HEARTWOOD
LEARNING TRUST

CURRICULUM PROGRESSION PATHWAY

Subject Intent
To develop understanding, reasoning, thinking logically and problem solving, so that learners are fully prepared for the future.

Why is the study of mathematics important?
The study of mathematics makes you better at solving problems. It gives you skills that you can use across other subjects and apply in many different job roles.

What skills will the study of mathematics teach you?
● Problem solving ● Critical thinking ● Analytical thinking ● Quantitative reasoning ● Resilience

What will you know and understand from your study of mathematics?
The curriculum across all years is developed as a cycle of learning which returns to and develops topics areas each year. It is intended that AO1, AO2 and AO3 is embedded within all year groups with an emphasis on mastering previous knowledge, skills and understanding and developing these into new avenues within the same topic areas each year. The cycle of learning each year in mathematics includes ten overarching topic areas: Geometry, Algebra, Fractions Decimals & Percentages, Sequences, Number, Statistics, Ratio, Measures, Graphs and Transformations.

How does your study of mathematics support your learning in other subjects?
Supportive learning is being developed across the faculty by promoting cross-curricular links. Overlaps between Programs of Study in different curricula areas are being explored and the Programs of Study updated as an ongoing project to develop these links wherever possible to aid in students' transfer of knowledge and skills.
Some examples are in Geography students have to calculate percentage change, averages and a strong knowledge of representing data. In Science substitution into and rearranging formulas, displaying data, significant figures. In Technology units of measure.

How can you deepen your understanding of mathematics?
● MathsWatch + PinPoint Maths ● UKMT Maths challenges ● AMSP events ● Further Maths GCSE

How can mathematics support your future?
Mathematics helps develop problem solving, reasoning and analytical thinking which can help students become more practical to help in everyday situations. It gives us a way to understand patterns and quantify relationships which helps make predictions.
Post 16 options include A Level Mathematics, A Level Further Mathematics, Core Mathematics. The curriculum prepares students to take these courses.

Exam board used in Y10 & Y11:
Pearson Edexcel

Curriculum Overview for Year 7 in Mathematics

Year 7 Assessments: Assessments in year 7 consist of End of Unit assessments after each unit (10 in total) and two internal EndPoint Assessments (January and June). This combination aims to assess the knowledge and skills a student has covered up to key points in their education including the curriculum covered in previous year/s (KS2). This then allows for a rolling achievement of progress throughout the academic year.

The table below details the skills and knowledge students will be covering each half term in this subject area.

Term	9th September - 25th October	4th November - 20th December	6th January - 14th February	24th February - 4th April	21st April - 23rd May	2nd June - 18th July
	1	2	3	4	5	6
Knowledge and skills which will be covered this year.	**7.1 – Geometry** **Extension** Students study: • Properties of 2D shapes and quadrilaterals • Geometric notation, measuring and drawing line segments and angles. • Angle rules to find missing angles in straight lines, triangles and quadrilaterals • Recognise and use angle rules for angles in parallel lines including algebraic problems using parallel lines	**7.2 – Algebra** **Extension** Students study: • Solving equations involving a 2 step equations with brackets. • Interpretation of expressions as functions machines with inputs and outputs and show 'inverse function' as the reverse process. • The setting up and solving of linear equations and interpret results	**7.4 – Sequences** **Extension** Students study: • Different types of sequences including picture and arithmetic linear sequences. • Special sequences eg. Square + cube numbers, Fibonacci sequences, triangular, quadratic sequences • The generation of a sequence given a rule and a start point • The generating of terms of a sequences from term to term or position to term rule. • Generating a linear sequence given the nth term	**7.6 – Statistics** **Extension** Students study: • The concept of probability and be able to describe it using the correct language. • The concept of bias and fairness, equally and unequally likely outcomes • A probability scale from 0 to 1 and understand probabilities sum to 1 • The recording of results and find probabilities from the outcome of experiments • Identification and categorisation of types	**7.8 – Measures** **Extension** Students study: • Solving problems involving the area and perimeter of Rectangles including using the given area to find missing lengths and calculating algebraic expressions for perimeter and area. • Formulae to calculate and solve problems involving area and perimeter of ANY Triangle and Parallelograms • Perimeters of polygons and calculate area of Composite shapes made up of	**7.9 – Graphs** **Extension** Students study: • How to draw graphs to represent real life situations • How to interpret and read information from real life graphs. **Core** Students Study: • How to draw graphs to represent real life situations • How to interpret and read information from real life graphs. **Support** Students Study:

Knowledge and skills which will be covered this year.	**Core** Students Study: • Properties of 2D shapes • Geometric notation, measuring and drawing line segments and angles. • Angle rules to find missing angles and correctly describe angle fact rules **Support** Students Study: • Properties of 2D shapes • Geometric notation, measuring and drawing line segments and angles. • Angle rules to find missing angles and correctly describe angle fact rules **7.2 – Algebra** **Extension** Students study: • Correct algebraic terminology and notation • Concepts of expressions, equations, in-equations and terms	**Core** Students Study: • Interpretation of expressions as functions machines with inputs and outputs and show 'inverse function' as the reverse process. • Solving of linear equations and interpret results • The writing of simple situations as algebraic expressions, equations or formulae **Support** Students Study: • Substitution into a simple expression or formula • Solving simple 1 or 2 step equations using function machines and their inverse **7.3 – FDP** **Extension** Students study: • Manipulatives to strengthen understanding of fractions and fraction arithmetic	• Finding the nth term for linear sequences. **Core** Students Study: • What a sequence is and can describe a sequence in words. • Different types of sequences including picture sequences and arithmetic linear sequences. • Special sequences eg. Square + cube numbers, Fibonacci sequences, triangular, quadratic sequences • Generation of a sequence given a rule and a start point • Generating terms of a sequences from term to term rule or position to term rule. **Support** Students Study: • What a sequence is and can describe a sequence in words. • Different types of sequences including picture sequences and arithmetic linear sequences.	of data + data collection methods. • The calculation of mean, mode, median and range (basics) • Working with frequency tables • The drawing and interpreting of Bar charts (include vertical line) and pictograms. **Core** Students Study: • The concept of probability and be able to describe it using the correct language. • The concept of bias and fairness, equally and unequally likely outcomes • A probability scale from 0 to 1 and understand probabilities sum to 1 • The recording of results and find probabilities from the outcome of experiments • Identification and categorisation of types of data + data collection methods • The calculation of mean, mode, median and range (basics)	rectangles, triangles and parallelograms. • Formulae to calculate the volume of a cuboid and apply this formula to derive missing lengths when volume is given. • Standard units of mass, length, area, money and other measures and can convert from one metric unit of length to another and convert between imperial and metric units • Conversion rates and conversion graphs to convert currency. • Problem solving questions, including comparing prices. **Core** Students Study: • Formulae to calculate and solve problems involving the perimeter and area of Rectangles and Right angled Triangles and Parallelograms. • How to solve problems involving area and perimeter of Composite Shapes	• How to draw graphs to represent real life situations • How to interpret and read information from real life graphs. **7.10 - Transformations** **Extension** Students study: • Translating a shape when given written instructions. • Describing a translation when given the object and image. • Reflecting a shape using horizontal, vertical and diagonal mirror lines • Rotating a shape around a given point both inside and outside the shape. • Working out the order of rotational symmetry when given an object and its image. • Enlarging an object with and without a grid when given a scale factor. • Correct language when describing a combinations of simple transformations

