

Faculty Statement

The intellectual venture in which we are all engaged requires of the faculty and students alike the highest level of personal and academic success. We provide a broad and balanced curriculum that is comprehensive, inclusive and accessible to all students. We create opportunities for students to learn how to be successful, to gain and hone transferable skills, supported by relevant subject knowledge that enables high standards of academic achievement. Students are able to reason mathematically, they are computer literate, they can demonstrate business studies skills and more importantly they are equipped with the life skills needed to problem solve and progress in the real world.

Maths Department Purpose and Vision:

To ensure that our pupils have access to a high quality mathematics curriculum that is both challenging and enjoyable. Also providing our pupils with a variety of mathematical opportunities, which will enable them to develop into independent learners with inquisitive minds who have secure mathematical foundations and to enable pupils to become fluent in the fundamentals of mathematics through varied and frequent practice, with regular recall to develop and deepen understanding.

Empowering pupils to reason and communicate mathematically and be able to explain their ideas, ensure pupils can create relationships and can make judgements using mathematical language. Students will be able to problem solve and apply the knowledge and skills acquired to complex, multi-step problems. To develop deeper understanding to make links across curriculum areas and foster a mastery approach.

Aims

The national curriculum for mathematics aims to ensure that all pupils:

- **become fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Key stage 3

What:

- consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots
- select and use appropriate calculation strategies to solve increasingly complex problems
- use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships
- substitute values in expressions, rearrange and simplify expressions, and solve equations
- move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs]
- develop algebraic and graphical fluency, including understanding linear and simple quadratic functions
- use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics.

How:

- extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations
- extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically
- identify variables and express relations between variables algebraically and graphically
- make and test conjectures about patterns and relationships; look for proofs or counterexamples
- begin to reason deductively in geometry, number and algebra, including using geometrical constructions
- interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning
- explore what can and cannot be inferred in statistical and probabilistic settings and begin to express their arguments formally.

Why:

- develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems
- develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics
- begin to model situations mathematically and express the results using a range of formal mathematical representations
- select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems.

Key stage 4

What:

- consolidate their numerical and mathematical capability from key stage 3 and extend their understanding of the number system to include powers, roots {and fractional indices}
- select and use appropriate calculation strategies to solve increasingly complex problems, including exact calculations involving multiples of {and surds},
- use of standard form and application and interpretation of limits of accuracy Key stage 4
- consolidate their algebraic capability from key stage 3 and extend their understanding of algebraic simplification and manipulation to include quadratic expressions, {and expressions involving surds and algebraic fractions}
- extend fluency with expressions and equations from key stage 3, to include quadratic equations, simultaneous equations and inequalities
- move freely between different numerical, algebraic, graphical and diagrammatic representations, including of linear, quadratic, reciprocal, {exponential and trigonometric} functions
- use mathematical language and properties precisely.

How:

- extend and formalise their knowledge of ratio and proportion, including trigonometric ratios, in working with measures and geometry, and in working with proportional relations algebraically and graphically
- extend their ability to identify variables and express relations between variables algebraically and graphically
- make and test conjectures about the generalisations that underlie patterns and relationships; look for proofs or counter-examples; begin to use algebra to support and construct arguments {and proofs}

- reason deductively in geometry, number and algebra, including using geometrical constructions
- interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning
- explore what can and cannot be inferred in statistical and probabilistic settings, and express their arguments formally
- assess the validity of an argument and the accuracy of a given way of presenting information.

Why?

- develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems
- develop their use of formal mathematical knowledge to interpret and solve problems, including in financial contexts
- make and use connections between different parts of mathematics to solve problems
- model situations mathematically and express the results using a range of formal mathematical representations, reflecting on how their solutions may have been affected by any modelling assumptions
- select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems; interpret their solution in the context of the given problem.

Year 7						
TERM	AUTUMN 1	AUTUMN 2	SPRING1	SPRING 2	SUMMER 1	SUMMER 2
Text/Topic Skills/ Concept /	Unit 1: Number and Numerals	Unit 5: Positive and negative numbers	Unit 7: Angles	Unit 10: Coordinates	Unit 13: Primes, factors and Multiples	Ratio

