem. Topic 3: **Volume and Area** Learning question: **How do I calculate the area of a sector?** Key Knowledge: Area and circumference of circles. Area of a sector. Volume and surface area of	Topic 1: **Equations & Inequalities** Learning question: **How do you solve equations with inequalities?** Key Knowledge: Consolidation of solving and rearranging equations. Representing inequalities on a number line. Solving inequalities. Error interval and truncation. Solve simultaneous equations. Topic 2: **Sequences and nth term** Learning question: **What are the characteristics of quadratic and geometric sequences?** Topic 3: **New Statistics** Learning question: **How are cumulative frequency graphs and box-plots related?** Key Knowledge: Index numbers. RPI, CPI and GDP. Rates of change. Cumulative frequency Curves. Boxplots. Outliers and skew.	Topic 1: **Analysing Data (Stats Revision)** Learning question: **How do you calculate averages from tables?** Key Knowledge: Averages from tables. Two way tables. Scatter graphs. Correlation. Frequency polygons. Time series graphs. Moving averages. Topic 2: **Probability (Stats Revision)** Learning question: **Is probability an accurate way to predict events?** Key Knowledge: Listing outcomes. Mutually exclusive events. Sample space diagrams. Relative frequency and expectation. Frequency tree. Probability trees and Venn diagrams. Topic 3: **Linear Graphs** Learning question: **What is the general equation of a linear graph?** Key Knowledge:	**GCSE Stats Revision & Exam Practice**	**GCSE STATS EXAM** Topic 1: **Constructions and Loci** Learning question: **How can constructions help to solve real life problems?** Key Knowledge: Constructing triangles, angles and bisectors. Loci. Scale drawings. Bearings. Elevations. Isometric drawings.

		cylinders, cones, pyramids and spheres.	Key Knowledge: Consolidation of nth term of linear sequences. Nth term from diagrams. Use a formula to find the terms of a quadratic sequence. Geometric sequences.	Midpoints. Horizontal and vertical graphs. Plot linear graphs using a table. Find the gradient of a line. The general equation of a line. Parallel lines.		
Building and revisiting	**Overview:** Year 10 is the beginning of the GCSE Curriculum for all students and builds upon the foundations built in KS3. Additionally, all students will complete their course of study for the GCSE Statistics examination they take in the Summer. Topics and Key Skills are revisited every lesson through Recall 5s and through retrieval SPARX homework..					
	Students consolidate their understanding of how FDP are linked and use a decimal multiplier to increase and decrease an amount by a given percentage. They find percentage change, reverse percentages, interest and depreciation. They further consolidate their algebra skills from KS2 and explore the link between factorising and expanding. They factorise and solve simple quadratic equations.	*Students consolidate their KS2 knowledge of area, perimeter and volume. They calculate the area and volume of more complex shapes and explore the nets and characteristics of simple 3d shapes. They identify congruent and similar shapes. Students revisit their work on Pythagoras from Year 8 and solve questions in context.*	*Students are introduced to the concept of inequalities and apply their understanding of how to solve an equation to them. They represent inequalities on a number line and solve simple simultaneous equations. Students continue to work with linear sequences and nth term and use the nth term of a quadratic sequence to find the terms in the sequence. They are introduced to the concept of a geometric sequence and explore Fibonacci sequences.*	*Students are introduced to the concept of Skew, index numbers, RPI, CPI and GDP. They plot and interpret cumulative frequency polygons and explore the relationship between these and boxplots. They begin to consolidate the Statistics knowledge gained in Year 9 and 10 in advance of their GCSE Statistics examination.*	*Students consolidate their data and probability knowledge gained in the last 4 years in order to revise for their GCSE Statistics Examination and sit a mock exam preparation.*	*Students sit their GCSE Statistics examination. Students will further their understanding of linear graphs calculating the gradient of a line, given two coordinate and using y = mx + c to draw and name lines. They will identify parallel lines from the equation of a line. Students further explore the construction of common shapes and angles and use these skills to draw Loci. They work with maps and scales and draw accurate drawings of 3d shapes using isometric paper as well as elevations.*
Assessment	RAP x 1: FDP Review 15 Skills Retrieval Test in final week	RAP x 1: Pythagoras 15 Skills Retrieval Test in final week	RAP x 2: Equations and inequalities Linear Graphs 15 Skills Retrieval Test in final week Mid Year KASTS	15 Skills Retrieval Test in final week Mock Examination	15 Skills Retrieval Test in final week Marked and self marked past papers	15 Skills Retrieval Test in final week GCSE Stats Exam End of Year Assessment