Knowledge and skills which will be covered this year.	• Situation or procedures as algebraic expressions or formulae • Simplification of expressions by collecting like terms, including indices • Expansion of a single bracket and factorise to a single bracket & appreciate that multiplying brackets & factorising are inverse operations. • Substitute into an expression or formula **Core** Students Study: • Correct algebraic terminology and notation • Concepts of expressions, equations, in-equations and terms • Situations or procedures as algebraic expressions or formulae • Simplification of expressions by collecting like terms, including indices • Expansion of a	• The relationship between fractions and ratio • Simple operation with fractions • Multiplying and dividing fractions by integers and fractions. • Expressing one quantity as a fraction of another, where the fraction is less than 1 • Finding percentages of amounts • Conversion between any fractions, decimals and percentages • Adding and subtracting decimals • Multiplying and dividing decimals by integers **Core** Students Study: • Manipulatives to strengthen students understanding of fractions and fraction arithmetic • Simple operation with fractions • Multiplying and dividing fractions by integers and fractions. •	• Special sequences eg. Square + cube numbers, Fibonacci sequences. • Generating a sequence given a rule and a start point • Generating terms of a sequences from term to term rule or position to term rule. **7.5 – Number** **Extension** Students study: • Understanding Place value for decimals, measures and integers of any size • Use of the inequality symbols =,<,>,≤,≥ • BIDMAS and Ordering numbers. • The recognition of prime numbers, factors, multiples, • Integer powers and associated roots (cube and higher) • Recognition of powers of 2,3,4,5 • The rounding of numbers to given or appropriate degree of accuracy (d.p's and s.f.) • Rounding to estimate numbers	• Frequency tables, drawing and interpretation of Bar charts (include vertical line) and pictograms. **Support** Students Study: • The concept of probability and be able to describe it using the correct language. • The concept of bias and fairness, equally and unequally likely outcomes • A probability scale from 0 to 1 and can understand probabilities sum to 1 • The recording of results and find probabilities from the outcome of experiments • Identification and categorisation of types of data • Calculation of mean, mode, median and range (basics) • Frequency tables • Drawing and interpreting Bar charts (include vertical line) and pictograms.	• Formulae to calculate and solve problems involving volume and surface are of cuboids • How to use standard units of mass, length, money and other measures • How to convert between related standard units (eg. time, length, area, volume or mass. **Support** Students Study: • The solving of problems involving the perimeter of Rectangles using squares and 2 digit integer values • How to calculate the area of Rectangles with integer lengths and widths by counting $1cm^2$ squares developing this into the use of a formula. • How to derive and apply formulae to calculate the area and perimeter of Right angled Triangles. • How to evaluate the perimeter of a Parallelogram and	• The properties of similar and congruent shapes. **Core** Students Study: • Translating a shape when given written instructions. • Describing a translation when given the object and image. • Reflecting a shape using horizontal, vertical and diagonal mirror lines • Rotating a shape around a given point both inside and outside the shape. • Working out the order of rotational symmetry • Enlarging an object on a grid when given a scale factor. • Correct language when describing a combinations of simple transformations • The properties of congruent shapes. **Support** Students Study: • Translating a shape when given written

	single bracket and factorise to a single bracket	Percentages of amounts			use formulae to calculate and solve problems	instructions.

Knowledge and skills which will be covered this year.	• Substitute into an expression or formula • Solving equations involving a 2 step equations **Support** Students Study: • Correct algebraic terminology and notation • The concepts of expressions, equations, inequations and terms • Writing situation or procedures as algebraic expressions or formulae • Simplification of expressions by collecting like terms (no indices) • Expansion and factorisation of a single bracket (number factor only)	• Conversion between simple fractions, decimals and percentages • Adding and subtracting decimals • Multiplying and dividing decimals by integers. **Support** Students Study: • Manipulatives to strengthen students understanding of fractions and fraction arithmetic • Simple operation with fractions • Multiplying and dividing fractions by integers and fractions. • Percentages of amounts • Conversion between simple fractions, decimals and percentages • Adding and subtracting decimals • Multiplying and dividing decimals by integers.	**Core** Students Study: • Understanding Place value for decimals, measures and integers of any size • Use of the inequality symbols =,<,>,≤,≥ • BIDMAS and Ordering numbers. • The recognition of prime numbers, factors, multiples, • Integer powers and associated roots (cube and higher) • Recognition of powers of 2,3,4,5 • The rounding of numbers to given or appropriate degree of accuracy (d.p's only) • Rounding to estimate numbers **Support** Students Study: • Understanding Place value for decimals, measures and integers of any size • Use of the inequality symbols =,<,>,≤,≥ • BIDMAS and Ordering numbers. • The recognition of prime numbers, factors, multiples,	**7.7 – Ratio and Proportion** **Extension** Students study: • Ratio notation and how to simplify a ratio. • Writing a ratio from a description or pictures. • The relationship between ratio and proportion. • Converting between a fraction and a ratio • Using a recipe calculation students should be able to scale up or down. • Converting between metric units. **Core** Students Study: • Ratio notation and how to simplify a ratio. • Writing a ratio from a description or pictures. • The relationship between ratio and proportion. • Converting between a fraction and a ratio • Using a recipe calculation students should be able to scale up or down. • Converting between metric units.	involving area of Parallelograms. • The nets of a cube or cuboid and use this to find the surface area of a cuboid. • The volume of a cuboid by counting cubes and using a formula with integer values for the length of the sides. • How to use standard units of Volume, mass and length measures. • The conversion from one metric unit of length and volume to another and use this to answer problem solving questions. **7.9 – Graphs** **Extension** Students study: • The plotting in points in 4 quadrants • How to draw a linear graph when given points • How to draw a linear graph when given an equation	• Describing a translation when given the object and image. • Reflecting a shape using horizontal, vertical and diagonal mirror lines • Rotation of a shape around a given point and work out the order of rotational symmetry. • The properties of similar and congruent shapes.

Knowledge and skills which will be covered this year.			• Rounding numbers to 10/100/1000 or whole numbers.	**Support** Students Study: • Ratio notation and how to simplify a ratio. • Writing a ratio from a description or pictures. • Converting between a fraction and a ratio • Using a recipe calculation students should be able to scale up or down. • Converting between metric units.	**Core** Students Study: • The plotting in points in 4 quadrants • How to draw a linear graph when given points • How to draw a linear graph when given an equation **Support** Students Study: • The plotting in points in 4 quadrants • How to draw a linear graph when given points • How to draw a linear graph when given an equation	

Curriculum Overview for Year 8 in Mathematics

Year 8 Assessments: Assessments in year 8 consist of End of Unit assessments after each unit (10 in total) and two internal EndPoint Assessments (January and June). This combination aims to assess the knowledge and skills a student has covered up to key points in their education including the curriculum covered in previous year/s (KS2 + Yr7). This then allows for a rolling achievement of progress throughout the academic year.

