Mathematics Curriculum Map

Year 7						
	Learning Period 1: Autumn	**Learning Period 2: Autumn**	**Learning Period 3: Spring**	**Learning Period 4: Spring**	**Learning Period 5: Summer**	**Learning Period 6: Summer**
Topic title	Making generalisations about the number system	Making generalisations about the number system (2)	2D Geometry	2D geometry	Fractions and percentages	Ratio and proportion
Key questions	What number bases do we use on a daily basis? What is the relationship between multiplication and division? What is the difference between a factor and a multiple? What is BIDMAS and why is it important?	How do I calculate with negative numbers? How can I use algebra to generalise ideas? What is balancing and how do I use it to solve equations?	How do I use a protractor to measure and draw angles? How can I use angle facts to find missing angles? How can I use mathematical equipment to construct triangles and quadrilaterals accurately?	How can I use co-ordinates to identify points on a grid? How can I use mathematical formulae to calculate area of different shapes? How can I transform shapes around a grid?	How do I use a Venn diagram to find the HCF and LCM of two or more numbers? How can I use the equivalence of fractions to convert between different forms? How can I use equivalence to add and subtract fractions with different denominators?	What is ratio and how do I represent it using a diagram? How can I use the Singapore bar model to solve problems involving ratio? What is the relationship between fractions, decimals and percentages? How can I convert a percentage in to a decimal multiplier?

Key knowledge/concepts and skills	**Numbers and numerals** Place value and understanding of time as a different base system **Recognising patterns with multiplication** Multiplication – introduction of the Napier's bones grid as an alternative to long multiplication. Division methods. Understanding the relationship between multiplication and division **Factors and multiples** Being able to identify different types of numbers, such as factors, multiples, squares and primes. Finding highest common factor and lowest common multiple of two numbers by listing. Writing a number as a product of primes **Order of operations** Know the importance of BIDMAS and be able to apply it to different calculations.	**Positive and negative numbers** Ordering positive and negative numbers. Performing the 4 operations with negative numbers. **Introducing sequences, expressions and equations** Forming algebraic expressions. Simplifying algebraic expressions. Expanding single brackets. Solving one and two step equations	**Angles** Estimating angles. Drawing angles using a protractor. Using basic angle fact such as angles in a triangle. Introduction to parallel and perpendicular lines. **Classifying 2D shapes** Identifying quadrilaterals and their properties. Introduction to terms such as similar, congruent and symmetry. **Constructing triangles and quadrilaterals** Drawing triangles and quadrilaterals using protractors and rulers.	**Coordinates** Plotting and reading co-ordinates on a 2D plane. Finding midpoints between 2 co-ordinates. Drawing vertical and horizontal lines such as x=4 **Area of 2D shapes** Calculating area of triangles, rectangles and squares. Developing into area of compound shapes. **Transforming 2D figures** Identifying and performing transformations of 2D shape using rotation, reflection, translation and enlargement.	**Prime factor decomposition** Developing understanding of index notation. Using Venn diagrams to find the HCF and LCM of two numbers **Equivalent fractions** Identifying equivalent fractions, simplifying fractions and converting between mixed numbers and improper fractions. **Fractions – adding and subtracting** Adding/subtracting fractions with the same and different denominators, to include mixed numbers	**Ratio** Simplifying ratios. Using the Singapore bar method to enable students to share in given ratios. **Percentages** Exploring the link between fractions, decimals and percentages. Calculating percentages of amounts both using non- calculator methods and multipliers.
Assessment & Educational Visit Opportunities	Autumn 1 assessment	Autumn 2 assessment	Spring 1 assessment	Spring 2 assessment Junior Maths Challenge	Summer 1 assessment	End of Year 7 Assessment

Year 8						
	Learning Period 1: Autumn	**Learning Period 2: Autumn**	**Learning Period 3: Spring**	**Learning Period 4: Spring**	**Learning Period 5: Summer**	**Learning Period 6: Summer**
Topic title	Equations and inequalities	Graphs and estimations	Ratio and proportion	Data	Angles	Area, volume and surface area
Key questions	How do the numbers in a sequence link to their position in the sequence? How can I form an equation to solve problems? What are inequalities and how can I use them to define a range of numbers? How can I apply my understanding of balancing to able me to solve inequalities?	How can I describe the position of any point on a co-ordinate grid? How can I link an algebraic equation to a straight line graph? Why is it necessary to round numbers to a given degree of accuracy? How can I use estimations of calculations to check my work?	What is a ratio and how can it be linked to fractions? How can I use the bar method to solve ratio problems? What are compound measures and how can I calculate them? What is proportion and how can I use it in recipes?	How can I use graphs and charts to visually represent data? How can I use averages to allow me to compare different sets of data? How can I use scatter graphs to display a relationship between two variables?	What relationships exist between angles on parallel lines? How can I generalise the relationship between the number of sides of a polygon and the sum of its interior angles? How are bearings used to give accurate directions?	What is Pi? What is a formula and how can I use it? What is meant by areas and volume?

