Curriculum Information
Maths

What I learn about in the curriculum…

Year		Topics	How does this build on from previous learning?	The key concepts we cover
7	Overview	In year 7 we study a series of topics relating to Maths. Many of these such as the number system and measuring spaces are topics that are sequenced from primary. Others such as algebraic notation are newer topics to the year.		Number Algebra Geometry Data handling Ratio and proportion Problem solving and reasoning
	Autumn 1	• Numbers and the number system • Checking, approximating and estimating • Calculating	Building on from these primary skills: • Multiply and divide by 10, 100, and 1000 • Knowing the meaning of factor multiple and prime • Multiplication and division facts • Long multiplication • Short division • Column addition and subtraction • Knowing the place value of any given digit	
	Autumn 2	• Visualising and constructing • Investigating properties of shape. • Exploring Fractions, Decimals and Percentages	Building on these skills: • Knowing the names of common 2D and 3D shapes • Use a protractor to measure and draw angles • Use a ruler accurately • Fractions as pictures • Knowing basic fraction, decimal and percentage equivalence	
	Spring 1	• Algebraic Proficiency: Tinkering • Proportional Reasoning • Sequences	Building on these skills: • Order of operations • Count forwards and backwards in10, 100, and 1000. • Count backwards and forwards through 0	

	Spring 2	• Measuring Space • Investigating Angles • Calculating Fractions, Decimals and Percentages	Building on these skills • Convert between units of time • Convert between basic units of measure • Know that angles are measured in degrees. • Know that angles on a straight add to 180^{o} and angles around a point add to 360^{o} • Covert between mixed and improper fractions • Find equivalent fractions	
	Summer 1	• Solving Equation and Inequalities • Calculating Space • Mathematical Movement	Building on these skills • Use symbols to represent variables • Knowing the meaning of perimeter • Know how to find the area of a rectangle. • Know the units of measurement for area and volume • Translate shapes in the first quadrant. • Reflect in mirror lines	
	Summer 2	• Presentation of Data • Measuring Data	Building on these skills • Measure and construct angles using a protractor Interpret and construct a simple line graph • Drawing tally charts • Round numbers • Calculate the mean	
8	Overview	In year 8 we continue developing topics from year 7, looking into more depth and application. We also introduce some new aspects of Maths such as Algebraic graphs and probability.		Number Algebra Geometry Data handling Ratio and proportion Problem solving and reasoning
	Autumn 1	• Numbers and the number system • Calculating	Building on these skills • Know how to find common multiples of two given numbers by listing • Know how to find common factors of two given numbers by listing • Recall multiplication facts to 12 × 12 and associated division facts • Written methods for long multiplication • Written methods for short division	

	Autumn 2	• Checking, approximating and estimating • Counting and comparing • Visualising and constructing • Investigating properties of shape	Building on these skills • rounding to the nearest 10, 100 or 1000, 10 000, 100 000 or 1 000 000 • Round to the nearest whole number • Round to 1 decimal place • Order decimals and fractions greater than 1 • Measure and draw angles. • Know names of 3D shapes. • Know the meaning of faces, edges and vertices. • Know the meaning of parallel and perpendicular	
	Spring 1	• Algebra simplifying • Exploring fractions, decimals and percentages • Proportional reasoning • Sequences • Measuring space	Building on these skills • Substitute numbers into worded formulae. • Know some decimal and percentage equivalence • Convert between common imperial units of measure • Convert between units of time • Know the vocabulary of sequences • Find the next term in a linear sequence Find a missing term in a linear sequence • Generate a linear sequence from its description	
	Spring 2	• Investigating angles • Calculating fractions, decimal and percentages • Solving equations and inequalities	Building on these skills • Knowing that vertically opposite angles are equal • Know the names of special quadrilaterals and triangles. • Add and subtract mixed numbers with different denominators • Multiply a proper fraction by a proper fraction • Divide a proper fraction by a whole number • Know the basic rules of algebraic notation	
	Summer 1	• Calculating space • Algebraic graphs • Mathematical movement	Building on these skills • Understand the meaning of area, perimeter, volume and capacity • Know how to calculate areas of rectangles, parallelograms and triangles using the standard formulae • Work with coordinates in all four quadrants • Carry out a reflection in a given vertical or horizontal mirror line • Carry out a translation	