	<ul style="list-style-type: none"> - Understand the value of different place value columns in base 10 number systems - Recognise and name nine- and ten-digit numbers in base 10 - Understand a range of notation for quantities of time and time of day <p>Unit 2: Axioms and arrays</p> <ul style="list-style-type: none"> - Use arrays and area models to develop understanding of Commutativity, associativity and distributivity properties - Compare and contrast scaling, area, repeated addition and grouping/sharing models for 	<ul style="list-style-type: none"> - Interpret negative numbers in a variety of contexts - Compare and order positive and negative numbers - Use positive and negative numbers to express change and difference - Understand the meaning of absolute value - Calculate using all four operations with positive and negative values - Form and manipulate expressions involving negative numbers - Use number lines to model calculations with negative numbers 	<ul style="list-style-type: none"> - Draw and measure acute and obtuse angles reliable to the nearest degree - Estimate the size of a given angle - Know and use angle facts: angles at a point, angles at a point on a straight line, vertically opposite angles. - Define parallel and perpendicular lines - Use angle facts around corresponding, alternate and co-interior angles to find missing angles <p>Unit 8: Classifying 2-D Shapes</p> <ul style="list-style-type: none"> - Classifying polygons by symmetry, 	<ul style="list-style-type: none"> - Reading and writing coordinates of points in all four quadrants. - Solving geometric problems involving missing coordinates - Finding the mid-point of a line segment or two points - Recognise and plot horizontal and vertical lines on a coordinate axis <p>Unit 11: Area of 2-D shapes</p> <ul style="list-style-type: none"> - Develop understanding of counting strategies in arrays to using similar strategies to calculate the area of shapes - Finding the area of rectilinear shapes - Finding the area of other 2-D shapes 	<ul style="list-style-type: none"> - Factors and multiples, square numbers, cube numbers, prime number, triangular - Write a number as a product of primes - Find squares, square roots, cubes and cube roots using prime factorisation - Use indices to record repeated multiplication <p>Unit 14: Conceptualising and comparing Fractions</p> <ul style="list-style-type: none"> - Explore multiple representations of fractions - Represent fractions using area diagrams, bar models and number lines 	<ul style="list-style-type: none"> - Understand the concept of ratio and use ratio language and notation - Connect ratio with understanding of fractions - Compare two or more quantities in a ratio - Recognise and construct equivalent ratios - Express ratios involving rational numbers in their simplest form - Construct tables of values and use graphs as a representation for a given ratio
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	<p>multiplication and division</p> <p>- Make links between efficient calculation strategies and the axioms</p> <ul style="list-style-type: none"> Unit 3: Factors and multiples <p>- Understand the terms factor and multiple, highest common factor and lowest common multiple</p> <p>- Recognise and define prime, square and cube numbers</p> <p>- Express an integer as a product of its factors</p> <p>- Conjecture and make generalised statements e.g.:</p> <p>- Square numbers cannot be prime</p>	<p>- Explore scaling with negative multipliers</p> <ul style="list-style-type: none"> Unit 6: Expressions, equations and inequalities <p>- Develop understanding of algebraic notation</p> <p>- Collect like terms to simplify expressions and understand that this is a result of the distributive property</p> <p>- Substitute numerical values into expressions and evaluate</p> <p>- Use the distributive property to identify equivalent</p>	<p>regularity, intersection of diagonals, number of parallel sides</p> <p>- Classify triangles and quadrilaterals according to properties (angles, regularity, symmetry)</p> <p>- Know and use the angle sum of triangles and quadrilaterals</p> <p>- Generalise results for properties of special types of triangles and quadrilaterals</p> <p>- Form and solve equations from contexts arising from properties of triangles and quadrilaterals</p> <p>Unit 9: Constructing triangles</p>	<p>including triangles, and special quadrilaterals</p> <p>- Generalise formulae for finding the area of 2-D shapes using the language of height, base, width, length etc.</p> <p>- Rearrange formulae to make a different subject</p> <p>Unit 12: Transforming 2-D Figure</p> <p>- Reflection of an object in a mirror line</p> <p>- Identify horizontal and vertical mirror lines and their equations</p> <p>- Rotation of an object using the centre of rotation</p> <p>- Translating shapes by a given number of units (positive or</p>	<p>- Recognise and name equivalent fractions</p> <p>- Convert fractions to decimals and to percentages</p> <p>- Convert between mixed numbers and improper fractions</p> <p>- Compare and order numbers (including like and unlike fractions)</p> <p>- Express one quantity as a fraction of another</p> <p>Unit 15: Manipulating and calculating with fractions</p> <p>- Find a fraction of a set of objects or quantity</p>	<p>- Compare ratios by finding a common total value</p> <p>- Solve ratio and proportion problems in a variety of contexts</p> <ul style="list-style-type: none"> Percentages <p>- Understand percentages as a ratio of two quantities where one quantity is standardised to 100</p> <p>- Understand percentages as a fractional operator with a denominator of 100</p> <p>- Understand and interpret percentages over 100</p>
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	<p>- Solve problems involving factors and multiples in unfamiliar contexts</p> <p>Unit 4: Order of Operations</p> <p>- Understand the equal priority of the for operation</p> <p>- Understand that written calculations follow rules of 'syntax'</p> <p>determining the order of operations</p> <p>- Interpret the order of operations from written calculations, function machines and worded descriptions</p> <p>- Form and identify equivalent calculations based on distributivity, commutativity and the order of operations</p>	<p>expressions involving a single bracket and the expanded form</p> <p>- Develop understanding of the equality and inequality signs</p> <p>- Use two equations to form another related equation or inequality</p> <p>- Use different contexts, including sequences, to construct expressions, equations and inequalities</p> <p>- Represent algebraic expressions using a variety of models including arrays and bar models</p>	<p>and quadrilaterals</p> <p>- Construct triangles and quadrilaterals for given conditions</p> <p>using ruler, protractor and compasses</p> <p>- Explore constructions through use of dynamic geometry software</p> <p>- Explore and define the minimum conditions for constructing triangles</p> <p>- Become familiar with the different cases of minimum conditions for the construction of triangles</p>	<p>negative) in the x and y directions</p> <p>- Combining transformations and which combinations can be expressed as a single transformation</p> <p>- Simple enlargements with positive scale factors</p> <p>- Exploring the ratios of sides lengths within and between shapes produced by an object being enlarged by a given scale factor</p> <p>- Recognise which transformations produce congruent shapes</p> <p>- Explore the ratios within and between similar shapes when an object is enlarged by a given scale factor</p>	<p>- Find the whole given a fractional part</p> <p>- Multiply and divide fractions by a whole number or fraction</p> <p>- Solve word problems involving multiplication of a fraction by a whole number or fraction</p> <p>- Add and subtract fractions with like and unlike denominators, mixed numbers and improper fractions</p>	<p>- Interpret a percentage as a fraction and decimal</p> <p>- Express a quantity as a percentage of another</p> <p>- Compare two quantities using percentages</p> <p>- Find a percentage of an amount with and without a calculator</p> <p>- Increase and decrease a quantity by a given percentage</p> <p>- Find a quantity given a percentage of it</p>
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			- Recognise when two triangles are congruent using the criteria of minimum conditions			
Hinge Assignments	<ul style="list-style-type: none"> Progress Review; Pre and Post Assessment 1: Number and numeral, Axioms and arrays, Factors and Multiples, Order of operation <p>(30 marks)</p>	<ul style="list-style-type: none"> Progress Review; Pre and Post Assessment 2: Positive and negative numbers, Expressions, equations and Inequalities. <p>(30 marks)</p>	<ul style="list-style-type: none"> Progress Review; Pre and Post Assessment 3: Angles, classifying 2-D shapes, Constructing triangles and quadrilaterals <p>(30 marks)</p>	<ul style="list-style-type: none"> Progress Review; Pre and Post Assessment 4: Coordinates, Area of 2-D shapes, Transforming 2-D figures <p>(30 marks)</p>	<ul style="list-style-type: none"> Progress Review; Pre and Post Assessment 5: conceptualising and comparing fractions, Manipulation and calculating with Fractions <p>(30marks)</p>	<ul style="list-style-type: none"> Progress Review; Pre and Post Assessment 6: Ratio, Percentages <p>(30 marks)</p>
Summative Assessments			<p>Midyear Assessment to cover all topics taught from Autumn 1</p> <ul style="list-style-type: none"> Non calculator – 50 marks 			<p>End of year Assessment to cover all topics taught throughout the school year</p> <ul style="list-style-type: none"> Non calculator – 50 marks

			<ul style="list-style-type: none"> • Calculator – (50 marks) 			<ul style="list-style-type: none"> • Calculator – (50 marks)
Links to GCSE	<p>Develop students understanding of Prime numbers, factors and multiples as essential building blocks for a lot of number work. Knowledge of how to use these numbers will improve arithmetic and make calculations more efficient.</p> <p>Develop understanding that numbers can be written in words. Both positive and negative numbers can be added, subtracted, multiplied and</p>	<p>To understand numbers below zero are called negative numbers and understand integers manipulation above zero. Knowledge of rules to be used when adding, subtracting, multiplying or dividing positive and negative numbers to solve real life problems.</p> <p>Appreciate letters can be used to stand for unknown values or values that can change. Formulas can be written and equations solved in a range of problems</p>	<p>Understand Loci are used to identify areas that satisfy criteria such as a given distance from a point or halfway between two lines.</p>	<p>Students to explore the use of straight line graphs to show how two values are related, like converting money from pounds to euros.</p> <p>Explore how transformations change the size or position of shapes. Demonstrate congruent shapes are identical, but may be reflected, rotated or translated. Understand scale factors can increase or decrease the size of a shape.</p>	<p>Understand fractions are used commonly in everyday life, eg sale prices at 1/3 off, or recipes using 1/2 a tablespoon of an ingredient. Knowing how to use fractions is an important mathematical skill.</p> <p>Explore decimals are used every day, for example, when using money. Knowing how to use decimal points and places when adding, subtracting, dividing and multiplying is an important mathematical skill.</p>	<p>Develop students understanding that ratios are seen in everyday life. They can be used when adding ingredients to make a meal, when deciding how much pocket money children get or when reading a map.</p> <p>Appreciate percentages are used in everyday life, for example, calculating discounts during sales and interest rates at banks. Knowing how to find and use percentages is an important skill.</p>

	<p>divided using rules. These rules must be applied in a specific order.</p>	<p>in science and engineering.</p> <p>Be able to solve, form and manipulate algebraic expressions including simplifying and rearranging equations. Solve using trial and improvement.</p>				
<p>Cultural capital/enrichment</p>	<p>Autumn 1 project on making generalisation on numbers 1. Use relay activities to facilitate collaborative learning during funky reasons sessions.</p>	<p>Autumn 2 project on making generalisation on numbers 2. Incorporate treasure hunt as an investigative task on negative numbers and basic algebra rules</p>	<p>Financial Maths task on money management and everyday life problem solving</p> <p>Spring 1 project on 2-D geometry to reflect engineering and construction. Use Maths weeks for students to explore different maths</p>	<p>Spring 2 project on The Cartesian plane. Demonstrate understanding of the coordinate plane and investigate its use in real life. Students would be asked to work on a group presentation.</p>	<p>Summer 1 project on fractions. External company presentations on Maths in everyday life and Maths related job opportunities.</p>	<p>Summer 2 project on Ratio and Proportion. Explore proportional representation in the voting system for students to understand how proportion is used in other areas of life.</p>

			contents within a range of tasks			
Literacy /linked reading	<p>Use the following keywords in context, describe and apply these words to demonstrate understanding:</p> <p>Factors, product, prime numbers, square, cubes, add, subtract, multiply and divide.</p>	<p>Apply these words using full sentences to demonstrate understanding:</p> <p>Negative numbers, Expressions, terms, variable, equations and inequalities.</p>	<p>Students summarise their learning at the end of every lesson using key words such as Measure, interior angle, exterior, obtuse, acute, parallel lines, polygons, symmetry and construct,</p>	<p>Keywords displayed throughout lessons, Vocabulary recall to be done as a starter once every week. Students would be expected to spell correctly and write the meaning of words: quadrants, horizontal, vertical, midpoints, segments, transformation etc.</p>	<p>Students encourage to use words in sentences and consider possible ways questions could be asked relating to content taught</p>	<p>Use of etymology to understanding word root/origin and meaning</p>
Oracy	<p>Students narrate their learning and explain their understanding when they solve a problem using the correct Maths vocabulary.</p>	<p>Students should be verbally active in every lesson, they can explain solutions using Maths vocabulary</p>	<p>Students to compare and contrast and explain their reasoning</p>	<p>Use of etymology to demonstrate understanding of words</p>	<p>Recall keywords at the end of lessons</p>	<p>Pair discussion and group activities on presentation.</p>
Numeracy	<p>Maths numeracy booklets for years 7 at tutor time and numeracy starters</p>	<p>Weekly Numeracy tutor time activities.</p>	<p>Weekly Time table task</p>	<p>Use Kahoot maths task on 2D shapes to engage students and develop competition</p>	<p>Maths numeracy booklets for years 7 at tutor time and numeracy starters</p>	<p>Kahoot maths challenge on ratio and percentages</p>