Key knowledge/concepts and skills	**Sequences** Generating terms for a sequence. Finding the nth term **Forming and solving equations** Solve equations with unknowns on both sides and fractions. Form an equation from a variety of different contexts **Forming and solving inequalities** Form and solve inequalities with unknowns on both sides. Represent inequalities on a number line.	**Linear graphs** Plot co-ordinates in 4 quadrants. Draw straight line graphs Identify the gradient and y-intercept of a line. Identify parallel lines. **Accuracy and estimation** Round numbers to a required number of decimal places/decimal places. Estimate sums by rounding.	**Ratio, real-life graphs and rate of change** Use ratio notation to describe a relationship. Solve problems using ratio. Explore speed and density in context of proportional reasoning. **Direct and inverse proportion** Represent proportional relationships using tables, graphs and algebraically. Solve proportion problems including inverse proportion.	**Construct charts from data** Be able to construct and read a variety of different charts such as bar charts, pictograms and line graphs. **Averages and outliers** Be able to calculate the mean, median and mode from a variety of different contexts, including raw data, charts and discrete tables. Understand the difference between discrete and continuous data. **Scatter graphs** Construct a scatter graph and understand it allows us to see the relationship between two variables. Be able to construct a line of best fit and use it interpolate and extrapolate.	**Parallel line angles** Review of Y7 angle facts work, including parallel line angles **Angles in polygons** Be able to calculate the interior angle sum of a polygon given the number of sides. Be able to use the sum of interior and exterior angles to be able to solve problems. **Bearings** Be able to draw and read bearings using the standard conventions. Solve problems involving bearings using angle facts.	**Circles and composite shapes** Know and use the formulas for area and circumference of a circle Be able to apply understanding of circle formulae to part circles and compound shapes involving circles. **Volume and surface area of prisms** Be able to name different prisms and use the language associated with 3D shapes. Calculate the volume and surface area of cuboids, prisms (including cylinders) and composite shapes.
Assessment & Educational Visit Opportunities	Autumn 1 assessment	Autumn 2 assessment	Spring 1 assessment	Spring 2 assessment Junior Maths Challenge	Summer 1 assessment	End of Year 8 Assessment

Year 9						
	Learning Period 1: Autumn	**Learning Period 2: Autumn**	**Learning Period 3: Spring**	**Learning Period 4: Spring**	**Learning Period 5: Summer**	**Learning Period 6: Summer**
Topic title	Coordinates, Linear Graphs, Proportion and Standard form	Algebraic expressions	2D Geometry	Equations and Inequalities	Trigonometry	Probability and Statistics
Key questions	How can I use co-ordinate patterns to solve problems? What is y=mx+c and how does it link to straight line graphs? How can I represent proportion graphically and use it to help e solve problems? Why do we write numbers in standard form? What are scales and how can we use them to represent real life problems?	What are the basic rules of algebra? How do I solve equations using balancing? How do I convert between brackets and factorised forms? How can I represent real life situations algebraically to help me solve problems?	How can I use a compass to construct a perpendicular lines and angle bisectors? What is congruency and how can I use the rules of congruency to find identical shapes? What is similarity and how can I use it to solve problems? What are the properties of key shapes including quadrilaterals?	How can I apply my balancing skills to solving inequalities? How can I solve equations with two different variables? How can I use a graph to solve equations with two variables? What different types of graph are there? What shape is a quadratic graph and how do I use my knowledge of linear graphs to enable me to draw a quadratic graph?	How does Pythagoras' theorem link the 3 sides of a right-angled triangle? How can I sue Pythagoras' theorem to solve problems in contexts such as bearings? What is SOHCAHTOA and how does it link 2 sides and an angles together in a right angled triangle? How can I use properties of shapes to prove some geometrically?	What is the probability scale and how can I represent probabilities through fractions, decimals and percentages? What is relative frequency and how can I use it to predict the outcomes of experiments? How can I use a Venn diagram or frequency tree to organise data in a systematic way? What is grouped data and why would we choose to group data together? How can I compare two or more data sets? What are cumulative frequency curves and box plots and how do they link together?