The table below details the skills and knowledge students will be covering each half term in this subject area.

Term	9th September - 25th October	4th November - 20th December	6th January - 14th February	24th February - 4th April	21st April - 23rd May	2nd June - 18th July
	1	2	3	4	5	6
Knowledge and skills which will be covered this year.	**8.1 – Geometry** **Extension** Students study: • Expanding their knowledge of the properties of 2D and 3D shapes + quadrilaterals • Understand geometric notation, measuring and drawing line segments and angles. • Angle rules to find missing angles in straight lines, triangles and quadrilaterals • Using angle rules for angles in parallel lines • Using angle facts in algebraic problems, including parallel lines • Interior and Exterior angles of polygons • Pythagoras's theorem and understand when to use it to find missing sides of right angled triangles. **Core**	**8.2 – Algebra** **Extension** Students study: • Expanding and factorising simple quadratics with coefficients of 1. • Solving a simple quadratic by factorisation **Core** Students Study: • Solving equations involving a 3 step process and unknowns on 2 sides • Rearranging an expression, simple equation or formula to change the subject with the new subject on one side, 1or 2 step equations including division **Support** Students Study: • Solving simple equations • Interpreting expressions as	**8.4 – Sequences** **Extension** Students study: • Special sequences eg. Triangular and quadratic sequences • How to generate a linear sequence given the nth term • How to find the nth term for linear sequences • Given opportunities to answer simple problem solving questions involving sequences **Core** Students Study: • Special sequences eg. Triangular and quadratic sequences • How to generate terms of a sequences from term to term rule or position to term rule. • How to generate a linear sequence given the nth term	**8.6 – Statistics** **Extension** Students study: • The difference between theoretical probability and relative frequency • Using probabilities to predict future events • Using sample space diagrams for single or combined events and find theoretical probabilities • Probabilities of exhaustive, mutually exclusive events sum to 1. • Relative frequencies tend towards theoretical probability with increasing sample size • Applying systematic listing strategies • Different types of data • Solving problems involving reverse Mean and general Mean Median mode and range • Drawing and interpreting stacked	**8.8 – Measures** **Extension** Students study: • Formulae to calculate and solve problems involving area and perimeter of ANY Triangle and parallelograms • How to find perimeters of polygons and calculate area of Composite shapes made up of rectangles, triangles and parallelograms. • How to find the area of a trapezium by breaking it down into rectangles and triangles. • Prisms and can find the area of a cross section and use this to find the volume of a prism. • All the parts of a circle and can use the formula to find the circumference and area of a circle and be	**8.9 – Graphs** **Extension** Students study: • How to draw graphs to represent real life situations • How to interpret and read information from real life graphs. • Drawing a simple quadratic graph when given an equation **Core** Students Study: • How to draw graphs to represent real life situations • How to interpret and read information from real life graphs. • Drawing a simple quadratic graph when given an equation **Support** Students Study: • How to draw graphs to represent real life situations

	Students Study: • Expanding their knowledge of the			bar charts and pie charts.	comfortable leaving their answers in terms of π	

Knowledge and skills which will be covered this year.	properties of 2D and 3D shapes • Geometric notation, measuring and drawing line segments and angles. • Using angle rules and properties to find missing angles in straight lines, triangles and quadrilaterals • Using angle rules for angles in parallel lines • Using angle facts in algebraic problems, including parallel lines • Finding interior and exterior angles of polygons **Support** Students Study: • Properties of 2D shapes • Geometric notation, measuring and drawing line segments and angles. • Angle facts and can use angle rules to find missing angles in straight lines, triangles and quadrilaterals • The edges, vertices and faces of 3D shapes and use this to draw plans and nets of 3D shapes	functions machines with inputs and outputs • Showing 'inverse function' as the reverse process **8.3 – FDP** **Extension** Students study: • Simplification of fractions with algebra • Adding and subtracting fractions, improper fractions and mixed numbers • Adding and subtracting with simple algebraic fractions • Multiplying and dividing fractions, improper fractions and mixed numbers • Multiplying and dividing with simple algebraic fractions • Expressing one quantity as a fraction of another, where the fraction is more than 1 • Increasing and decreasing by a fraction • Multiplying and dividing a decimal by another • Finding a percentage of a quantity using a multiplier	• How to find the nth term for linear sequences • Given opportunities to answer simple problem solving questions involving sequences. **Support** Students Study: • Opportunities to understand and can explain what a sequence is. • The recognition of different types of sequences including picture sequences and arithmetic linear sequences. • Special sequences e.g. cubic numbers, Fibonacci sequences and square numbers. • How to generate terms of a sequences from term to term rule or position to term rule. **8.5 – Number** **Extension** Students study: • Understanding BIDMAS and Using a calculator.	• Scatter graphs including correlation, best fit lines, predictions and interpolate and extrapolated trends • Stem and Leaf diagrams **Core** Students Study: • The difference between theoretical probability and relative frequency • Sample space diagrams for single or combined events and find theoretical probabilities • Probabilities of exhaustive, mutually exclusive events sum to 1. • Using probabilities to predict future events • Relative frequencies tend towards theoretical probability with increasing sample size • Identifying Types of data • Calculation of mean, mode, median and range (basics) • Drawing and interpreting Stacked bar charts, Pie charts and Scatter graphs	• Standard units of mass, length, area, money and other measures. • Converting from one metric unit of length to another with standard units (eg. time, length, area, volume or mass) and Convert between imperial and metric units. **Core** Students Study: • Formulae to calculate and solve problems involving area and perimeter of any Scalene Triangle and Parallelogram including using the given perimeter or area to find missing lengths. • How to find perimeters of polygons and area problems including Composite shapes composed of rectangles, triangles and parallelograms including using the given perimeter or area to find missing lengths. • All the parts of a circle and can use the formula to find the	• How to interpret and read information from real life graphs. **8.10 - Transformations** **Extension** Students study: • Translating a shape by using vector notation. • Describing a translation using vector notation when given the object and image. • Reflecting a shape using horizontal, vertical and diagonal mirror lines • Reflecting shapes using basic linear graphs i.e x = a, y= b and y = x and y = -x • Deriving the equation of a mirror line given the object and image. • Rotating a shape around a given point both inside and outside the shape. • Describing fully the order of rotational symmetry of any given object and its image. • Enlarging an object on a grid when given a scale factor.