	HT1	HT2	HT3	HT4	HT5	HT6
Year 10 Higher	Topic 1: **Compound measures** Learning question: **What are compound measures?** Key Knowledge: Speed. Density. Pressure. Topic 2: **Solving quadratics and inequalities** Learning question: **How can I solve quadratic equations?** Key Knowledge: Represent inequalities on a number lines. Solve inequalities. Upper and lower bounds. Solve quadratics by factorising, completing the square and using the quadratic formula. Topic 3: **Congruent and Similar Shapes** Learning question: **What is similarity and congruence?**	Topic 1: **Trigonometry** Learning question: **What is the relationship between the angles and sides of right angled triangles?** Key Knowledge: Consolidation of Pythagoras and trig with right angled triangles. Trig graphs. Know exact trig values. Topic 2: **New Stats 1** Learning question: **What is the relationship between cumulative frequency graphs and box-plots.** Key Knowledge: Consolidation of probability. Binomial distribution. IQR. Cumulative frequency. Boxplots. Topic 3: **New Stats 2** Learning question: **What is standard deviation?**	Topic 1: **New Stats 3** Learning question: **What is the difference between a bar chart and a histogram?** Key Knowledge: Skewness. Histograms. Topic 1: **New Stats 4** Learning question: **What is a Normal Distribution?** Key Knowledge: Choropleth Maps. Spearman's Rank. Moving averages. Seasonal variation. Normal distributions. Standardised scores. Quality assurance and control charts	Topic 1: **Volume and Surface Area** Learning question: **How can I calculate the volume and surface area of prisms and pyramids?** Key Knowledge: Surface area and volume of prisms, cylinders, pyramids, cones, frustrums, spheres and hemispheres. Topic 2: **Surds** Learning question: **How do you rationalise a denominator?** Key Knowledge: Consolidation of surds. Rationalising the denominator.	Topic 1: **Proportion** Learning question: **What is direct and indirect proportion?** Key Knowledge: Direct and inverse proportion. Topic 2: **Algebraic Fractions** Learning question: **What are the rules for working with algebraic fractions?** Key Knowledge: Manipulating and solving algebraic fractions. Topic 3: **Vectors** Learning question: **What is the difference between a column vector and vector geometry?** Key Knowledge: Column vectors. Vector geometry.	**GCSE Stats Revision & Exam Practice** Topic 1: **Circle Theorems** Learning question: **What are the relationships between angles formed in circles?** Key Knowledge: Circle theorems. Topic 2: **Construction and Loci** Learning question: **How can constructions help to solve real life problems?** Key Knowledge: Constructing triangles, angles and bisectors. Loci. Scale drawings. Bearings. Elevations. Isometric drawings.