Key knowledge/concepts and skills	**Coordinates** Plot coordinates in all four quadrants Find the midpoint of a line segment joining two points Find an endpoint of a line segment, given the midpoint and one endpoint Solve problems using coordinate grids **Linear Graphs** Identify the equations of horizontal and vertical lines Plot coordinates from a rule to generate a straight line Identify key features of a linear graph Make links between the graphical and the algebraic representation Identify parallel lines from algebraic equations **Direct and Inverse Proportion** Recognise when two quantities are directly or inversely proportional to each other Recognise the graphical representation of a proportional relationship Solve proportion problems Interpret and use conversion graphs and other graphs of proportional relationships	**Algebra recap** Simplify expressions Form and solve linear equations Solve equations with an unknown on one side only. **Expanding and Factorising** Multiply a term over a single bracket Expand products of two or more binomials Factorise expressions into a single bracket Factorise quadratic expressions where the coefficient of x^2 is equal to one **Algebraic manipulation** Write expressions, equations and formulae to represent relationships Use substitution to find the value of one variable given other values Make links between solving linear equations and rearranging formulae	**Constructions** Use the standard ruler and compass constructions for: perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle Understand and use the perpendicular distance from a point to a line as the shortest distance to the line **Congruence and Similarity** Know the criteria for congruence of triangles Apply properties of plane figures, and the criteria for congruence, using appropriate language Enlarge shapes from a given centre, with and without coordinate grids Understand that the corresponding angles of similar shapes are equal	**Linear equations and Inequalities** Form and solve linear equations and inequalities in one unknown, including those where the unknown appears on both sides. Rearrange and solve linear equations and inequalities given in any form, including those involving fractions and brackets. **Simultaneous Equations** Use linear and quadratic graphs to estimate values of y for given values of x Use linear graphs to find approximate solutions of simultaneous linear equations Solve linear-linear simultaneous equations algebraically Find approximate solutions to contextual problems from given graphs of a variety of functions including: Piecewise linear	**Pythagoras** Use Pythagoras' theorem to find missing sides in right-angled triangles Solve associated problems in other shapes where right-angled triangles exist Deduce whether a triangle is right-angled by considering its sides **Trigonometry** Develop an understanding of the trigonometric ratios Solve problems using trigonometric ratios in right-angled triangles **Proof** Appreciate the symmetry properties of triangles and special quadrilaterals Investigate the properties of the diagonals of quadrilaterals and the angles formed when they cross	**Probability** Understand and use the probability scale from 0 to 1 Understand and use the language associated with probability Understand the relationship between relative frequency and theoretical probability Understand that different trials of an experiment may produce different outcomes Systematically list outcomes using a variety of representations Use Venn diagrams and understand the meaning of union and intersection Frequency tree diagrams **Mean from grouped data** Appreciate the difference between discrete and continuous data Understand why the exact mean cannot be found from grouped data

	Standard Form Use standard form to express very large and small numbers Convert between standard form and ordinary numbers Order large and small numbers Use standard form to solve simple problems Use scales to solve distance and area problems in context	Apply "changing the subject" to equations of straight lines Manipulate familiar formulae such as formulae for area and perimeter	Solve problems involving similar triangles **Triangles and Quadrilaterals** Appreciate the symmetry properties of triangles and special quadrilaterals Investigate the properties of the diagonals of quadrilaterals and the angles formed when they cross	(e.g. real-life linear graphs), exponential graphs, reciprocal graphs **Quadratics and other graphs** Plot quadratic graphs Solve problems using given quadratic graphs Solve problems using given reciprocal graphs Solve problems using given piece-wise linear graphs Solve problems using given exponential graphs		Find an estimate of the mean from grouped data and continuous data **Comparing distributions** Describe, interpret and compare distributions, involving appropriate measures of central tendency and spread **Cumulative frequency and Box plots** Construct and interpret cumulative frequency diagrams Construct and interpret box plot
Assessment & Educational Visit Opportunities		Assessment 1	Intermediate maths challenge	Assessment 2		EOY 9 Assessment