Knowledge and skills which will be covered this year.	• Drawing 3D shapes on isometric paper. **8.2 – Algebra** **Extension** Students study: • Correct algebraic terminology • Simplifying expressions involving rules of indices and fractions. • Expansion of single and double brackets and then simplify by collecting like terms. • Factorising with single brackets, numbers and coefficients. • Simplifying algebraic fractions involving linear factorising • Substitution into an expression or formula with powers and roots. • Solving equations involving a 3 step process and unknowns on 2 sides. • Rearranging an expression or formula to change the subject on one side including	• Expressing one quantity as a percentage of another • Working with percentages greater that 100% • Increasing and decreasing by a percentage, non calculator • Converting between any fractions, % and decimals • Comparing fractions, percentages and decimals **Core** Students Study: • Manipulatives to strengthen students understanding of fractions and fraction arithmetic • Simple operation with fractions • Multiplying and dividing fractions by integers and fractions. • Percentages of amounts • Conversion between simple fractions,	• Converting and calculating with Standard Form numbers • The recognition of common factors and multiples • Prime factorisation and product notation • Using Prime factorisation and product notation to find LCM and HCF • Rules of Indices and associated powers and roots (cube and higher) • The rounding of numbers to given or appropriate degree of accuracy (s.f.) • Rounding to estimate numbers **Core** Students Study: • Understanding BIDMAS and Using a calculator. •.The recognition of common factors and multiples • Prime factorisation and product notation • Using Prime factorisation and	(including correlation, best fit lines, predictions and interpolate and extrapolated trends) • Applying systematic listing strategies **Support** Students Study: • The concept of probability and be able to describe it using the correct language. • A probability scale from 0 to 1 • Using sample space diagrams for single or combined events and find theoretical probabilities • Probabilities of exhaustive, mutually exclusive events sum to 1. • Using probabilities to predict future events • Identifying different types of data • Calculating mean, mode, median and range (basics) • Reading and drawing bar charts (include	circumference and area of a circle. • Using a formula to calculate the surface area and volume of a cuboid and apply this formula to derive missing lengths when volume is given. • The properties of prisms and can find the area of a cross section and use this to find the volume of a prism. • How to use standard units of mass, length, area, money and other measures. • How to convert from one metric unit to another with standard units (eg. time, length, area, volume or mass **Support** Students Study: • Formulae to calculate and solve problems involving area and perimeter of Right angled, Isosceles, Equilateral and	• The correct language when they describe a single resultant transformation after a combination of simple transformations. • How to apply scale drawings, scale factors and maps • How to define a locus. **Core** Students Study: • Translating a shape when given written instructions. • Describing a translation when given the object and image. • Reflecting a shape using basic linear graphs i.e x = a, y= b and y = x and y = -x • Deriving the equation of a mirror line given the object and image. • Rotating a shape around a given point both inside and outside the shape. • Describing fully the order of rotational symmetry of any

	division. **Core** Students Study:	decimals and percentages • Adding and subtracting decimals	product notation to find LCM and HCF	vertical line) • Plotting Scatter graphs	Scalene Triangles and Parallelograms. • How to find perimeters of polygons and area problems including Composite shapes	given object and its image • Enlarging an object on a grid when given a positive scale factor.

Knowledge and skills which will be covered this year.	• Using correct algebraic terminology • Simplifying expressions by collecting like terms involving rules of Indices and Fractions. • Expanding out and simplify 2 or more single eg. 2(x+5) - 3(x+8) • Factorisation with single brackets, numbers and coefficients • Substitution into an expression or formula with powers and roots. **Support** Students Study: • Using correct algebraic terminology • Collecting like terms including those with indices. • Simplifying expressions involving rules of indices and fractions • Expanding and simplifying over single brackets • Factorisation with single brackets, numbers factors and coefficients	• Multiplying and dividing decimals by integers. **Support** Students Study: • Manipulatives to strengthen students understanding of fractions and fraction arithmetic • Simple operation with fractions • Multiplying and dividing fractions by integers and fractions. • Percentages of amounts • Conversion between simple fractions, decimals and percentages • Adding and subtracting decimals • Multiplying and dividing decimals by integers.	• Using Squares and Roots • Integer powers and associated roots (cube and higher) • Recognition of powers of 2,3,4,5 • The rounding of numbers to given or appropriate degree of accuracy (d.p's and S.F's) • Rounding to estimate numbers **Support** Students Study: • Understanding BIDMAS and Using a calculator. • Ordering negative numbers. • The recognition of common factors and multiples. • How to recognise and use Squares and Roots within rules of Indices. • Rounding numbers to 10/100/1000 or whole numbers. • Round numbers to given or appropriate degree of accuracy (decimal places)	• Working with lines of best fit and scatter graphs **8.7 – Ratio and Proportion** **Extension** Students study: • How to write any given ratio in the form 1:n or n:1. • How to divide an amount into a given ratio. • Converting between a fraction and a ratio. • Using scale ratios to find sizes of and from models, scale drawings or maps • Finding a second amount if one side of a ratio or difference is given • How to convert between metric units **Core** Students Study: • Writing ratios in the form 1:n or n:1 • How to divide an amount into a given ratio	composed of rectangles, triangles and parallelograms including using the given perimeter or area to find missing lengths. • All the parts of a circle and can use the formula to find the circumference of a circle and can find the area of a circle by counting squares and using a formula • Nets and recall appropriate formulae to calculate the surface area of a cuboid • Volume of a cuboid by using a formula with integer values for the length of the sides. • How to use standard units of, area, money, time and other measures. • How to convert from one metric unit of length, area and volume to another with standard units. **8.9 – Graphs** **Extension** Students study: • The plotting in points in 4 quadrants	• Correct language when describing a combinations of simple transformations • How to apply scale drawing, scale factors and maps **Support** Students Study: • Translate a shape by using both worded descriptions and vector notation. • Previous Yr7 work on Reflecting a shape using horizontal, vertical and diagonal mirror lines using basic linear graphs i.e x = a, y= b and y = x and y = - x • How to rotate a shape around a given point both inside and outside the shape. • How to enlarge an object on a grid when given a positive scale factor. • How to define a locus.

Knowledge and skills which will be covered this year.				• The converting between a fraction and a ratio • How to use scale ratios to find sizes of and from models, scale drawings or maps • How to find second amount if one side of ratio or difference is given • How to convert between metric units **Support** Students Study: • Understanding ratio notation and how to simplify a ratio. •Writing a ratio from a description or pictures. • How to convert between a fraction and a ratio • Using scale ratios to find sizes of and from models, scale drawings or maps • How to find a second amount if one side of ratio or difference is given • Recipe calculation and how to scale up or down.	• How to draw a linear graph when given points • How to draw a linear graph when given an equation •Drawing graphs to represent real life situations and can interpret and read information from real life graphs **Core** Students Study: • The plotting in points in 4 quadrants • How to draw a linear graph when given points • How to draw a linear graph when given an equation • Drawing graphs to represent real life situations and can interpret and read information from real life graphs **Support** Students Study: • The plotting in points in 4	

				• Students should be able to convert between metric units	quadrants and answer problem solving questions involving	

					finding missing coordinates • Drawing a horizontal or vertical linear graph when given points • Drawing a horizontal or vertical linear graph when given an equation	

Curriculum Overview for Year 9 in Mathematics

Year 9 Assessments: Assessments in year 9 consist of End of Unit assessments after each unit (10 in total) and two internal EndPoint Assessments (January and June). This combination aims to assess the knowledge and skills a student has covered up to key points in their education including the curriculum covered in previous year/s (KS3 - Yr7&8). This then allows for a rolling achievement of progress throughout the academic year.