Careers	Trip organised by the career's hub to the Bank of England	External company presentations to students facilitated by Careers Hub about Maths in real life.	Organised trips by the career's hub, location to be confirmed.	External company presentations to students facilitated by Careers Hub about careers in Maths	Organised trips by the career's hub, location to be confirmed	External company presentations to students facilitated by Careers Hub on money management
Year 8						
TERM	AUTUMN 1	AUTUMN 2	SPRING1	SPRING 2	SUMMER 1	SUMMER 2
Text/Skills/Concept/Topic/	Equations and inequalities: <ul style="list-style-type: none"> • Unit 1: Sequences • Generating terms of a linear sequences • Generating terms of a non-linear sequences • Identifying different types of linear and non-linear sequences 	Graphs: <ul style="list-style-type: none"> • Unit 4: Linear graphs • Identify the equations of horizontal and vertical lines (from year 7) • Plot coordinates from a rule to generate a straight line • Develop a rule into an algebraic representation • Develop concept of gradient using graphs of the 	Proportional reasoning: <ul style="list-style-type: none"> • Unit 6: Ratio, real life graphs and rate • Use ratio notation to describe a multiplicative relationship between two quantities (revise from year 7) • Solve problems involving ratios (revise from year 7) 	Representations and reasoning with data: <ul style="list-style-type: none"> • Unit 8: Univariate data • Find the mean, median mode and range from raw datasets • Use the mean, median and mode to compare data sets • Use an average plus the range to compare datasets 	Angles: <ul style="list-style-type: none"> • Unit 10: Angles in polygons • Know the sum of interior angles of a triangle and use to solve angle problems (revise from Year 7) • Explore different methods for finding the sum of the interior angles of polygons by splitting the shape into triangles 	Area, volume and surface area: <ul style="list-style-type: none"> • Unit 12: Circles and composite • Explore relationship between circumference and diameter/radius • Formula for circumference • Explore relationship between area and radius Shapes <ul style="list-style-type: none"> • Explore relationship between circumference and diameter/radius • Formula for circumference • Explore relationship between area and radius

	<ul style="list-style-type: none"> • Finding a given term in a linear sequence • Developing a rule for finding a term in a linear sequence • Generalising the position to term rule for a linear sequence (n^{th} term) • Unit 2: Forming and solving equations • Classifying expressions, equations, inequalities and identities • Deriving equations from different contexts 	<p>form $y = ax$ before moving to equations of the form $y = ax + b$</p> <ul style="list-style-type: none"> • Identify key features of a linear graph including the y-intercept and the gradient • Make links between the graphical and the algebraic representation of a linear graph • Recognise different algebraic representations of a linear graph • Identify parallel lines from algebraic representations • Unit 5: Accuracy and Estimation 	<ul style="list-style-type: none"> • Explore ratios in different contexts including speed and other rates of change • Contrast ratio relationships involving discrete and continuous measures • Use speed and other rates of change to draw and interpret graphical representations • Explore density and concentration as other contexts for proportional relationships • Unit 7: Direct and inverse proportion • Explore contexts involving proportional relationships 	<ul style="list-style-type: none"> • Find the mode, median and mean from tables and graphical representations (not grouped) • Explore methods of data collection including surveys, questionnaires and the use of secondary data • Appreciate the difference between discrete and continuous data • Classify and tabulate data • Conduct statistical investigations using collected data • Unit 9: Bivariate data 	<ul style="list-style-type: none"> • Generalise different methods for finding the sum of interior and exterior angles of a polygon • Use the sum of the interior and exterior angles of a polygon to solve problems • Unit 11: Bearings • Introduce conventions for drawing and measuring bearings • Plot and measure the position of an object on a given bearing and distance from a specified point 	<ul style="list-style-type: none"> • Formula for area of a circle • Area and circumference of a semi-circle and other sectors • Area and perimeter of composite shapes involving sectors of circles • Unit 13: Volume and surface area of prisms • Naming prisms, nets of prisms and using language associated with 3-D shapes • Finding the volume and surface area of cuboids • Finding the volume and surface area of other prisms including cylinders
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	<ul style="list-style-type: none"> • Solving linear equations with an unknown on one side (revise from Year 7) • Solving linear equations with an unknown on both sides • Solving equations involving fractional terms and brackets • Interpreting the solution to an equation based on the context from which it is derived <p style="text-align: center;">• Unit 3: Forming and solving inequaliti es</p>	<ul style="list-style-type: none"> • Round numbers to a required number of decimal places • Round numbers to a required number of significant figures • Identify rounding errors • Estimate quantities in a variety of contexts including area and perimeter • Identify and reason if an estimate is an over- or under-estimate 	<ul style="list-style-type: none"> • Represent proportional relationships using tables and graphs • Represent proportional relationships algebraically • Understanding about graphs of proportional relationships • Solve proportion problems • Meaning and properties of inverse proportional relationships • Investigate constant area as a context for indirect proportion • Represent inverse 	<ul style="list-style-type: none"> • Construct scatter graphs • Examine clusters and outliers • Analyse the shape, strength and direction to make conjectures for possible bivariate relationships • Using range, mean, median and mode to investigate the characteristics of data and to compare to sets of data • Use a scatter graph to plot a line of best fit • Use a line of best fit to interpolate and extrapolate inferences 	<ul style="list-style-type: none"> • Solve problems involving bearings using angle rules from previous units 	<ul style="list-style-type: none"> • Finding the volume and surface area of composite solids • Solving equations and rearranging formulae • Convert between different units of area and Volume
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	<ul style="list-style-type: none"> • Interpreting relationships expressed as inequalities (revise from year 7) • Deriving inequalities from contexts • Forming and solving inequalities with unknown on one side • Forming and solving inequalities with an unknown on both sides • Representing a solution on a number line 					
Hinge Assignments	<ul style="list-style-type: none"> • Progress Review; Pre and Post Assessment 1: Sequences, 	<ul style="list-style-type: none"> • Progress Review; Pre and Post Assessment 2: Linear graphs, Accuracy 	<ul style="list-style-type: none"> • Progress Review; Pre and Post Assessment 3: Rati, real life graphs and rate, 	<ul style="list-style-type: none"> • Progress Review; Pre and Post Assessment 4: Univariate data, 	<ul style="list-style-type: none"> • Progress Review; Pre and Post Assessment 5: 	<ul style="list-style-type: none"> • Progress Reviews; Pre and Post Assessment 6: Circles and composite

	Forming and solving Equations, Forming and solving inequalities (30 marks)	and estimation (30 marks)	Direct and inverse proportion (30 marks)	Bivariate data (30 marks)	Angles in polygons, Bearings (30 marks)	shapes, Volume and Surface area of prisms (30 marks)
Summative Assessments			<p>Midyear Assessment to cover all topics taught from Autumn 1</p> <ul style="list-style-type: none"> • Non calculator – 50 marks • Calculator – 50 marks 			<p>End of year Assessment to cover all topics taught throughout the school year</p> <ul style="list-style-type: none"> • Non calculator – 50 marks <p>Calculator – 50 marks</p>
Links to GCSE	Use Inequalities to show the relationship between two expressions that are not equal to one another.	Understand approximation includes estimation, rounding to powers of 10, decimal places and significant figures. This should form the foundation to upper and lower bounds of accuracy.	Develop understanding of how proportion is used to show how quantities and amounts are related to each other. The amount that quantities change in relation to each	Explore the idea Averages are used in everyday life to give us information about a set of numerical data, give an overview of the values seen and tell us the most common outcome.	Demonstrate understanding that Bearings are three figure angles measured clockwise from North. Relate Loci and construction to this skill in preparation for advance	Understand circles are 2D shapes with one side and no corners. Know the circumference is always the same distance from the