Year 10 (Higher)						
	Learning Period 1: Autumn	**Learning Period 2: Autumn**	**Learning Period 3: Spring**	**Learning Period 4: Spring**	**Learning Period 5: Summer**	**Learning Period 6: Summer**
Topic title	Number	Algebra	Percentages and Probability	Geometry	Similarity	Probability and Statistics
Key questions	What is a power and root? How can I calculate with irrational numbers without a calculator? What are indices and how can I evaluate them? How can I calculate with very large and very small numbers without a calculator? What is a sequence and how do I identify different types of sequences?	What methods can I use to solve a quadratic equation? How can I link those solutions to a quadratic graph? How can I solve an equation with more than one variable?	How can I use percentage and decimal conversions to allow me to calculate percentages? How are percentages used in everyday life? How can I calculate a probability for an event or using experimental data? How can I find all the possible outcomes of a situation using systematic listing? What is set notation and how can I use a Venn diagram to organise data?	How can shapes be transformed? What is the error interval caused by rounding numbers and how can we overcome this? What is Pi and how can I use it to calculate area and circumference of a circle? What is the equation of a circle and how can I use this to find key points on a graph? How can I use formulas to calculate volume and surface area of 3D shapes?	How can I use ratio to solve problems? What is a compound measure and how can I use a formula to calculate it? How can I use formal notation to find a formula to link two variables that are in direct or inverse proportion of each other? What is Pythagoras' theorem and how can I use it to find missing lengths on a right angled triangle? What is similarity and how does it link to shapes together? How can I use right angled and non-right angled trigonometry to solve problems?	What is an average and how does it represent a data set? What is the benefit of tabulating data? How can I achieve a fair sample from a population? How can I represent data in a visual format? How can I make predictions from a data set? How can I make comparisons between two data sets?

Key knowledge/concepts and skills	**Powers and Roots** Understand what is meant by squaring, cubing and their inverses. **Surds and Irrational Numbers** Understand what a surd is. Be able to simplify surd using understanding of squared numbers. Expand brackets containing surds. Rationalise the denominator of a fraction with a surd. **Indices** Use the index laws to evaluate numerical indices (including fractional and negative) Use the index laws to simplify algebraic indices (including fractional and negative) **Standard form** Convert between standard form and ordinary numbers Calculate with numbers in standard	**Quadratics** Expand two or more brackets Factorise quadratics including those with a coefficient greater than 1 Use factorising to solve quadratics. Use the quadratic formula to solve quadratics Write a quadratic in the completing the square format **Quadratic graphs** Be able to recognise and draw quadratic graphs Understand the link between solving quadratics and the roots of a graph Be able to solve quadratic simultaneous equations graphically. **Algebraic Fractions** Simplify algebraic fractions using factorising Use the four operations with algebraic fractions.	**Fractions, Decimals and Percentages** Convert between fractions, decimals and percentages **Percentages** Calculate percentage changes Wok out the percentage of an amount Calculate compound interest/depreciation Solve problems with growth and decay **Probability, Sets and Venn diagrams** Calculate basic probabilities and relative frequency Use sample space diagrams and the product rule for counting to systematically list outcomes Use and create tree diagrams with/without replacement I can use a Venn diagram to sort data and solve problems Use set notation for Venn diagrams	**Transformations** Be able to perform the 4 transformations (rotation, reflection, translation and enlargement (including fractional and negative) Be able to describe which transformation has taken place **Upper and Lower Bounds** Be able to write down the error interval for a given degree of accuracy Work out the upper and lower bound of a given value Find the upper and lower bound of a given calculation **2D shapes including circle geometry** Calculate the area and circumference of circles and part circles Calculate the area and perimeter of sectors Recognise and use the equation of a circle	**Ratio review** Share in a given ratio Solve problems when given part of a ratio Write ratios as fractions and equations Combine ratios **Compound Measure** Use compound measures such as density and speed to solve problems **Direct and Inverse Proportion** Use formal notation to solve problems involving direct and inverse proportion including with powers and roots **Pythagoras' Theorem** Use Pythagoras' theorem to be able to solve problems including those in 3D **Similarity and Trigonometry** Be able to use the principles of	**Averages and Spread** Calculate the averages and measures of spread of a set of data Calculate averages from ungrouped and grouped data tables **Data collection and Sampling** Tabulate and classify data Identify different types of sampling Calculate group sizes for stratified sampling **Presenting Data including Scatter Graphs** Construct and interpret pie charts Interpret time series graphs Plot scatter graphs and identify correlation/relationships Use a line of best fit to extrapolate/interpolate Construct and interpret frequency polygons **Further Statistical Diagrams** Construct histograms Plot and interpret cumulative frequency Construct and compare box plots