	Key Knowledge: Congruent and similar triangles. Solve problems with similar shapes including 3d. Topic 4: **Real life graphs** Learning question: **What are the characteristics of velocity and speed graphs?** Key Knowledge: Real life graphs Distance time graphs. Velocity time graphs.	Key Knowledge: Geometric and weighted mean. Standard deviation of discrete data. Chain based index numbers. RPI, CPI and GDP. Rates of change. Population pyramids.			**GCSE Stats Revision & Exam Practice**	
Building and revisiting	**Overview:** Year 10 is the beginning of the GCSE Curriculum for all students and builds upon the foundations built in KS3. Additionally, all students will complete their course of study for the GCSE Statistics examination they take in the Summer. Topics and Key Skills are revisited every lesson through Recall 5s and through retrieval SPARX homework.					
	Students are introduced to the concept of compound measures and study speed, density and pressure. They develop their knowledge of solving equations using factorisation, completing the square and the quadratic formula to solve quadratic equations. They further investigate what it is to be congruent and similar using rules for triangles and in 3d shape. Students study real life graphs including distance/time graphs and velocity/time graphs.	*Students review Pythagoras and are introduced to the concept of trigonometric ratios in right angled triangles. They sketch trigonometric graphs and memorise exact trig values. Students further their statistics knowledge, studying topics such as Binomial distributions, Cumulative frequency, boxplots, outliers, geometric and weighted mean and chain based index numbers. They are introduced to the concept of standard deviation and use it to analyse data.*	*Students continue to work on statistics and are introduced to topics such as Population Pyramids, Histograms, Choropleth Maps, Spearman's Rank, PMCC and SRCC, Moving averages, Normal Distributions, Standardised scores and Quality assurance.*	*Students convert between metric units of volume and calculate the volume and surface area of prisms, pyramids, cylinders, cones, frustums, spheres and hemispheres. They review their work on surds from year 9 and use it to rationalise the denominator of a fraction.*	*Students investigate the concepts of direct and inverse proportion. They work with fractions that involve algebra simplifying, multiplying, dividing, adding and subtracting them. The solve algebraic fractions and begin to revise for their GCSE Statistics examination.*	*Students sit their GCSE Statistics examination. They work use column vectors diagrammatically and calculate with them. Students are introduced to Circle theorems and use them to solve contextual problems including algebra. Students use mathematical tools to construct accurate drawing and use loci to solve real life problems. They draw scale drawings, isometric drawing and elevations.*

Assessment	RAP x 1: Solving quadratics 15 Skills Retrieval Test in final week	RAP x 1: Boxplots and CF Curves 15 Skills Retrieval Test in final week	15 Skills Retrieval Test in final week Mid Year KASTS	RAP x 1: Surds 15 Skills Retrieval Test in final week Mock Examination	RAP x1: Vectors 15 Skills Retrieval Test in final week Marked and self marked past papers	GCSE Stats Exam 15 Skills Retrieval Test in final week End of Year Assessment

	HT1	HT2	HT3	HT4	HT5	
Year 11 Foundation	Topic 1: **Ratio, Proportion and Compound Measures** Learning question: **What are compound measures?** Key Knowledge: Consolidation of order of operations and Ratio. Best buys. Speed. Distance and velocity time graphs. Pressure. Density. and depression. Exact Trig values. Topic 2: **Vector Notation** Learning question: **What do column vectors represent?** Key Knowledge: Column vector notation. Adding and subtracting column vectors. Multiplying vectors by a scalar.	Topic 1: **Quadratic and Cubic Graphs** Learning question: **What are the characteristics of quadratic and cubic graphs?** Key Knowledge: Plot quadratic graphs. Characteristics of quadratics graphs. Cubic and reciprocal graphs. Topic 2: **Simultaneous equations** Learning question: **How do I solve equations with 2 variables?** Key Knowledge: Simultaneous equations. Topic 3: **Congruence, Similarity and Transformations** Learning question: **What makes shapes congruent?** Key Knowledge: Congruent shapes. Similar shapes and triangles. Reflection, Rotation, Enlargement and Transformation.	**Revision and Exam Practice**	**Revision and Exam Practice**	**GCSE Maths Exam**	**GCSE Maths Exam**