	<p>Inequalities are useful when projecting profits and breakeven figures.</p>		<p>other is governed by proportion rules.</p>	<p>Appreciate Range measures the spread of the data. Create a strong sense of data to enable further analyses on presenting data with scatter graphs and correlation. Understand interpolation and extrapolation</p>	<p>geometry work relating to the sine and cosine rules.</p>	<p>centre - the radius. Sectors, segments, arcs and chords are different parts of a circle.</p> <p>Knowing how to find the perimeter or area of a shape can be useful in everyday life - from wrapping a present to buying a carpet. Use it in calculations to find the amount of materials needed or cost.</p>
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Cultural capital/enrichment	Autumn 1 project on equations and inequalities. Incorporate Reasoning tasks on algebra that relates to everyday life and problem solving.	Autumn 2 project on graphs – representing data. Encourage students to work in groups and demonstrate understanding of graphs in real life such as conversion graphs.	Spring 1 project on proportional reasoning. External presentations on the use and importance of Maths in technology. Relevance of Maths around us in society.	Spring 2 project on representing and reasoning with data. Group task and presentation on representing data during Maths week. Different students groups would be given different topics to research and present their findings.	Summer 1 project on investigating angles. Demonstrate understanding of angle facts through rich activities such as Tarsia investigative pair activities.	Summer 2 project on investigating Area, Volume and surface area. Students to use measuring tools to relate volume and surface area.
Literacy /linked reading	Use the following keywords in context, describe and apply these words to demonstrate understanding: Unknown, equations, formulae, coefficient, inequalities and graphical	Students would be expected to describe these word and write sentences in their own words: Algebraic representation, graphical representation, rounding, decimal places, significant figures, upper bound, lower bound and estimation.	Students would be asked to work in pairs and describe words without saying the word to allow the other student to unpick the correct words: Scales, maps, real life graphs, rates and direct proportion	Encourage students to read aloud in class in turns. Students should be able to relate and make connection with topics. Promote emphasis on these keywords: Construct, interpret, averages, mode, mean, median, range, line of best fit, correlation, interpolation and extrapolation.	Students should be asked to summarise their learning at the end of each lesson in their own words. Related key words to be familiar with are: Interior, exterior, polygon and bearings.	Promote diagrammatic description of contents as a revision tool, promote summary for retention purpose. Effective use of the key words Circles, composite shapes, area, perimeter, volume and surface area.

Oracy and numeracy ninjas	Students to demonstrate understanding of contents by communicating in their pairs.	Recall vocabulary in lessons	Vocabulary recall challenge. Using keywords to demonstrate understanding	Treasure hunt activities to be done in groups	Presentation on projects in groups	Review of different strategies in problem solving task; no pens day.
Numeracy	Maths numeracy booklets for year 8 to be used at tutor time.	Incorporate time table activities and numeracy ninjas.	Time table activities plus 5 a day tasks.	Recall basic formulae from range of topics	Kahoot maths challenge on angles	Maths challenge activity and quizzes.
Careers	Organised Maths trips by the Careers Hub with date and location to be confirmed.	External company presentations to students facilitated by Careers Hub on careers in Maths	Organised Maths trips by the Careers Hub with date and location to be confirmed.	External company presentations to students facilitated by Careers Hub about money management	Organised Maths trips by the Careers Hub with date and location to be confirmed.	External company presentations to students facilitated by Careers Hub about budgeting and relating Maths to everyday life

Year 9

TERM	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
Text/Skills/ Concept t/Topic/	<p>Unit 1: Indices and Standard Form</p> <p>State and apply the laws of indices</p> <p>Simplify an expression involving indices</p> <p>State and apply the definitions of zero and negative indices</p> <p>Express and compare numbers in standard form</p> <p>Calculate using numbers in standard form</p> <p>Unit 2: Proportion</p> <p>Understand the ideas of direct proportion and inverse proportion</p> <p>Determine whether two quantities are in direct proportion or inverse proportion</p> <p>from a graph, a</p>	<p>Unit 3: Recap on Solving Equations in two variables</p> <p>Rearrange a formula to change</p> <p>Understand the properties of a linear equation in two variables</p> <p>Draw the graph of a linear equation in two variables</p> <p>Understand the ideas of simultaneous equations and their solutions</p> <p>Solve simultaneous linear equations in two variables using the graphical method, the substitution method and the</p>	<p>Unit 5: Non-linear Graphs</p> <p>Interpret and draw distance-time graphs and other graphs that show rates of change</p> <p>Use graphs for rates of change to solve problems</p> <p>Interpret and draw the graph of a quadratic function</p> <p>State the properties of quadratic graphs</p> <p>Interpret and draw exponential, reciprocal and piece-wise graphs</p> <p>State the properties of exponential and reciprocal graphs</p>	<p>Unit 7: Pythagoras' Theorem</p> <p>State Pythagoras' Theorem</p> <p>Apply Pythagoras's Theorem to solve problems involving right-angled triangles</p> <p>Apply the converse of Pythagoras's Theorem to determine whether a triangle has a right angle</p> <p>Recognise and use the perpendicular distance from a point to a line as the shortest distance to the line</p> <p>Unit 8: Congruence,</p>	<p>Unit 9: Trigonometry and Bearings</p> <p>State the definitions of trigonometric ratios (sine, cosine and tangent) of acute angles</p> <p>Use trigonometric ratios to find unknown sides and angles in right-angled triangles</p> <p>Apply the trigonometric ratios to solve problems</p> <p>Measure and calculate bearings</p> <p>Solve problems involving bearings</p>	<p>Unit 11: Data Analysis</p> <p>Calculate the mean, median, mode and range of ungrouped data</p> <p>Calculate the mean of grouped data</p> <p>Make comparisons between sets of data</p> <p>Unit 12: Probability & Sets</p> <p>Understand probability as a measure of chance</p> <p>Define the terms sample space, outcomes and event</p> <p>List the sample space for a simple chance situation</p> <p>probability of a simple combined</p>

	<p>table or an equation connecting the two quantities</p> <p>Solve practical problems involving direct proportion and inverse proportion</p>	<p>elimination method</p> <p>Recognise the approximate nature of the graphical method</p> <p>Apply simultaneous linear equations in two variables</p> <p>Unit 4: Quadratic Expressions</p> <p>Understand factorisation of an algebraic expression as a reverse process of expansion</p> <p>Factorise a linear algebraic expression by using common factors</p> <p>manipulate quadratic expressions</p> <p>Expand the product of two</p>	<p>Unit 6: Construction & Loci</p> <p>Construct perpendicular bisectors and angle bisectors</p> <p>Recognise the properties of perpendicular bisectors and angle bisectors</p> <p>Construct a perpendicular to a line from a point or at a given point</p> <p>Construct triangles</p> <p>Construct and describe loci for the paths of points on a plane</p>	<p>Similarity & Enlargement</p> <p>State the conditions for two triangles to be congruent</p> <p>Identify congruent triangles</p> <p>Solve problems involving congruence</p> <p>Understand the idea of similarity</p> <p>State the properties of similar polygons</p> <p>Solve problems involving similarity</p> <p>Enlarge a plane figure by a scale factor</p> <p>Interpret scale drawings</p>	<p>Unit 10: Surface Area (Pyramids & Cones)</p> <p>Visualise the idea of surface areas of pyramids and cones using nets</p> <p>Find the surface areas of pyramids and cones</p> <p>Find the surface areas of composite solids involving prisms, cylinders, pyramids and cones</p>	<p>event using a sample space diagram</p> <p>Identify mutually exclusive events</p> <p>Understand and apply the addition of probabilities for two mutually exclusive events</p> <p>Use set language and set notation to describe a set of objects, its elements and its subsets</p> <p>Draw Venn diagrams to represent sets and their elements</p> <p>Define the union and intersection of two sets and represent them using a Venn diagram</p> <p>Find probabilities using Venn diagram</p>
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		linear algebraic expressions				
Hinge Assignments	Progress Review : Indices and Standard form, Proportion (30 marks)	Progress Review : Solving Equations in two variables, Quadratic Expressions (30 marks)	Progress Review: Constructions, Non-linear Graphs (30 marks)	Progress Review 1: Pythagoras' theorem, Congruence, Similarity & Enlargement (30 marks)	Progress Review 1: Trigonometry and Bearings Surface Area (Pyramids & Cones) (30 marks)	Progress Review: Data Analyses Probability & Sets (30 marks)