The table below details the skills and knowledge students will be covering each half term in this subject area.

Term	9th September - 25th October	4th November - 20th December	6th January - 14th February	24th February - 4th April	21st April - 23rd May	2nd June - 18th July
	1	2	3	4	5	6

Knowledge and skills which will be covered this year.	**9.1 – Geometry** **Higher** Students study: • Expanding their knowledge of Interior and Exterior angles of polygons • How to use Pythagoras's theorem	**9.2 – Algebra** **Higher** Students study: • How to multiply 2 brackets containing surds. • Factorisation to solve quadratic equations	**9.4 – Sequences** **Higher** Students study: • Developing geometric sequences (r n where n is an integer and r is a positive rational) • Finding the nth term of a linear sequence	**9.6 – Statistics** **Higher** Students study: • The probabilities of exhaustive, mutually exclusive events which sum to 1. • Using probabilities to predict future events	**9.8 – Measures** **Higher** Students study: • Finding the area and perimeter of composite Shapes • The formulae for area and circumference of a circle	**9.10 – Measures** **Higher** Students study: • How to find the bearing of one point from another •How to draw a combination of bearings to find a location

Knowledge and skills which will be covered this year.	in a range of problems, including 3D Pythagoras • Trigonometric ratios and understand when to use them • Trigonometric ratios to find missing lengths or angles • How to apply trigonometric ratios to non-calculator situations **Foundation** Students Study: • Expanding their knowledge using angle rules and properties to find missing angles in straight lines, triangles, quadrilaterals and parallel lines • Using properties of quadrilaterals and finding interior and exterior angles of polygons • How to use Pythagoras's theorem in a range of problems **Foundation Support** Students Study: • Expanding their knowledge using angle rules and properties to find missing angles in	**Foundation** Students Study: • Quadratic expressions and can expand double brackets • Solving both simple quadratic and simultaneous equations and interpret the results **Foundation Support** Students Study: • The difference between an identity and an equation • How to confidently use inputs and outputs in function machines **9.3 – FDP** **Higher** Students study: • Adding and subtracting with simple algebraic fractions • Multiplying and dividing with simple algebraic fractions • Functional problems involving fractions • Calculating with Simple Interest • Increasing and decreasing by a %, using a calculator and multiplier	• Finding the nth term from a linear fractional sequences • How to find the nth term for a quadratic sequence • Given opportunities to answer simple problem solving questions involving sequences • The finding of sequences which share common terms **Foundation** Students Study: • Special sequences eg. cube and triangular numbers, Fibonacci sequences, square numbers and quadratic sequences • How to generate a linear sequence given the nth term • How to find the nth term for linear sequences • How to answer simple problem solving questions involving sequences **Foundation Support** Students Study: • Special sequences eg. cube numbers,	• Relative frequencies which tend towards theoretical probability with increasing sample size • How to use tree diagrams to calculate probabilities of independent and dependent combined events • How to calculate conditional probabilities (using two way tables, tree diagrams and Venn diagrams) • Set notation and find unions and intersections of sets, and represent them using tables grids and Venn diagrams • The Product Rule for counting • Sampling methods (including limitations) and conduct a stratified sample • Solving problems involving the reverse Mean and problem solving with Mean, Median, Mode and range • How to find averages from frequency tables and grouped frequency tables	• How to calculate the area and circumference of Circles and parts of circles • How to calculate arc lengths, angles and area of sectors including using multiples of π • How to calculate the volume and surface area of cylinders • How to calculate Speed, distance & time, Volume, mass & density, Area, mass and pressure • Shape properties to derive geometric proofs **Foundation** Students Study: • How to convert between related standard units (eg. time, length, area, volume or mass) • How to calculate the area and perimeter of composite Shapes including Trapeziums • Shape properties to derive geometric proofs • The named parts of a circle • Formulae for area and circumference of a circle	• Using a compass, ruler and protractor to construct triangles • Using a compass and straight edge to Bisect an acute, obtuse and reflex angles • Use a compass and straight edge to construct a Perpendicular bisector of a horizontal, vertical and diagonal line segment. • How to construct a Perpendicular to a horizontal and vertical line from a point • How to construct 60^o, 90^o , 45^o and 30^o angles using a compass and a ruler • Given opportunities to do Problem solving with individual loci and a combination of loci Constructions. • Properties of Congruent Shapes and know rules to find congruent triangles. • Properties of similar 2D shapes • Rules to find missing dimensions using similar 2D triangles, including proofs.

Knowledge and skills which will be covered this year.	straight lines, triangles, quadrilaterals and parallel lines • Using properties of quadrilaterals and finding interior and exterior angles of polygons • How to use Pythagoras's theorem in a range of problems **9.2 – Algebra** **Higher** Students study: • Solving equations involving a 3 step process and unknowns on 2 sides • Solving simultaneous equations • The difference between an identity and an equation • Changing the subject of an equation or formula. • The rules of indices to simplify expressions **Foundation** Students Study:	• How to calculate Compound Interest • How to calculate Percentage change • How to calculate Reverse percentage • Solving problems involving % change • Changing recurring decimals to fractions and vice versa **Foundation** Students Study: • Converting between mixed numbers and improper fractions • How to add and subtract fractions including improper fractions and mixed numbers • How to multiply and divide fractions, including improper fractions and mixed numbers • Finding a fraction of an amount • Applying fractions to Functional problems. • Finding a percentage of a quantity using a	Fibonacci sequences and square numbers • Special sequences eg. triangular, quadratic sequences • How to generate a linear sequence given the nth term • Finding the nth term for linear sequences • How to answer simple problem solving questions involving sequences **9.5 – Number** **Higher** Students study: • Calculations with standard form • Using Prime factorisation and product notation to find LCM and HCF • Understanding of difference between exact surd roots and their decimal approximations • Estimating powers and roots of any given positive number • Multiplying and dividing powers including with brackets	• How to describe a population from statistical results and draw and interpret a time series graph **Foundation** Students Study: • Probabilities of exhaustive, mutually exclusive events which sum to 1. • Using probabilities to predict future events • That relative frequencies tend towards theoretical probability with increasing sample size • How to draw frequency trees and use to calculate probability • How to use tree diagrams to calculate probabilities of independent and dependent combined events • Calculation of conditional probabilities (using two way tables, tree diagrams and Venn	• How to calculate the area and perimeter of Circles • Using standard units of mass, length, money and other measures • How to create and use a conversion graph • Converting between currencies • How to calculate speed, distance & time **Foundation Support** Students Study: • How to calculate the area and perimeter of composite Shapes including Trapeziums • Properties to derive geometric proofs • Named parts of a circle and know formulae for area and circumference of a circle • How to calculate the area and perimeter of Circles, Volume	• Linear scale factor (x), area scale factor (x^2). • The properties of vector notation including magnitude. • How to add, subtract and multiply vectors using a scalar **Foundation** Students Study: • How to draw accurate SSS scalene, isosceles and equilateral triangles using construction tools i.e. a compass, protractor and a ruler to the correct level of accuracy +/- 2mm or 2^o. • How to use a compass and straight edge to Bisect an acute and obtuse angle and construct a Perpendicular bisector of a horizontal and vertical line segment. • How to construct a Perpendicular to a horizontal and vertical line from a point • How to construct 60^o, 90^o , 45^o and 30^o