	form using all 4 operations **Sequences** Understand how the different types of sequences are generated including arithmetic, geometric, Fibonacci and triangular numbers Generate a sequence given the nth term (including quadratic) Assess if a number appears in a sequence Find the nth term of a given sequence including quadratic nth term.	Solve equations with algebraic fractions **Simultaneous Equations** Solve linear simultaneous equations Form linear simultaneous equations from a variety of contexts including ratio. Solve quadratic simultaneous equations algebraically		**3D shapes** Recognise vocabulary linked to 3D shapes including plans and elevations **Volume and Surface Area** Calculate the volume and surface area of 3D shapes including prisms, cones, spheres and pyramids, using a given formula where appropriate.	similarity to prove two shapes are similar and to solve problems with similar shapes Use SOHCAHTOA to find missing lengths and angles in right angled triangles including in 3D contexts Use cosine rule, sine rule and 1/2absinC in non-right angled triangles to solve problems	
Assessment & Educational Visit Opportunities		Assessment 1	Intermediate maths challenge	Assessment 2		EOY 10 Assessment

Year 10 (Foundation)						
	Learning Period 1: Autumn	**Learning Period 2: Autumn**	**Learning Period 3: Spring**	**Learning Period 4: Spring**	**Learning Period 5: Summer**	**Learning Period 6: Summer**
Topic title	Number	Algebra	Percentages and Probability	Geometry	Similarity	Probability and Statistics
Key questions	What is the difference between a factor and a multiple? What are prime numbers and how can I use them to find the HCF and LCM of two or more numbers? What is a power and root? What are indices and how can I evaluate them? How can I calculate with very large and very small numbers without a calculator? What is a sequence and how do I identify different types of sequences?	What are the core rules of algebra and how can I use them to transform expressions from one format to another? What methods can I use to solve a quadratic equation? How can I link those solutions to a quadratic graph? How can I solve an equation with more than one variable?	How can I use percentage and decimal conversions to allow me to calculate percentages? How are percentages used in everyday life? How can I calculate a probability for an event or using experimental data? How can I find all the possible outcomes of a situation using systematic listing? What is set notation and how can I use a Venn diagram to organise data?	How can shapes be transformed? What is the impact of rounding numbers and how can I use it? What is Pi and how can I use it to calculate area and circumference of a circle? How can I use formulas to calculate volume and surface area of 3D shapes?	How can I use ratio to solve problems? What is a compound measure and how can I use a formula to calculate it? How can I use proportion to solve problems? What is Pythagoras' theorem and how can I use it to find missing lengths on a right-angled triangle? What is similarity and how does it link to shapes together? How can I use right angled trigonometry to solve problems?	What is an average and how does it represent a data set? What is the benefit of tabulating data? How can I achieve a fair sample from a population? How can I represent data in a visual format? How can I make predictions from a data set?