		Topic 4: **Pythagoras & Trigonometry** Learning question: **How are the angles and sides of right angled triangles related?** Key Knowledge: Pythagoras in context. Trigonometric ratios in right angled triangles. Elevations				
Building and revisiting	**Overview:** In Year 11, students complete their study for the GCSE Mathematic curriculum and begin a course of revision and exam practice. Their revision curriculum is set but adapted according to the QLA undertaken after each mock examination. Topics and Key Skills are revisited every lesson through Recall 5s and through retrieval SPARX homework.					
	Students consolidate their understanding and ratio and proportion and explore compound measure of speed, density and pressure. They use and calculate with column vectors.	*Students explore the shape and characteristics of quadratic, cubic and reciprocal graphs and plot them using a table of values. They consolidate their knowledge of transformations and calculate missing sides and angles of right angled triangles.*	*Students follow a revision and exam practice course of study ahead of their GCSE exam.*	*Students follow a revision and exam practice course of study ahead of their GCSE exam.*	*Students sit their GCSE Mathematics Examination*	
Assessment	RAP x 1 Compound Measures Mock Examination	RAP x 1 Congruence & Similarity	Marked and self marked past papers	Marked and self marked past papers Mock Examination		

	HT1	HT2	HT3	HT4	HT5	HT6
Year 11 Higher	Topic 1: **Further Trigonometry** Learning question: **What is the relationship between angles and sides of triangles that are not right-angled?** Key Knowledge: Sine rule. Cosine rule. Trig and Pythagoras in 3d shape. Area of a triangle. Topic 2: **Further Graphs** Learning question: **How can I recognise the equation of a graph from its shape?** Key Knowledge: Quadratic cubic and reciprocal graphs. Graphs of circles. Inequality regions. Iteration. Solve simultaneous equations graphically. Expand triple brackets.	Topic 1: **Functions** Learning question: **What is a function?** Key Knowledge: Algebraic proof. Function notation. Inverse and composite functions. Topic 2: **Circle Tangents** Learning question: **How can I find the equation of a line that is a tangent to a circle?** Key Knowledge: Equations of a tangent to a circle. Topic 3: **Transforming Graphs, Gradient and Area Under Curves** Learning question: **How can the graph of a function be transformed?** Key Knowledge: Exponential graphs and equations. Estimate area under a curve. Estimate the gradient at a point on a curve. Rate of change.	**Revision and Exam Practice**	**Revision and Exam Practice**	**GCSE Maths Exam**	**GCSE Maths Exam**

		Topic 4: **Construction and Loci** Learning question: **How can constructions help to solve real life problems?** Key Knowledge: Constructing triangles, angles and bisectors. Loci. Scale drawings. Bearings. Elevations. Isometric drawings.				
Building and revisiting	**Overview:** In Year 11, students complete their study for the GCSE Mathematic curriculum and begin a course of revision and exam practice. Their revision curriculum is set but adapted according to the QLA undertaken after each mock examination. Topics and Key Skills are revisited every lesson through Recall 5s and through retrieval SPARX homework.					
	Students extend their understanding of triangle trigonometry to those which are not right angled. They use the sine and cosine rules to calculate sides and angles including those in 3d shapes. Students study real life graphs including distance/time graphs and velocity/time graphs. Students study and plot quadratic, cubic and reciprocal graphs. They are introduced to iterations.. Students sketch simple graphs of circles and extend their understanding of inequalities to include linear and quadratic inequalities and their regions. Students expand triple brackets and solve linear and quadratic	*Students complete their GCSE course studying functions. They are introduced to exponential graphs and the concept of the transformation of graphs. They calculate an estimate for the area under a curve and the gradient at a point on a curve. They further their knowledge of the equation of a circle by calculating tangents to a point on a circle. Students use mathematical tools to construct accurate drawing and use loci to solve real life problems. They draw scale drawings, isometric drawing and elevations.*	*Students follow a revision and exam practice course of study ahead of their GCSE exam.*	*Students follow a revision and exam practice course of study ahead of their GCSE exam.*	*Students sit their GCSE Mathematics Examination*	

	simultaneous equation both algebraically and graphically.					
Assessment	RAP x 1 Further Trig Mock Examination	RAP x 1 Functions	Marked and self marked past papers	Marked and self marked past papers Mock Examination		