	Summer 2	• Probability • Presentation of data • Measuring data	Building on these skills • Understand the equivalence between fractions, decimals and percentages • Compare fractions, decimals or percentages • Construct and interpret a pictogram, bar chart and line graph • Understand that pie charts are used to show proportions • Understand the meaning of 'average'	
9	Overview	In year 9 there are some further continued topics from year 8, consistently building on the knowledge from previous years.		Number Algebra Geometry Data handling Ratio and proportion Problem solving and reasoning
	Autumn 1	• Numbers and the number system • Calculating	Building on these skills • Recall prime numbers up to 50 • Understand the use of notation for powers • Know how to identify the first significant figure in any number • Apply the four operations with fractions and mixed numbers • Convert between an improper fraction and a mixed number • Know the order of operations for the four operations and brackets	
	Autumn 2	• Visualising and constructing • Algebra Simplifying • Exploring fractions decimal and percentages	Building on these skills • Understand the concept of an enlargement (no scale factor) • Use ruler and protractor to construct triangles, and other shapes, from written descriptions • Simplify an expression by collecting like terms • Know how to multiply a single term over a bracket • Understand that fractions, decimals and percentages are different ways of representing the same proportion	

	Spring 1	• Proportional reasoning • Sequences • Solving equations 1	Building on these skills • Understand and use ratio notation • Divide an amount in a given ratio • Use a term-to-term rule to generate a sequence • Find the term-to-term rule for a sequence • Describe a sequence using the term-to-term rule • Choose the required inverse operation when solving an equation • Solve linear equations by balancing when the solution is a whole number or a fraction	
	Spring 2	• Investigating angles • Calculating fractions, decimals and percentages • Solving equations 2	Building on these skills • Use angles at a point, angles at a point on a line and vertically opposite angles to calculate missing angles in geometrical diagrams • Know that the angles in a triangle total 180° • Use calculators to find a percentage of an amount using multiplicative methods • Choose the required inverse operation when solving an equation • Solve linear equations by balancing when the solution is a whole number or a fraction	
	Summer 1	• Calculating space • Algebraic graphs	Building on these skills • Know how to use formulae to find the area of rectangles, parallelograms, triangles and trapezia • Know how to find the area of compound shapes • Write the equation of a line parallel to the x-axis or the y-axis	
	Summer 2	• Probability • Presentation of data • Measuring data	Building on these skills • Understand the use of the 0-1 scale to measure probability • Work out theoretical probabilities for events with equally likely outcomes • Know how to represent a probability • Know that the sum of probabilities for all outcomes is 1 • Know the meaning of discrete data • Interpret and construct frequency tables • Find the mean, median, mode and range from a frequency table	

10	Autumn 1	**Higher** • Investigating properties of shapes • Calculating • Solving equations and inequalities 1	**Higher** Building on these skills • Understand and work with similar shapes • Solve linear equations, including those with the unknown in the denominator of a fraction • Understand and use Pythagoras' theorem • Calculate with positive indices using written methods and negative indices in the context of standard form • Know the multiplication and division laws of indices • Round to a given number of decimal places or significant figures • Identify the minimum and maximum values of an amount that has been rounded (to nearest x, x d.p., x s.f.) • Solve two linear simultaneous equations in two variables in simple cases (multiplication of one equation only required)	Number Algebra Geometry Data handling Ratio and proportion Problem solving and reasoning
		Foundation • Calculating space • Calculating • Solving equations and inequalities 1	**Foundation** Building on these skills • Know how to use formulae to find the area of rectangles, parallelograms, triangles and trapezia • Know how to find the area of compound shapes • Know the meaning of powers • Know the meaning of roots • Know the multiplication and division laws of indices • Understand and use standard form to write numbers • Interpret a number written in standard form • Round to a given number of decimal places or significant figures • Know the meaning of the symbols <, >, ≤, ≥ • Choose the required inverse operation when solving an equation • Solve linear equations by balancing when the solution is a whole number or a fraction.	