	• Solving equations involving a 3 step process and unknowns on 2 sides	multiplier • Calculation of Simple Interest		diagrams) • Set notation and apply it to Venn diagram questions	and surface area of prisms • Standard units of mass, length, money and other measures • How to convert between related standard units (eg.	angles using a compass and a ruler

Knowledge and skills which will be covered this year.	• The difference between an identity and an equation • How to multiply out and simplify 2 or more single brackets eg. 2(x+5) -3(x+8) • Changing the subject of an equation or formula with subject on one side, including division • The rules of indices to simplify expressions **Foundation Support** Students Study: • Simplifying expressions by collecting terms, multiplying terms and expanding brackets • Substitution into expressions and formulae in a variety of situations • Solving equations involving a 3 step process	• How to Increase and decrease by a %, using a calculator and multiplier • Working with percentage change • Expressing one quantity as a percentage of another • Comparing amounts using percentages • Converting between any fractions, % and decimals • Comparing fractions, percentages and decimals **Foundation Support** Students Study: • Expanding their knowledge in how to Convert between mixed numbers and improper fractions • Adding and subtracting fractions, improper fractions and mixed numbers • Multiplying and dividing fractions, improper fractions and mixed numbers • Finding a fraction of an amount • How to apply fractions to functional problems.	• How to use fractional powers, zero and negative powers • How to solve linear inequalities including using graphs • How to find error intervals of rounded numbers and use error intervals to find Upper and Lower bonds • How to answer questions involving calculating with upper and lower bonds • Simplifying surds and calculate accurately using surds, including double brackets **Foundation** Students Study: • Converting Standard Form numbers •.Using Prime factorisation and product notation to find LCM and HCF • Estimating powers and roots of any given positive number • Multiplying and dividing powers including with brackets • Showing inequalities on a number line • Solving linear inequalities	• Sampling techniques including limitations • Calculation of the Averages from frequency tables • How to Draw and interpret Stem and leaf diagrams • Comparing distributions of results using central tendency and spread (considering outliers) • Describing a population from statistical results • How to draw and interpret Pie charts and Time series **Foundation Support** Students Study: • Probabilities of exhaustive, mutually exclusive events which sum to 1. • Using probabilities to predict future events • That relative frequencies tend towards theoretical probability with increasing sample size • How to represent data values using a range of statistical representations	time, length, area, volume or mass) • How to create and use a conversion graph • How to convert between currencies • How to calculate speed, distance & time **9.9 – Graphs** **Higher** Students study: • Finding the equation of a line • Producing graphs from real situations or procedures • Recognising equations of parallel and perpendicular lines • Plotting quadratic graphs from a table and Understanding significant points of a quadratic curve • How to recognise, sketch and produce graphs of linear, quadratic, cubic and inverse functions • A variety of real life uses of graphs e.g. Distance – time graphs • How to draw a graph to represent a single inequality and a	• Given opportunities to do Problem solving with Constructions. • Solving simple loci problems by drawing diagrams to represent both individual loci and a combination of loci. • The properties of vector notation including magnitude. **Foundation Support** Students Study: • How to draw accurate SSS triangles using construction tools i.e. a compass, protractor and a ruler to the correct level of accuracy +/- 2mm. • Using a compass and straight edge to Bisect an acute and obtuse angle and to construct a Perpendicular bisector of a horizontal and vertical line segment. • How to generate the perpendicular to a horizontal and vertical line from a point • How to construct 60^{o}, 90^{o} , 45^{o} and 30^{o} angles using a compass and a ruler

Knowledge and skills which will be covered this year.		• Finding a percentage of a quantity using a multiplier • How to calculate Simple Interest • Expressing one quantity as a percentage of another • Comparing amounts using percentages • Converting between any fractions, % and decimals	• How to round numbers to given or appropriate degree of accuracy (decimal places and significant figures) • How to use rounding to estimate numbers Find error intervals of rounded numbers **Foundation Support** Students Study: • How to use integer powers and associated roots cube and higher) • How to show inequalities on a number line and solve linear inequalities • Rounding numbers to 10/100/1000 or whole numbers. • Round numbers to given or appropriate degree of accuracy (decimal places and significant figures) • How to use rounding to estimate numbers.	including Frequency tables, Bar charts (including vertical line) and Stacked bar charts • How to draw and interpret Pie charts and draw and interpret a single Stem and Leaf diagram. • How to apply systematic listing strategies **9.7 – Ratio and Proportion** **Higher** Students study: • How to divide an amount into a given ratio • How to find a second amount if one side of ratio or difference is given • Given opportunities to answer geometrical problems involving ratio • Working with fractions in ratio problems • How to compare prices by finding unitary cost • How to scale a recipe up or down	combination of inequalities **Foundation** Students Study: • How to answer problem solving questions involving finding missing coordinates • Finding the equation of a line and produce graphs from real situations or procedures • How to recognise, sketch and produce graphs of linear, quadratic, cubic and inverse functions • Understand a variety of real life uses of graphs e.g.Distance – time graphs **Foundation Support** Students Study: • How to answer problem solving questions involving finding missing coordinates • Finding the	

				• How to find the maximum number that	equation of a line and produce graphs from real situations or procedures	

Knowledge and skills which will be covered this year.				can be produced from given ingredients **Foundation** Students Study: • How to divide an amount into a given ratio using bar models and/or ratio tables • How to find the second amount if one side of ratio or difference is given • Given opportunities to answer geometrical problems involving ratio • Working with fractions in ratio problems • How to compare prices by finding unitary cost • How to scale a recipe up or down • How to find the maximum number that can be produced from given ingredients **Foundation Support** Students Study: • How to divide an amount into a given ratio • The relationship between ratio and proportion • How to find second amount if one side of	• Understand a variety of real life uses of graphs e.g. Distance – time graphs	

				ratio or difference is given • Geometrical problems involving ratio • Comparing prices by finding unitary cost • How to scale a recipe up or down • How to find the maximum number that can be produced from given ingredients		

Curriculum Overview for Year 10 in Mathematics

Year 10 Assessments: Assessments in year 10 consist of End of Unit assessments after each unit10 (10 in total) and two internal Mock exam Assessments (December and June). This combination aims to assess the knowledge and skills a student has covered up to key points in their education including the curriculum covered in previous year/s (KS3 - Yr7 to 9). This then allows for a rolling achievement of progress throughout the academic year.

The table below details the skills and knowledge students will be covering each half term in this subject area.