Summative Assessments			Midyear Assessment Indices and Standard form, Proportion, Solving equations in two variables, Quadratic Expressions, Constructions and Non-linear Graphs (50 marks)			End of year Assessment Assessment to cover Units 1 – 12 (50 marks)
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<p>Links to GCSE</p>	<p>Students will be presented with activities that will consolidate their understanding of direct and inverse proportion. This will enable students to extend their understanding of the number system and make connections between number relationships and their algebraic representations. This will equip students with the skills needed for GCSE</p>	<p>Guided learning on how to select and use appropriate calculation strategies to solve increasingly complex problems.</p>	<p>Students are given opportunities to reason deductively in geometry, number and algebra, including using geometrical constructions.</p>	<p>Students begin to select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems.</p>	<p>Students are explicitly given opportunities to develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics.</p>	<p>They will be exposed to questions that will help them to model situations mathematically and express the results using a range of formal mathematical representations.</p>
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Cultural capital/enrichment	When teaching standard form students' attention is drawn to the wonders of the solar system and the wider universe by using examples based around the speed of light and distances between celestial bodies.	Real life applications of Mathematical ideas are made explicit to students whenever possible. We offer opportunities for individuals and team competition through the UK	Students are given the opportunity and encouraged to use "bar modelling" to solve problems. This is to help students demonstrate their ability to visually demonstrate a	The history of mathematics is explored which demonstrates the universal nature of the subject and the notion that different cultures have, at different times, been at the forefront of development in the subject.	Students will be instructed to design a theme park. In designing the various attractions at the theme park, students need to be able to identify, visually represent, problem solve, and apply the knowledge of	Students to formulate questions that can be addressed with data collection, They will select and use appropriate statistical methods to analyse data.

		Mathematics Trust.	problem solving strategy.	Students learn about famous mathematicians, such as Pythagoras and Fibonacci, along with the theories or rules they invented	geometry unit through their artistic design of the theme park	
Literacy /linked reading	<p>Teachers to use etymology to promote the correct spelling of key mathematical terms used in the classroom.</p> <p>Example:</p> <p>Break words in to sounds q-u-a-d-r-i-l-a-t-e-r-a-l.</p> <p>Break words in to syllables cir-cum-fer-ence.</p>	<p>Teachers use correct mathematical terms and expect students to do the same</p> <p>Have a vocabulary rich classroom.</p> <p>Introduce new terminology but also consolidate previously used terms wherever possible.</p>	<p>Students are shown a statement and are asked to decide whether the statement is always true, sometimes true or never true.</p> <p>Students should justify their answer with evidence</p>	<p>Build in opportunities for students to present to the class. Whether it be an organised presentation which they research for or coming to the board to explain their solution to a given problem.</p>	<p>Use The Frayer model at the end of topics to assess how well students have understood key terms that have been used throughout that topic.</p> <p>Students fill in definition, facts / characteristics about a given key term, That is, if the key word was quadrilateral an example would be a rhombus and a non- example</p>	<p>Teachers will encourage students to elaborate on their answers. One word answers will not be encouraged,</p>

					would be a pentagon.	
Oracy	Students are constantly engaged in a purposeful maths talk. We get students to articulate their learning in paired or group tasks.	Provides opportunities for student to express themselves, engage in dialogue and present arguments in support of their ideas.	Students are encouraged to become inquisitive learners to ask questions in class to explore concepts	Students are encouraged to use maths journals to record new and unfamiliar maths words and build up their vocabulary.	Teachers are to use full sentences when responding to questions and insist students answer in full sentences. As well as improving oracy, this also helps to teach students how to structure sentences	Students are asked to repeat a correctly modelled sentence (or their own sentence that has been correctly remodelled). This is to encourage students with low self - confidence

<p>Numeracy</p>	<p>Students are able to calculate accurately and efficiently, both mentally and in writing and paper, drawing on a range of calculation strategies.</p>	<p>Students are able to make sense of number problems, including non-routine problems, and recognise the operations needed to solve them.</p>	<p>Students are able to explain and make predictions from the numbers in graphs, diagrams, charts and tables.</p>	<p>Students develop spatial awareness and an understanding of the properties of 2D and 3D shapes.</p>	<p>Students are able to judge whether their answers are reasonable and have strategies for checking them where necessary.</p>	<p>Students are able to measure using standard units and make sensible estimates of measurements.</p>
<p>Careers</p>	<p>Life Skills 1: Recognising your money personality</p> <p>This activity is designed to help students understand and compare their attitudes to money and spending, explore the difference between needs and wants as well as how to plan for future purchases.</p>	<p>Life Skills 2: Value for money</p> <p>The activities provide students with guidance on how to budget and plan for the future, and encourage them to think about how to get value for money on purchases.</p>	<p>Life Skills 3: Next steps in your financial journey</p> <p>The activities are designed to help students understand bank account features and options, as well as understand how to read statements and track transactions.</p>	<p>Life Skills 4: Dealing with financial dilemmas</p> <p>The activities encourage students to consider different attitudes people have to money, discuss common money-related mistakes and threats as well as best practice for keeping financial information safe.</p>	<p>Life Skills 5: Understanding and managing debts</p> <p>The activities are designed to help students consider the advantages and disadvantages of using credit when compared to saving to make purchases.</p>	<p>Life Skills 6: Problem solving</p> <p>This activity is designed to equip students with an adaptable approach to solving problems, large or small. It includes a video and scenarios that encourage development of practical problem solving skills which can be useful for learning, day to</p>

						day life, and when in employment.
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Year 10 - Higher

TERM	AUTUMN 1	AUTUMN 2	SPRING1	SPRING 2	SUMMER 1	SUMMER 2
Text/Topic Skills/Concept	<p>Unit 12.3:</p> <p>Solve problems involving percentage change, including percentage increase / decrease and original value problems, and simple interest including in financial mathematics</p>	<p>Unit 16.3</p> <p>Construct and interpret cumulative frequency graphs and box plots. Analyse the distributions of data sets through appropriate measure of central tendency and spread; graphical representation, including box plots.</p>	<p>Unit 3.3</p> <p>Use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS)</p> <p>Apply the concepts of congruence and similarity, including the relationships between lengths areas and volumes in similar figures.</p>	<p>Unit 6.4</p> <p>Simplify and manipulate algebraic expressions (including those involving surds and algebraic fractions) by:</p> <ul style="list-style-type: none"> • expanding products of two or more binomials • factorising quadratic 	<p>Unit 10.3</p> <p>Solve two simultaneous equations in two variables (linear / linear or linear / quadratic) algebraically; find approximate solutions using a graph.</p> <p>Translate simple situations or procedures into</p>	<p>Unit 11.4</p> <p>Use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from / at a given point, bisecting a given angle); use these to construct given figures and solve loci</p>