	Autumn 2	**Higher** • Mathematical movement 1 • Algebraic proficiency: tinkering • Proportional reasoning	**Higher** Building on these skills • Use the centre and scale factor to carry out an enlargement of a 2D shape with a positive integer scale factor • Use the concept of scaling in diagrams • Carry out reflection, rotations and translations of 2D shapes • Calculate with negative numbers • Multiply two linear expressions of the form $(x \pm a)(x \pm b)$ • Factorise a quadratic expression of the form $x^2 + bx + c$ • Change the subject of a formula when two steps are required • Know the difference between direct and inverse proportion • Know the features of a graph that represents a direct or inverse proportion situation • Know the features of an expression (or formula) that represents a direct or inverse proportion situation • Understand the connection between the multiplier, the expression and the graph	
		Foundation • Mathematical movement 1 • Algebraic proficiency: simplifying • Proportional reasoning	**Foundation** Building on these skills • Work with coordinates in all four quadrants • Carry out a reflection in a given vertical or horizontal mirror line • Carry out a translation • Manipulate expressions by collecting like terms • Know that $x \times x = x^2$ • Calculate with negative numbers • Know the grid method for multiplying two two-digit numbers • Know the difference between an expression, an equation and a formula • Basic ratio work, Best Buys, Recipes • Find a relevant multiplier in a situation involving proportion • Plot the graph of a linear function • Understand the meaning of a compound unit • Convert between units of length, capacity, mass and time	

	Spring 1	**Higher** • Sequences • Solving equations and inequalities 2 • Calculating space	**Higher** Building on these skills • Find the nth term for a linear sequence • Identify quadratic sequences • Understand the meaning of the four inequality symbols • Use a formal method to solve an inequality in one variable • Plot graphs of linear functions stated explicitly • Calculate exactly with multiples of π • Know and use the formula for area and circumference of a circle • Know how to use formulae to find the area of rectangles, parallelograms, triangles, trapezia, circles, sectors and • Know how to find the area of compound shapes • Know how to find the surface area of a right prism and a cylinder • Calculate the surface area of a right prism and a cylinder • Carry out an enlargement • Find the scale factor of a given enlargement • Use Pythagoras' theorem to find missing lengths in right-angled triangles	
		Foundation • Sequences • Solving equations and inequalities 2 • Calculating space	**Foundation** Building on these skills • Generate a linear sequence from its nth term • Substitute positive numbers into quadratic expressions • Find the nth term for an increasing linear sequence • Find the nth term for a decreasing linear sequence • Understand the meaning of the four inequality symbols • Solve linear equations including those with unknowns on both sides • Know and use the number π • Know and use the formula for area and circumference of a circle • Know how to use formulae to find the area of rectangles, parallelograms, triangles and trapezia • Know how to find the area of compound shapes	

	Spring 2	**Higher** • Conjecturing • Algebra graphs	**Higher** Building on these skills • Know the vocabulary of circles • Know angle facts including angles at a point, on a line and in a triangle • Know angle facts involving parallel lines and vertically opposite angles • Know the properties of special quadrilaterals • Plot graphs of linear, quadratic, cubic and reciprocal functions • Interpret the gradient of a straight line graph as a rate of change • Plot and interpret graphs of kinematic problems involving distance and speed	
		Foundation • Conjecturing • Algebra graphs	**Foundation** Building on these skills • Know angle facts including angles at a point, on a line and in a triangle • Know angle facts involving parallel lines and vertically opposite angles • Know the properties of special quadrilaterals • Know Pythagoras' theorem • Plot straight-line graphs • Interpret gradients and intercepts of linear functions graphically and algebraically • Recognise, sketch and interpret graphs of linear functions • Recognise graphs of simple quadratic functions • Plot and interpret graphs of kinematic problems involving distance and speed	
	Summer 1	**Higher** • Fractions, decimals and percentages • Solving equations and inequalities 3 • Probability	**Higher** Building on these skills • Identify if a fraction is terminating or recurring • Move freely between terminating fractions, decimals and percentages • Use a multiplier to calculate the result of percentage changes • Manipulate linear equations • Factorise a quadratic expression • Know when to add two or more probabilities • Know when to multiply two or more probabilities • Convert between fractions, decimals and percentages • Use a tree diagram to calculate probabilities of dependent and independent combined events	