Key knowledge/concepts and skills	**Factors, multiples, and primes** Identify factors, multiples and primes Write a number as a product of prime factors Find the HCF and LCM of two number by listing and Venn diagram **Powers and Roots** Understand what is meant by squaring, cubing and their inverses. **Indices** Use the index laws to evaluate numerical indices (including fractional and negative) Use the index laws to simplify algebraic indices (including fractional and negative) **Standard form** Convert between standard form and ordinary numbers Calculate with numbers in standard form using all 4 operations	**Algebra (KS3 review)** Simplify expressions by expanding single brackets and collecting like terms Rearrange and substitute into a formula Form and solve equations with variables on both sides Factorise into a single bracket **Quadratics** Expand two brackets Factorise quadratics into two brackets including difference of two squares Use factorising to solve quadratics. **Quadratic graphs** Be able to recognise and draw quadratic graphs Understand the link between solving quadratics and the roots of a graph Be able to use a quadratic graph to find solutions **Simultaneous Equations**	**Fractions, Decimals and Percentages** Convert between equivalent fractions and improper fractions to mixed numbers 4 operations with fractions Fractions of amounts Convert between fractions, decimals and percentages **Percentages** Calculate percentage changes Work out the percentage of an amount Calculate compound interest/depreciation Solve problems with growth and decay **Probability, Sets and Venn diagrams** Calculate basic probabilities and relative frequency Use sample space diagrams and the product rule for counting to systematically list outcomes Use and create tree diagrams	**Transformations** Be able to perform the 4 transformations (rotation, reflection, translation and enlargement (including fractional) Be able to describe which transformation has taken place **2D shapes including circle geometry** Rounding and estimation of calculations Calculating area of triangles, quadrilaterals and composite shapes. Calculate the area and circumference of circles and part circles Calculate the area and perimeter of sectors **3D shapes** Recognise vocabulary linked to 3D shapes including plans and elevations **Volume and Surface Area**	**Ratio review** Share in a given ratio Solve problems when given part of a ratio Write ratios as fractions and equations Combine ratios **Compound Measure** Use compound measures such as density and speed to solve problems **Direct and Inverse Proportion** Solve direct and inverse proportion problems using graphs and algebra where appropriate Apply proportional logic to recipe questions **Pythagoras' Theorem** Use Pythagoras' theorem to be able to solve problems. **Similarity and Trigonometry**	**Averages and Spread** Calculate the averages and measures of spread of a set of data Calculate averages from ungrouped and grouped data tables **Data collection and Sampling** Tabulate and classify data Identify different types of sampling Calculate group sizes for stratified sampling **Presenting Data including Scatter Graphs** Construct and interpret pie charts Interpret time series graphs Plot scatter graphs and identify correlation/relationships Use a line of best fit to extrapolate/interpolate Construct and interpret frequency polygons

	<u>Sequences</u> Understand how the different types of sequences are generated including arithmetic, geometric, Fibonacci and triangular numbers Generate a sequence given the nth term Assess if a number appears in a sequence Find the nth term of a linear sequence.	Solve linear simultaneous equations Form linear simultaneous equations from a variety of contexts.	with/without replacement I can use a Venn diagram to sort data and solve problems Use set notation for Venn diagrams	Calculate the volume of 3D shapes including prisms, cones, spheres and pyramids, using a given formula where appropriate. Calculate the surface area of prisms including cylinders.	Be able to use the principles of similarity to solve problems with similar shapes Use SOHCAHTOA to find missing lengths and angles in right angled triangles	
Assessment & Educational Visit Opportunities		Assessment 1		Assessment 2		EOY 10 Assessment

Year 11 (Higher)						
	Learning Period 1: Autumn	**Learning Period 2: Autumn**	**Learning Period 3: Spring**	**Learning Period 4: Spring**	**Learning Period 5: Summer**	**Learning Period 6: Summer**
Topic title	Geometric reasoning and proof	Inequalities and graphs	Algebra and graphs	Mock preparation		
Key questions	What is a column vector? How can I use vectors to solve problems? How can I prove that two vectors exist on a straight line? How can I prove circle theorems using angle facts? What is bearing and how can I use parallel line angle facts to find them? What is congruency and how can I use it to prove two shapes are congruent? How can I use a compass to construct loci?	How can I use my understanding of balancing to solve an inequality? How can I represent an inequality graphically? What is the relationship between the equation of a line and a parallel or perpendicular line? What are the different types of graphs can I generate? How can I apply my understanding of graphs to D-T and V-T graphs? What do trigonometric graphs look like and how can I use them to fid multiple solutions? What is a Venn	How can I apply my understanding of expanding two brackets to three brackets? What is completing the square and how does it link to a quadratic graph? How can I use an algebraic method to convert a recurring decimal to a fraction? How can I prove number patterns using algebra? What is iteration and how can it be used to gain an approximate solution to a cubic? What is function notation? How do I use my understanding of	What do the exam papers look like and how can I apply my knowledge to answering exam style questions?		