	<p>Unit 9.3</p> <p>Change freely between related standard units and compound units in numerical and algebraic contexts</p> <p>Unit 13.2:</p> <p>Use positive integer powers and associated real roots</p> <p>estimate powers and roots of any given positive number</p> <p>Unit 17.1</p> <p>Calculate with roots and with integer and fractional indices</p> <p>Unit 4.1, 4.2 4.4</p> <p>Knowing the limitations of sampling Interpret and construct tables, charts and</p>	<p>Unit 2.1</p> <p>Substitute numerical values into formulae and expressions including scientific formulae.</p> <p>Unit 10.1</p> <p>Solve linear equations in one unknown algebraically (including those with the unknown on both sides of the equation); find approximate solutions using a graph</p> <p>Unit 3.1</p> <p>Derive and use the sum of angles in a triangle (e.g. to deduce and use the angle sum in any polygon, and to derive properties of regular polygons)</p> <p>Unit 3.2</p>	<p>Calculate exactly with surds; simplify surd expressions rationalise denominators</p> <p>Unit 21.1 – 21.3</p> <p>Generate terms of a sequence from either a term-to-term rule. Recognise and use geometrical progressions (r^n where n is an integer and r is a rational number > 0 or a surd) and other sequences. Deduce expressions to calculate the nth term of linear and quadratic sequences.</p> <p>Unit 22.2</p> <p>Compare lengths, areas and volumes using ratio notation; make links to similarity (including trigonometric ratios)</p>	<p>expressions including the difference of two squares;</p> <ul style="list-style-type: none"> simplifying expressions involving sums, products and powers, including the laws of indices. <p>Unit 6.1</p> <p>Understand and use standard mathematical formulae; rearrange formulae to change the subject.</p> <p>Unit 8.1 & 8.2</p> <p>Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments.</p> <p>Relate relative expected frequencies to theoretical probability, using appropriate</p>	<p>algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution</p> <p>Unit 15.2 & 15.3</p> <p>Know and apply formulae to calculate: area of triangles, parallelograms, trapezia; volumes of cuboids and other right prisms (including cylinders)</p> <p>Calculate the volume of spheres, pyramids, cones and composite solids.</p> <p>Unit 11.1</p> <p>Calculate exactly with multiples of π</p> <p>Unit 15.1</p> <p>Solve linear equations in one</p>	<p>problems; know that the perpendicular distance from a point to a line is the shortest distance to the line.</p> <p>Unit 14.2 & 18.2</p> <p>Recognise, sketch and interpret graphs of linear functions, quadratic functions, simple cubic functions, the reciprocal function, exponential functions $y = kx$ for positive values of k, and the trigonometrical functions (with arguments in degrees) for angles of any size</p>
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	<p>diagrams, including frequency tables, bar charts, pie charts for categorical data, vertical line charts for ungrouped discrete numerical data, and know their appropriate use.</p>	<p>Derive and apply the properties and definitions of: special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus; and triangles and other plane figures using appropriate language</p>	<p>Unit 19.1 & 19.2</p> <p>Know the formulae for: Pythagoras' theorem, trigonometric ratios, apply them to find angles and lengths in right-angled triangles, where possible, general triangles in two and three dimensional figures.</p> <p>Know the exact values of $\sin \theta$ and $\cos \theta$ know the exact value of $\tan \theta$</p>	<p>language and the 0 - 1 probability scale.</p> <p>Understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size.</p> <p>Unit 20.3</p> <p>Calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions.</p> <p>Unit 20.1</p> <p>Enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams and tree diagrams</p>	<p>unknown algebraically (including those with the unknown on both sides of the equation); find approximate solutions using a graph.</p> <p>Unit 10.2</p> <p>Solve quadratic equations (including those that require rearrangement) algebraically by factorising, by completing the square and by using the quadratic formula; find approximate solutions using a graph</p>	
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				Unit 20.4 Calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams		
Hinge Assignments	Progress Review 1: Percentages, Measures & roots Progress Review 2: Organising data, Averages & Spread Calculating with indices.	Progress Review 1: Box plots & Cumulative frequency graphs Progress Review 2: Expressions, linear equations, Angles & 2D shapes	Progress Review : Congruency & Similarity, Converting between units, Sequences, Pythagoras theorem and Trigonometry 1	Progress Review 1: Formulae, expanding & factorising Progress Review 2: Probability, tree diagrams, Sets	Progress Review 1: Quadratic equations and Simultaneous equations Progress Review 2: Circles 1, 3D shapes, Volume and Surface area	Progress Review : Constructions & Loci, all functions
Summative Assessments			End of Term Assessment: Percentage, Measures, Powers & roots, Data, Indices, Box plots & Cumulative frequency, Expressions, linear			End of year Exams GCSE Exam Papers 1, 2 & 3 Maths PPE

			equations, Angles, Congruency & Similarity, Sequences, Pythagoras theorem and Trigonometry. (50 marks)			
Links to GCSE	Exposure to varied fluency activities on number and numeracy.	Students are allowed enough time to just practise until they are confident. Use of retrieval practice in every lesson to help students remember concepts learnt in previous lessons.	Guided learning on how to identify information needed to solve a problem and what specific Maths to use.	Students are encouraged to justify their answers by using the correct logical argument that has a complete chain of reasoning to it and uses words such as 'because', 'therefore', 'and so', 'that leads to' ...	Students are explicitly given opportunities to develop key problem-solving skills in every lesson. They are taught to sometimes work backwards, systematically or visualise the problem when solving problems in lesson.	Students are given time to talk to each other. Students are given opportunity to articulate their learning.
Literacy /linked reading	Speaking and listening: Encourage structured discussion in the classroom effectively and analyse some students' talk in mathematics.	Reading to understand: Improve the skills of reading in mathematics by modelling the process of reading and using active-reading strategies. Example:	Writing: Develop and practise writing skills in mathematics. Example: Students are encouraged to justify their answers and processes and	Mathematical vocabulary: Ambiguity in mathematical vocabulary is considered and a look is taken at activities to develop the use of mathematical	Spelling: Promote the correct spelling of key mathematical terms. Example: Break words in to syllables and use etymology to understand meaning of words eg. cir-cum-fer-ence	Encourage stem sentences: Stem sentences are a way of modelling full sentences. Stem sentences are used to encourage students to give focused answers

	<p>Example: Build in opportunities for students to present to the class. Whether it be an organised presentation which they research for or coming to the board to explain their solution to a given problem.</p>	<p>Dialoguing with students about any difficulties they may have in understanding a problem after reading and asking different students to share their understanding.</p>	<p>the use of facts to explain their thinking.</p> <p>Students are required to take notes, write down formulas, key concepts, and the steps used to solve each type of problem in their books.</p>	<p>vocabulary.</p> <p>Example: Display mathematical vocabulary around the classroom</p>		<p>when explaining their reasoning.</p>
<p>Oracy</p>	<p>Students talk about their ideas with a partner before feeding back to the class. Working in threes gives a less confident learner the chance to listen and learn. They can then join in with the conversation when they feel ready.</p>	<p>Teachers are to use the think, pair and share strategy. This strategy gives students more time to think about their responses so they're encouraged to participate. Start by posing the question. Then give the class one to two minutes of silent thinking time. Now ask them to think of the sentence they are about to say before discussing their</p>	<p>Students are helped to expand on an answer by saying something like" 'tell me more", or "how did you get to that answer?". If they struggle, you can ask them to 'phone a friend' to help them explain their thinking before going back to the first student to check whether they can now articulate the answer as well.</p>	<p>Students are encouraged to add further explanation. Instead of putting up hands, the 'build on' hand signal involves making fists and alternately hitting one on top of the other to indicate they wish to continue the current class discussion and add to what is being spoken about at the time.</p>	<p>Teachers are to use full sentences when answering a question themselves and insist students answer in full sentences in response. As well as improving oracy, this also helps to teach students the structure of sentences and can improve the complexity of written work too.</p>	<p>Students are asked to repeat a correctly modelled sentence (or their own sentence that has been correctly remodelled). This is to encourage students with low self - confidence because they are able to hear, learn, and offer the correct answer in class.</p>

		answer with their talk partner (or talk three).				
Numeracy	Students are encouraged to know number facts such as number bonds, multiplication tables, doubles and halves. Students use what they know to figure out answers mentally.	Students can suggest suitable units for measuring and make sensible estimates of measurements.	Students are able to recognise when it is appropriate to use a calculator, and be able to do so effectively.	Students can make sense of number problems, including non-routine problems, and recognise the operations needed to solve them.	Students are given opportunity to explain their methods and reasoning using correct mathematical terms.	Students can judge whether their answers are reasonable and have strategies for checking them where necessary.
Careers		LIFE SKILLS 1: The Business Plan – Four friends are planning to open a new restaurant in their hometown. (Ref. Edexcel Maths GCSE Higher, Page 107)		LIFE SKILLS 2: Starting the business (Ref. Edexcel Maths GCSE Higher, Page 214).		LIFE SKILLS 3: Getting ready (Ref. Edexcel Maths GCSE Higher, Page 214).