Term	9th September - 25th October	4th November - 20th December	6th January - 14th February	24th February - 4th April	21st April - 23rd May	2nd June - 18th July
	1	2	3	4	5	6
Knowledge and skills which will be covered this year.	**10.1 – Geometry** **Higher** Students study: • Pythagoras's theorem and understand when to use it	**10.2 – Algebra** **Higher** Students study: • How to work confidently with functions	**10.4 – Sequences** **Higher** Students study: • How to recognise and use geometric sequences (r n where n	**10.6 – Statistics** **Higher** Students study: • How to use tree diagrams to calculate probabilities of	**10.8 – Measures** **Higher** Students study: • Calculating areas of sectors and lengths of	**9.10 – Measures** **Higher** Students study: • How to enlarge a shape around a centre of enlargement by

Knowledge and skills which will be covered this year.	• How to find missing sides of right angled triangles using Pythagoras • How to use Pythagoras's theorem in a range of problems, including 3D Pythagoras • Trigonometric ratios and understand when to use them • How to use trigonometric ratios to find missing lengths or angles • How to use Circle Theorems **Foundation** Students Study: • How to draw plans and elevations of a 3D shape • Recap & extending Y7/8/9 work on using a combination of angle facts to find missing angles • Pythagoras's theorem and understand when to use it • How to find missing sides of	• Constructing an algebraic proof **Foundation** Students Study: • How to simplify and solve non quadratic algebraic fractions. • How to solve simultaneous equations both by elimination and using a graph **Foundation Support** Students Study: • Trigonometric ratios and understand when to use them • How to use trigonometric ratios to find missing lengths or angles **10.3 – FDP** **Higher** Students study: • How to add and subtract with simple algebraic fractions • How to multiply and divide with	is an integer and r is a positive rational) • How to continue sequences involving surds • Finding the nth term from a linear fractional sequences and of a quadratic sequence • Finding the nth term of fractional sequences, including sequences with different rules for numerator and denominator. • Sequences which share common terms • Given opportunities to answer problem solving questions involving quadratic sequences or surds **Foundation** Students Study: • How to generate a linear sequence given the nth term • Finding the nth term of a linear sequence and a linear fractional sequences • Given opportunities to answer simple problem solving questions	independent and dependent combined events • Calculation of conditional probabilities (using two way tables, tree diagrams and Venn diagrams) • Set notation and thus find unions and intersections of sets, and represent them using tables grids and Venn diagrams • Applying their understanding to problem solving with Mean Median mode and range • How to use Reverse Mean • Calculating Averages from frequency tables and also from grouped frequency tables • Comparing distributions of results using central tendency and spread (considering outliers) • The various types of Scatter graphs (including	arcs including finding missing angles • How to convert between related standard units in algebraic problems • How to create and use a conversion graph • How to convert between currencies • How to calculate the volume Pyramids plus the volume and surface area of Cones • How to calculate the volume and surface area of Spheres and Composite shapes • How to calculate the volume of Frustums • How to use shape properties to derive geometric proofs **Foundation** Students Study: • How to calculate area of sectors • How to calculate the volume and surface area of a cylinder • How to calculate accurately using	integer, fractional and negative scale factors with or without a grid. • Correct language when they recognise which type of transformation by comparing the image to the object and are able to describe a single resultant transformation after a combination of transformations. • Bearing problems using Sine and Cosine rules. • How to sketch a diagram to represent a given situation and use angle facts to find answer complex exam questions with bearings. • How to draw diagrams to represent a combination of loci and can describe a situation shown by a loci or involving a combination of loci • Properties of Congruent Shapes and know rules to

	right angled triangles using Pythagoras and how to	simple algebraic fractions	involving sequences	correlation and best fit lines) and use these to make predictions based on interpolated and extrapolated trends.	multiples of π • Converting between related standard units	find congruent triangles and Congruent proofs • Rules to find missing dimensions using similar 2D AND 3D

Knowledge and skills which will be covered this year.	use Pythagoras's theorem in a range of problems, Including 3D shapes • Trigonometric ratios and understand when to use them • How to use trigonometric ratios to find missing lengths or angles **Foundation Support** Students Study: • How to use a combination of angle facts to find missing angles • Pythagoras's theorem and understand when to use it to find missing sides of right angled triangles • How to use Pythagoras's theorem in a range of problems **10.2 – Algebra** **Higher** Students study: • How to change the subject of equations	• How to increase and decrease by a %, using a calculator and multiplier methods • The calculation of compound Interest • Reverse percentage problems • Solving problems involving % change • How to convert between recurring decimals and fractions • How to set up and solve growth and decay problems **Foundation** Students Study: • Functional problems involving fractions • How to calculate with simple Interest • An Increase and decrease by a %, using a calculator and multiplier • How to calculate with compound Interest • Percentage change and can solve reverse percentage problems • How to solve problems involving % change	• How to find sequences which share common terms **Foundation Support** Students Study: • Special sequences eg. cube numbers, Fibonacci sequences and square numbers • Special sequences eg. triangular, quadratic sequences • How to generate a linear sequence given the nth term • Finding the nth term for linear sequences • How to answer simple problem solving questions involving sequences **10.5 – Number** **Higher** Students study: • Calculations with standard form • Understanding of difference between exact surd roots and their decimal approximations	• Capture recapture sampling method • How to use the Product Rule for counting • How to generate a Cumulative frequency graph and Box plot when given a frequency table. • How to compare data sets using CF diagrams or Box plots (central tendency and spread) • How to generate and effectively use data within Histograms. **Foundation** Students Study: • Sample space diagrams for single or combined events and find theoretical probabilities • How to use tree diagrams to calculate probabilities of independent and dependent combined events • How to calculate conditional probabilities (using two way tables, tree diagrams and Venn diagrams)	(eg. time, length, area, volume or mass) • Converting between imperial and metric units and can convert between related standard units in algebraic problems • How to create and use a conversion graph • Converting between currencies • How to calculate with Speed, distance & time **Foundation Support** Students Study: • How to calculate area of sectors, the volume and surface area of a cylinder • How to calculate accurately using multiples of π • Converting between related standard units (eg. time, length, area, volume or mass) • How to convert between imperial and metric units • How to convert between related standard units in algebraic problems • How to create and use a conversion graph	triangles, including proofs. • Linear scale factor (x), area scale factor (x^2), volume scale factor (x^3). • How to find the magnitude of a vector and the resultant vector by combining 2 or more vectors. • How to multiply a vector by a scalar recognising that these vectors are parallel. • Vector properties and factorisation to prove vectors are parallel. **Foundation** Students Study: • How to enlarge a shape around a centre of enlargement by integer and fractional scale factors with or without a grid. • Correct language when they describe a single resultant transformation after a combination of transformations. • How to find the bearing of one point from another