		diagram and how can I use it to organise data?	function notation to transform functions graphically?			
Key knowledge/concepts and skills	**Vectors** Use column vector notation and be able to add/subtract vectors Solve problems with vectors using ratios and fractions Prove that vectors are co-linear **Geometric reasoning** Be able to calculate interior and exterior angles of polygons **Circle theorems** Reason using the circle theorems Use circle theorems to derive proofs **Bearings** Understand the conventions involved in bearings Use parallel line angle facts to reason with bearings **Congruence** Identify congruency using the SAS, ASA, SSS and RHS rules	**Inequalities** Solve linear inequalities Identify regions indicated by one or more inequality Solve quadratic inequalities **Linear graphs** Be able to find the equation of a line from two points Be able to find lines that are parallel or perpendicular to a line and that pass through a specified point **Non-linear graphs** Identify a variety of different graphs including quadratic, cubic, reciprocal and exponential graphs Identify the equation of circle and understand how to find the radius and centre point from the equation Plot and interpret distance-time and velocity-time graphs	**Higher algebraic manipulation skills** Expand and simplify triple brackets Use the four operations with algebraic fractions Solve equations involving algebraic fractions Completing the square **Algebraic proof and reasoning** Convert recurring decimals to fractions Be able to represent odd, even and consecutive integers algebraically Derive proofs algebraically **Recurrence relations** Use an iterative relationship to generate a solution Be able to rearrange a quadratic/cubic equation to derive an iteration formula **Functions**	Revision and Exam booklet	Revision and Exam booklet	Revision and Exam booklet

	Prove that two shapes are congruent **<u>Construction and loci</u>** Construct angle bisectors and perpendicular bisectors using a compass Construct loci to solve problems	Calculate and interpret the area under D-T and V-T graphs Interpreting rate of change from a graph **<u>Trigonometric graphs</u>** Identify the graphs of y=sinx, y=cosx and y=tanx Be able to recall exact trigonometric values Be able to use the trigonometric graphs to find values **<u>Venn diagrams and product rule</u>** I can use a Venn diagram to sort data and solve problems Use set notation for Venn diagrams I can use sample space diagrams and the product rule for counting to list outcomes.	Apply function notation Be able to calculate composite functions Be able to find an inverse function **<u>Transformation of graphs</u>** Be able to transform graphs given an equation using standard function notation			
Assessment & Educational Visit Opportunities		Y11 mocks		Y11 assessment	Y11 Assessments	Y11 Assessments

Year 11 (Foundation)						
	Learning Period 1: Autumn	**Learning Period 2: Autumn**	**Learning Period 3: Spring**	**Learning Period 4: Spring**	**Learning Period 5: Summer**	**Learning Period 6: Summer**
Topic title	Geometric reasoning and proof	Inequalities and graphs	Probability and Revision	Mock preparation		
Key questions	What is a column vector? What is bearing and how can I use parallel line angle facts to find them? What is congruency and how can I use it to prove two shapes are congruent? How can I use a compass to construct loci?	How can I use my understanding of balancing to solve an inequality? How can I represent an inequality graphically? What is the relationship between the equation of a line and a parallel line? What are the different types of graphs I can generate? How can I apply my understanding of graphs to D-T and V-T graphs? What do trigonometric graphs look like and how can I use them to fid multiple solutions? What is a Venn diagram and how can I use it to organise data?	What is a Venn diagram and how can I use it to sort data? What is set notation and do I use it? How do I systematically list outcomes and when is it appropriate to use a sample space diagram?	What do the exam papers look like and how can I apply my knowledge to answering exam style questions?		

Key knowledge/concepts and skills	**Vectors** Use column vector notation and be able to add/subtract vectors **Geometric reasoning** Be able to calculate interior and exterior angles of polygons **Bearings** Understand the conventions involved in bearings Use parallel line angle facts to reason with bearings **Congruence** Identify congruency using the SAS, ASA, SSS and RHS rules **Construction and loci** Construct angle bisectors and perpendicular bisectors using a compass Construct loci to solve problems **Compound measures** Use compound measures such as	**Linear inequalities** Solve linear inequalities Identify regions indicated by one or more inequality **Linear graphs** Understand the relationship between an equation of a line and the gradient and intercept of that line Be able to find the equation of a line between two given points **Non-linear graphs** Recognise quadratic, cubic and reciprocal graphs Plot and interpret distance-time and velocity-time graphs Conversion graphs	**Venn diagrams and product rule** I can use a Venn diagram to sort data and solve problems Use set notation for Venn diagrams I can use sample space diagrams and the product rule for counting to list outcomes. **Revision** Review of topic areas from Y10. This will be based on class needs.	Revision and Exam booklet	Revision and Exam booklet	Revision and Exam booklet

	density and speed to solve problems					
Assessment & Educational Visit Opportunities		Y11 mocks		Y11 assessment	Y11 Assessments	Y11 Assessments