		Foundation • Fractions, decimals and percentages • Solving equations and inequalities 3 • Probability	**Foundation** Building on these skills • Apply the four operations to proper fractions, improper fractions and mixed numbers • Use calculators to find a percentage of an amount using multiplicative methods • Identify the multiplier for a percentage increase or decrease • Use calculators to increase (decrease) an amount by a percentage using multiplicative methods • Know that percentage change = actual change ÷ original amount • Solve linear equations • Substitute numbers into formulae • Plot graphs of functions of the form $y = mx + c$, $x \pm y = c$ and $ax \pm by = c$) • Manipulate expressions by multiplying by a single term • Add fractions (decimals) • Multiply fractions (decimals) • Convert between fractions, decimals and percentages • Use frequency trees to record outcomes of probability experiments • Use experimental and theoretical probability to calculate expected outcomes	
	Summer 2	**Higher** • Analysing statistics • Algebraic proficiency: visualising 2 • Mathematical movement	**Higher** Building on these skills • Know the meaning of discrete and continuous data • Interpret and construct frequency tables • Analyse data using measures of central tendency • Use the form $y = mx + c$ to identify parallel lines • Rearrange an equation into the form $y = mx + c$ • Find the equation of a line through one point with a given gradient • Find the equation of a line through two given points • Translations • Understand column vector notation	

		Foundation • Presentation of data • Mathematical movement 2 • Visualising and constructing	**Foundation** Building on these skills • Know the meaning of discrete and continuous data • Interpret and construct frequency tables • Construct and interpret pictograms, bar charts, pie charts, tables, vertical line charts, histograms (equal class widths) and scatter diagrams • Understand column vector notation • Measure distances to the nearest millimetre • Create and interpret scale diagrams • Use compasses to draw circles • Interpret plan and elevations	
11	Autumn 1	**Higher** • Investigating properties of shapes • Calculating • Solving equations and inequalities 1 • Mathematical movement	**Higher** Building on these skills • Apply Pythagoras' theorem in two dimensions • Know the trigonometric ratios, $\sin\theta = \text{opp/hyp}$, $\cos\theta = \text{adj/hyp}$, $\tan\theta = \text{opp/adj}$ • Choose an appropriate trigonometric ratio that can be used in a given two-dimensional situation • Set up and solve a trigonometric equation to find a missing side or angle in a right-angled triangle • Calculate exactly with surds • Use the functionality of a scientific calculator when calculating with roots and powers • Solve a quadratic equation by rearranging and factorising • Identify when a quadratic equation cannot be solved by factorising • Calculate fluently with negative numbers • Rearrange algebraic expressions and equations • Understand and use interval bisection • Rearrange an equation • Use the centre and scale factor to carry out an enlargement of a 2D shape with a positive scale factor	Number Algebra Geometry Data handling Ratio and proportion Problem solving and reasoning

		Foundation • Investigating properties of shapes • Calculating • Solving equations and inequalities • Mathematical movement	Foundation Building on these skills • Understand and work with similar shapes • Solve linear equations, including those with the unknown in the denominator of a fraction • Understand and use Pythagoras' theorem • Calculate roots and powers with and without a calculator • Change to numbers to standard form • Be able to use calculator for standard form problems • Calculate with positive indices using written methods and negative indices in the context of standard form • Know the multiplication and division laws of indices • Solve linear equations including letters on both sides • Substation into expressions and formula • Solve equations graphically • Use the centre and scale factor to carry out an enlargement of a 2D shape with a positive integer scale factor • Use the concept of scaling in diagrams • Carry out reflection, rotations and translations of 2D shapes • Find the scale factor of a given enlargement	

	Autumn 2	Higher • Algebra Simplifying • Proportional reasoning • Sequences • Solving equations and inequalities 2	Higher Building on these skills • Given a function, establish outputs from given inputs • Given a function, establish inputs from given outputs • Use a mapping diagram (function machine) to represent a function • Use an expression to represent a function • Recognise a graph that illustrates direct or inverse proportion • Interpret equations that describe direct or inverse proportion • Understand that X is inversely proportional to Y is equivalent to X is proportional to 1/Y • Solve problems which include finding the multiplier in a situation involving direct or inverse proportion • Understand the difference between an arithmetic progression, a quadratic sequence and a geometric progression • Recognise a simple geometric progression • Find the next three terms in a geometric progression • Find a given term in a simple geometric progression • Describe a geometric progression • Use a formal method to solve a linear inequality • Show a range of values that solve an inequality on a number line • Sketch a graph of a quadratic functions • Find the roots of a quadratic function • Solve two linear simultaneous equations in two variables by substitution • Solve two linear simultaneous equations in two variables by elimination (multiplication of both equations required)	