Year 10 - Foundation

TERM	AUTUMN 1	AUTUMN 2	SPRING1	SPRING 2	SUMMER 1	SUMMER 2
Text/Topic Skills/ Concept	<p>Unit 12.3: Solve problems involving percentage change, including percentage increase / decrease and original value problems, and simple interest including in financial mathematics.</p> <p>Unit 9.3 Use standard units of measure and</p>	<p>Unit 4.1 Infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling.</p> <p>Unit 4.5 Apply statistics to describe a population</p> <p>Unit 2.1 Substitute numerical values into formulae and expressions</p>	<p>Unit 3.3 Use the basic congruence criteria for triangles</p> <p>Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides including the base angles of an isosceles triangle are equal, and use</p>	<p>Unit 14.1 & 14.2 Plot graphs of equations that correspond to straight-line graphs in the coordinate plane; use the form $y = mx + c$ to identify parallel lines and find the equation of the line with a given gradient. Identify and interpret gradients and intercepts of linear functions graphically and algebraically.</p>	<p>Unit 10.4 Solve two simultaneous equations in two variables (linear / linear algebraically; find approximate solutions using a graph. Translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the</p>	<p>Unit 6.4 Simplify and manipulate algebraic expressions (including those involving surds) by:</p> <ul style="list-style-type: none"> • collecting like terms • multiplying a single term over a bracket • taking out common factors <p>Unit 10.1 & 10.2</p>

	<p>related concepts (length, area, volume / capacity, mass, time, money etc). Apply and interpret limits of accuracy</p> <p>Unit 21.1:</p> <p>Change freely between related standard units (eg time, length, area, volume / capacity, mass) and compound units (eg speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts. Use compound units such as speed, rates of pay, unit pricing, density and pressure.</p> <p>Unit 13.3</p> <p>Use positive integer powers and associated real</p>	<p>including scientific formulae</p> <p>Unit 10.1 & 10.2</p> <p>Solve linear equations in one unknown algebraically (including those with the unknown on both sides of the equation); find approximate solutions using a graph</p> <p>Unit 3.1, 3.2 & 3.4</p> <p>Derive and use the sum of angles in a triangle (eg to deduce and use the angle sum in any polygon, and to derive properties of regular polygons).</p> <p>Derive and apply the properties and definitions of: special types of quadrilaterals, including square, rectangle,</p>	<p>known results to obtain simple proofs</p> <p>Unit 19.1 – 19.3</p> <p>Know the formulae for: Pythagoras' theorem, and the trigonometric ratios, apply them to find angles and lengths in right-angled triangles, where possible, in two dimensions. Apply the concepts of congruence and similarity, including the relationships between lengths in similar figures</p>	<p>Unit 8.1 - 8.4</p> <p>Record, describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees. Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments. Relate relative expected frequencies to theoretical probability, using appropriate language and the 0 - 1 probability scale. Apply the property that the probabilities of an exhaustive set of outcomes sum to 1; apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to 1.</p>	<p>equation(s) and interpret the solution</p> <p>Unit 7.2</p> <p>Know and apply formulae to calculate: area of triangles, parallelograms, trapezia; volumes of cuboids and other right prisms (including cylinders)</p> <p>Unit 11.1</p> <p>Calculate the volume of spheres, pyramids, cones and composite solids</p> <p>Unit 17.2</p> <p>Calculate exactly with multiples of π;</p> <p>Unit 6.3</p> <p>Understand and use the concepts and vocabulary of expressions, equations, formulae, identities,</p>	<p>Solve linear equations in one unknown algebraically (including those with the unknown on both sides of the equation); find approximate solutions using a graph.</p> <p>Unit 21.2</p> <p>Deduce expressions to calculate the nth term of linear sequence.</p> <p>Unit 11.3 & 11.4</p> <p>Use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from / at a given point, bisecting a given angle); use these to construct given</p>
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	<p>roots (square, cube and higher), recognise powers of 2, 3, 4, 5</p> <p>Unit 17.1</p> <p>Calculate with roots and with integer indices</p> <p>Unit 4.5</p> <p>Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through:</p> <ul style="list-style-type: none"> • appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers) 	<p>parallelogram, trapezium, kite and rhombus; and triangles and other plane figures using appropriate language.</p>		<p>Understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size.</p> <p>Unit 20.1 – 20.3</p> <p>Enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams and tree diagrams. Construct theoretical possibility spaces for single and combined experiments with equally likely outcomes and use these to calculate theoretical probabilities. Calculate the probability of independent and dependent combined events, including using tree diagrams and other</p>	<p>inequalities, terms and factors.</p>	<p>figures and solve loci problems; know that the perpendicular distance from a point to a line is the shortest distance to the line.</p> <p>Units 14.2 14.3</p> <p>Plot and interpret graphs (including reciprocal graphs) and graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration. Interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion.</p>
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				representations, and know the underlying assumptions.		
Hinge Assignments	<p>Progress Review: Percentage change, Measures & accuracy and Sequences</p> <p>Powers and roots, Averages and spread 1.</p> <p>(20 marks)</p>	<p>Progress Review: Angles and polygons, Terms & expression.</p> <p>Sampling and solving linear equations</p> <p>(20 marks)</p>	<p>Progress Review: Congruency and similarity, Pythagoras' theorem and Trigonometry</p> <p>(20 marks)</p>	<p>Progress Review 1: Straight line graphs</p> <p>Probability</p> <p>(20 marks)</p>	<p>Progress Review: Simultaneous equations and Area of 2D shapes</p> <p>Equations, identities and functions, Circles 1 and Exact calculations</p> <p>(20 marks)</p>	<p>Progress Review: Expanding and factorising 2, Solving linear equations, Constructions and loci, Equation of a straight line, Distance-time graphs and Nth term of a linear sequence.</p> <p>(20 marks)</p>
Summative Assessments			<p>End of Term Assessment: Percentages, Measures, Powers and roots, Averages, Congruency, Pythagoras' theorem, Trigonometry,</p>			<p>End of year Exams GCSE Exam Papers 1, 2 & 3</p>

			Angles, Sampling and Linear equations (50 marks)			
Links to GCSE	Exposure to varied fluency activities on number and numeracy.	Students are allowed enough time to just practise until they are confident. Use of retrieval practice in every lesson to help students remember concepts learnt in previous lessons.	Guided learning on how to identify information needed to solve a problem and what specific Maths to use.	Students are encouraged to justify their answers by using the correct logical argument that has a complete chain of reasoning to it and uses words such as 'because', 'therefore', 'and so', 'that leads to' ...	Students are explicitly given opportunities to develop key problem-solving skills in every lesson. They are taught to sometimes work backwards, systematically or visualise the problem when solving problems in lesson.	Students are given time to talk to each other. Students are given opportunity to articulate their learning.
Literacy /linked reading	Speaking and listening: Encourage structured discussion in the classroom effectively and analyse some students' talk in mathematics. Example: Build in	Reading to understand: Improve the skills of reading in mathematics by modelling the process of reading and using active-reading strategies. Example: Dialoguing with students about	Writing: Develop and practise writing skills in mathematics. Example: Students are encouraged to justify their answers and processes and the use of facts to explain their thinking.	Mathematical vocabulary: Ambiguity in mathematical vocabulary is considered and a look is taken at activities to develop the use of mathematical vocabulary.	Spelling: Promote the correct spelling of key mathematical terms. Example: Break words in to syllables and use etymology to understand meaning of words eg. cir-cum-fer-ence	Encourage stem sentences: Stem sentences are a way of modelling full sentences. Stem sentences are used to encourage students to give focused answers

	<p>opportunities for students to present to the class. Whether it be an organised presentation which they research for or coming to the board to explain their solution to a given problem.</p>	<p>any difficulties they may have in understanding a problem after reading and asking different students to share their understanding.</p>	<p>Students are required to take notes, write down formulas, key concepts, and the steps used to solve each type of problem in their books.</p>	<p>Example: Display mathematical vocabulary around the classroom</p>		<p>when explaining their reasoning.</p>
<p>Oracy</p>	<p>Students talk about their ideas with a partner before feeding back to the class. Working in threes gives a less confident learner the chance to listen and learn. They can then join in with the conversation when they feel ready.</p>	<p>Teachers are to use the think, pair and share strategy. This strategy gives students more time to think about their responses, so they're encouraged to participate. Start by posing the question. Then give the class one to two minutes of silent thinking time. Now ask them to think of the sentence they are about to say before discussing their answer with their talk</p>	<p>Students are helped to expand on an answer by saying something like" 'tell me more", or "how did you get to that answer?". If they struggle, you can ask them to 'phone a friend' to help them explain their thinking before going back to the first student to check whether they can now articulate the answer as well.</p>	<p>Students are encouraged to add further explanation. Instead of putting up hands, the 'build on' hand signal involves making fists and alternately hitting one on top of the other to indicate they wish to continue the current class discussion and add to what is being spoken about at the time.</p>	<p>Teachers are to use full sentences when answering a question themselves and insist students answer in full sentences in response. As well as improving oracy, this also helps to teach students the structure of sentences and can improve the complexity of written work too.</p>	<p>Students are asked to repeat a correctly modelled sentence (or their own sentence that has been correctly remodelled). This is to encourage students with low self - confidence because they can hear, learn, and offer the correct answer in class.</p>