Knowledge and skills which will be covered this year.	and formulae (division and subject on 2 sides) • Solving quadratic equations using factorising, completing the square, quadratic formula • Simplifying and solving quadratic algebraic fractions • How to solve linear and non-linear simultaneous equations **Foundation** Students Study: • The difference between an identity and an equation • Simplifying expressions using the rules of indices • How to rearrange simple equations with new subject on one side, 1 or 2 step • How to rearrange equations with subject on one side, including division • How to rearrange equations with new subject on 2 sides	• How to compare fractions, percentages and decimals **Foundation Support** Students Study: • Recapping, revisit & extending Y7-Y9 understanding of - all arithmetic with fractions • How to find a find a fraction of an amount • Solving functional problems involving fractions • How to find a percentage of a quantity mentally by breaking down percentage • How to find a percentage of a quantity using a multiplier • How to increase and decrease by a percentage using non calculator methods • How to calculate simple Interest • How to increase and decrease by a %, using a calculator	• How to use fractional powers, zero and negative powers • How to solve quadratic inequalities and write solutions to inequalities using set notation • How to answer questions involving calculating with upper and lower bonds • Simplifying surds and calculate accurately using surds, including double brackets • How to Rationalise denominators • How to find approximate solutions to equations numerically using iteration. **Foundation** Students Study: • Converting and calculating with Standard Form numbers •.Using Prime factorisation and product notation to	• Set notation and find unions and intersections of sets, and represent them using tables grids and Venn diagrams • Sampling (including limitations) • How to calculate mean, mode, median and range (basics) including Reverse Mean • Problem solving with Mean Median mode and range • How to compare distributions of results using central tendency and spread (considering outliers) • Averages from frequency tables and also from grouped frequency tables • Scatter graphs (including correlation, best fit lines, predictions and interpolate and extrapolated trends) • Stem and leaf diagrams • Time series	• How to convert between currencies • How to calculate with Speed, distance & time **10.9 – Graphs** **Higher** Students study: • Recognising and finding equations of parallel and perpendicular lines • The understanding of significant points of a quadratic curve • Sketching a quadratic graph from an equation, including finding turning point by completing the square • Velocity – Time graphs • Use linear graphs, gradients and area under graphs, and interpret results • Use quadratic and other non-linear graphs, gradients and area under graphs, and interpret results • Find solutions to real life problems	• How to draw a combination of bearings to find a location • Scale factors, scale diagrams and maps, including estimating from diagrams and making assumptions. • How to use a compass and straight edge to Bisect an acute, obtuse and reflex angles and to construct a Perpendicular bisector of a horizontal, vertical and diagonal line segment. • How to construct a Perpendicular to a horizontal and vertical line from a point • How to construct 60^{o}, 90^{o} , 45^{o} and 30^{o} angles using a compass and a ruler • Given opportunities to do Problem solving with individual loci and a combination of loci Constructions.

	or parts of a fraction	and multiplier methods	find LCM and HCF • Understand and use zero and negative powers	• Apply systematic listing strategies	from graphs, including piece wise linear, exponential and reciprocal graphs	• The rules to find congruent triangles and can recognise similar triangles. • The rules to find missing dimensions using similar 2D

Knowledge and skills which will be covered this year.	• How to factorise and solve quadratic expressions **Foundation Support** Students Study: • How to simplify expressions by collecting terms, multiplying terms and expanding brackets • Substitution into expressions and formulae in a variety of situations • The solving of equations involving a 3 step process • The difference between an identity and an equation • How to rearrange simple equations to change the subject • Using inputs and outputs in function machines • How to begin manipulating algebraic fractions	• Comparing fractions, percentages and decimals	• Find error intervals of rounded numbers • How to use error intervals to find Upper and Lower bonds **Foundation Support** Students Study: • Converting and calculating with Standard Form numbers •.How to use Prime factorisation and product notation • How to round numbers to given or appropriate degree of accuracy (decimal places) • How to round numbers to given or appropriate degree of accuracy (significant figures) • Using rounding to estimate numbers • Finding error intervals of rounded numbers	**Foundation Support** Students Study: • Sample space diagrams for single or combined events and find theoretical probabilities • How to use frequency trees to calculate probability • How to use tree diagrams to calculate probabilities of independent and dependent combined events • How to calculate conditional probabilities (using two way tables, tree diagrams and Venn diagrams) • Sampling (including limitations) • How to calculate mean, mode, median and range (basics) • Averages from frequency tables • Scatter graphs (including correlation, best fit lines, predictions and interpolate and extrapolated trends) • Stem and leaf diagrams • Applying systematic listing strategies	• Recognise and sketch the graph of an exponential function y = kx, for positive k • Recognise and sketch sinx, cosx and tanx graphs • Transformation of the graph y = f(x) • Sketch a circular function from equation • Derive equation from the graph of a circular function • Find the equation of the tangent of a circle at a given point **Foundation** Students Study: • Drawing a linear graph from equation and finding the equation of a line • Recognising equations of parallel and perpendicular lines • How to recognise, sketch and plot quadratic graphs from a table plus understand significant points of a quadratic curve. • Recognise, sketch and produce graphs of linear, quadratic, cubic and inverse functions	triangles, including proofs. • Linear scale factor (x), area scale factor (x2). • The properties of vector notation including magnitude. • How to add, subtract and multiply vectors using a scalar **Foundation Support** Students Study: • How to find the bearing of one point from another • How to draw a combination of bearings to find a location • Scale Drawing and can use scale factors, scale diagrams and maps, including estimating from diagrams and making assumptions. • How to use a compass and straight edge to Bisect an acute and obtuse angle and to construct a Perpendicular bisector of a horizontal or vertical line segment. • How to construct a

						Perpendicular to a
Knowledge and skills which will be covered this year.				**10.7– Ratio and Proportion** **Higher** Students study: • How to solve 2 ratio problems of the form a:b and b:c • Given opportunities with ratio problem solving • Direct proportion problems, including graphical and algebraic problems • Inverse proportion problems, including graphical and algebraic problems • How to construct and use equations that describe direct and inverse proportion **Foundation** Students Study: • How to use scale ratios to find sizes of and from models, scale drawings or maps • Geometrical problems involving ratio • Working with	• Understand a variety of real life uses of graphs e.g.Distance – time graphs • Draw a graph to represent an inequality and to represent a combination of inequalities • Recognise and sketch sinx, cosx and tanx graphs **Foundation Support** Students Study: • Drawing a linear graph from equation and finding the equation of a line • Recognising equations of parallel and perpendicular lines • How to recognise, sketch and plot quadratic graphs from a table plus understand significant points of a quadratic curve. • Recognise, sketch	horizontal and vertical line from a point. • The solving of AO2 / AO3 exam style questions involving a combination of constructions • How to find the locus of a distance from a point and from a straight line. • How to recognise properties of similar triangles. • The properties of vector notation and can add and subtract vectors

				fractions in ratio problems • Solving 2 ratio problems of the form a:b and b:c	and produce graphs of linear, quadratic, cubic and inverse functions • Understand a variety of real life uses of graphs e.g.Distance – time graphs	

				• Given opportunities to complete ratio problem solving • Direct proportion problems, including graphical and algebraic problems • Inverse proportion problems, including graphical and algebraic problems **Foundation Support** Students Study: • Ratio notation and Simplify a ratio • How to write a ratio in form 1:n or n:1 • How to divide an amount into a given ratio • The relationship between ratio and proportion • How to use scale ratios to find sizes of and from models, scale drawings or maps • Given opportunities to answer geometrical problems involving ratio • Working with fractions in ratio problems	• Draw a graph to represent an inequality and to represent a combination of inequalities • Recognise and sketch sinx, cosx and tanx graphs	