		partner (or talk three).				
Numeracy	Students are encouraged to know number facts such as number bonds, multiplication tables, doubles and halves. Students use what they know to figure out answers mentally.	Students are able to suggest suitable units for measuring and make sensible estimates of measurements.	Students are able to recognise when it is appropriate to use a calculator, and be able to do so effectively.	Students are able to make sense of number problems, including non-routine problems, and recognise the operations needed to solve them.	Students are given opportunity to explain their methods and reasoning using correct mathematical terms.	Students are able to judge whether their answers are reasonable and have strategies for checking them where necessary.
Careers		LIFE SKILLS 1: The Business Plan – Four friends are planning to open a new restaurant in their hometown. (Ref. Edexcel Maths GCSE Foundation, Page 116)		LIFE SKILLS 2: Starting the business (Ref. Edexcel Maths GCSE Foundation, Page 230).		LIFE SKILLS 3: Getting ready (Ref. Edexcel Maths GCSE Foundation, Page 332).

Year 11 (Higher & Foundation)

TERM	AUTUMN 1	AUTUMN 2	SPRING1	SPRING 2	SUMMER 1	SUMMER 2
Text/Topic	<p>Unit 19.1</p> <p>Know the formulae for: Pythagoras' theorem, and the trigonometric ratios,</p> <p>apply them to find angles and lengths in right-angled triangles, where possible, general</p>	<p>Unit 21.1 – 21.3</p> <p>Generate terms of a sequence from either a term-to-term rule. Recognise and use geometrical progressions (r^n where n is an integer and r is a rational number > 0 or a surd) and other sequences.</p>	<p>A combination of topics students found challenging from the Autumn PPEs</p>	<p>Exam prep</p> <p>Consolidation</p> <p>Revision</p>	<p>Exam prep</p> <p>Consolidation</p> <p>Revision</p>	

	<p>triangles in two and three dimensional figures</p> <p>Unit 19.2</p> <p>Know the exact values of $\sin \theta$ and $\cos \theta$; know the exact value of $\tan \theta$</p> <p>Unit 19.4 & 19.5</p> <p>Apply addition and subtraction of vectors, multiplication of vectors by a scalar and diagrammatic and column representations of vectors. Use vectors to construct geometric arguments and proofs.</p> <p>Unit 20.1 -20.3</p> <p>Enumerate sets and combinations of sets systematically, using tables, grids and Venn diagrams.</p> <p>Use possibility spaces</p>	<p>Deduce expressions to calculate the nth term of linear and quadratic sequences.</p> <p>Unit 22.1 - 22.3</p> <p>Change freely between related compound units (e.g. speed, rates of pay, prices, density, pressure) in algebraic contexts.</p> <p>Compare lengths, areas and volumes using ratio notation; make links to similarity (including trigonometric ratios) and scale factors</p> <p>Make links to similarity.</p> <p>Solve problems involving direct and inverse proportion, including graphical and algebraic. Construct and interpret equations that describe direct and inverse proportion. Interpret</p>				
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	<p>to calculate theoretical probabilities. Construct theoretical possibility spaces for single and combined experiments with equally likely outcomes</p> <p>Calculate the probability of dependent (non-replacement) combined events</p>	<p>the gradient of a straight line graph as a rate of change. Recognise and interpret graphs that illustrate direct and inverse proportion.</p>				
Skill/ Concept	<p>Exposure to varied fluency activities on number and numeracy.</p>	<p>Students are allowed enough time to just practise until they are confident. Use of retrieval practice in every lesson to help students remember concepts learnt in previous lessons.</p>	<p>How to revise. Model solutions</p>	<p>Guided learning on how to identify information needed to solve a problem</p>		
Hinge Assignment	<p>Progress Review 1: Pythagoras and Trigonometry</p> <p>Progress Review 2: Probability</p>	<p>Progress Review: Sequences and Units & Proportionality</p>	<p>Exam prep using Edexcel past papers</p>	<p>Pixl Wave</p>		

End of Unit Assessment		Mock Exam: GCSE Exam Papers 1, 2 & 3	Exam prep using Edexcel past papers (Bi-weekly)	Exam prep using Edexcel past papers (Bi-weekly)	Walking talking mock PPE	
Literacy	<p>Speaking and listening:</p> <p>Encourage structured discussion in the classroom effectively and analyse some students' talk in mathematics.</p> <p>Example: Build in opportunities for students to present to the class. Whether it be an organised presentation which they research for or coming to the board to explain their solution to a given problem.</p>	<p>Reading to understand:</p> <p>Improve the skills of reading in mathematics by modelling the process of reading and using active-reading strategies.</p> <p>Example: Dialoguing with students about any difficulties they may have in understanding a problem after reading and asking different students to share their understanding.</p> <p>Encourage stem sentences:</p> <p>Stem sentences are a way of modelling full sentences. Stem sentences are used to encourage</p>	<p>Writing:</p> <p>Develop and practise writing skills in mathematics.</p> <p>Example: Students are encouraged to justify their answers and processes and the use of facts to explain their thinking.</p> <p>Students are required to take notes, write down formulas, key concepts, and the steps used to solve each type of problem in their books.</p>	<p>Mathematical vocabulary:</p> <p>Ambiguity in mathematical vocabulary is considered and a look is taken at activities to develop the use of mathematical vocabulary.</p> <p>Example: Display mathematical vocabulary around the classroom</p> <p>Spelling:</p> <p>Promote the correct spelling of key mathematical terms.</p> <p>Example: Break words in to syllables and use etymology to understand meaning of words eg. cir-cum-fer-ence</p>		

		students to give focused answers when explaining their reasoning.				
Cultural capital/ enrichment	<p>Maths master class</p> <p>Aiming for grade 7 Maths master class</p> <p>Aiming for grade 9 course</p> <p>Pixl strive for 5</p>	<p>Maths master class</p> <p>Aiming for grade 7 Maths mater class</p> <p>Aiming for grade 9 course</p> <p>Pixl strive for 5</p>				
Links to GCSE		Edexcel examiner reports	<p>Model answers from past exam papers</p> <p>L9 stretch</p> <p>L5 secure</p> <p>L4 developing</p>	<p>Model answers from past exam papers</p> <p>L9 stretch</p> <p>L5 secure</p> <p>L4 developing</p>		
Oracy	Students talk about their ideas with a partner before feeding back to the class. Working in threes gives a less confident learner the chance to listen and learn. They can then join in with the	Teachers are to use the think, pair and share strategy. This strategy gives students more time to think about their responses so they're encouraged to participate. Start by posing the question. Then give the class	Students are helped to expand on an answer by saying something like "tell me more", or "how did you get to that answer?". If they struggle, you can ask them to 'phone a friend' to help them explain their thinking	Students are encouraged to add further explanation. Instead of putting up hands, the 'build on' hand signal involves making fists and alternately hitting one on top of the other to indicate they wish to continue		

	conservation when they feel ready.	one to two minutes of silent thinking time. Now ask them to think of the sentence they are about to say before discussing their answer with their talk partner (or talk three).	before going back to the first student to check whether they can now articulate the answer as well.	the current class discussion and add to what is being spoken about at the time.		
Numeracy	Students are encouraged to know number facts such as number bonds, multiplication tables, doubles and halves. Students use what they know to figure out answers mentally.	Students can suggest suitable units for measuring and make sensible estimates of measurements.	Students are able to recognise when it is appropriate to use a calculator, and be able to do so effectively.	Students can make sense of number problems, including non-routine problems, and recognise the operations needed to solve them.		
Careers	LIFE SKILLS 4: The launch party (Ref. Edexcel Maths GCSE Foundation, Page 434 and Edexcel Maths GCSE Higher, Page442					
Other	Hegartymaths	Hegartymaths				

resources	Pinpoint learning PPE QLA Edexcel Revision workbooks GCSEPod	Pinpoint learning PPE QLA Edexcel Revision workbooks GCSEPod				
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