		Foundation • Algebra Simplifying • Proportional reasoning • Sequences • Calculating space 2	**Foundation** Building on these skills • Calculate with negative numbers • Multiply two linear expressions of the form $(x \pm a)(x \pm b)$ • Factorise a quadratic expression of the form $x^2 + bx + c$ • Know the difference between direct and inverse proportion • Recognise direct or inverse proportion in a situation • Know the features of a graph that represents a direct or inverse proportion situation • Know the features of an expression (or formula) that represents a direct or inverse proportion situation • Understand the connection between the multiplier, the expression and the graph • Find the nth term for an increasing linear sequence • Find the nth term for and decreasing linear sequence • Calculate exactly with multiples of π • Know and use the formula for area and circumference of a circle • Know how to use formulae to find the area of rectangles, parallelograms, triangles, trapezia, circles, sectors and • Know how to find the area of compound shapes • Know how to find the surface area of a right prism and a cylinder • Calculate the surface area of a right prism and a cylinder • Use Pythagoras' theorem to find missing lengths in right-angled triangles	

	Spring 1	**Higher** • Algebra graphs • Analysing statistics • Visualising 2 • Movement 2	**Higher** Building on these skills • Recognise, plot and interpret exponential graphs • Plot graphs of linear, quadratic, cubic and reciprocal functions • Find sines, cosines and tangents of given angles • Know the meaning of continuous data • Understand and use grouped frequency tables • Interpret histograms for grouped data with equal class intervals • Complete the square for a given quadratic expression • Know the meaning of roots, intercepts and turning points • Identify and interpret roots, intercepts, turning points of quadratic functions graphically • Interpret the gradient at a point on a curve as the instantaneous rate of change • Know the effects of transforming the graph y = f(x): f(x) + a and f(x + a) • Understand the concept of a vector • Use diagrammatic representation of vectors • Know and use different notations for vectors • Add and subtract vectors • Multiply a vector by a scalar	
		Foundation • Exploring fractions decimals and percentages • Algebraic graphs • Solving equations and inequalities 2 • Analysing statistics • Mathematical movement 2	**Foundation** Building on these skills • Move freely between terminating fractions, decimals and percentages • Use a multiplier to calculate the result of percentage changes • Plot graphs of linear, quadratic, cubic and reciprocal functions • Plot and interpret graphs of kinematic problems involving distance and speed • Manipulate linear equations • Factorise a quadratic expression of the form $x^2 + bx + c$ • Factorise a quadratic expression of the form $ax^2 + bx + c$ • Make connections between a linear equation and a graph • Know the meaning of discrete and continuous data • Interpret and construct frequency tables • Analyse data using measures of central tendency • Understand column vector notation	

	Spring 2	Higher Revision based on QLAs from mock exams	Higher	
		Foundation Revision based on QLAs from mock exams	Foundation	
	Summer 1	Higher Revision based on QLAs from mock exams	Higher	
		Foundation	Foundation	
	Summer 2	Higher Revision based on QLAs from mock exams	Higher	
		Foundation	Foundation	

	Information
Personal Development within the Curriculum	In Maths lessons students are always encouraged to delve deeper into their understanding of Mathematics and how it relates to the world around them. Problem solving skills and team work are fundamental to Mathematics, through creative thinking, discussion, explaining and presenting ideas. Students are always encouraged to develop their Mathematical reasoning skills, communicating with others and explaining concepts to each other. Self and peer reviewing are very important to enable students to have an accurate grasp of where they are and how they need to improve.
Extra Curricular Opportunities	National Mathematics Challenge for students who show very good problem solving skills. Maths Challenges and House Competitions Hegarty Leader Board KS3 Games club
Assessment	**Key Stage 3** • Student are assessed regularly on subject knowledge and their ability to recall and apply key mathematical facts and vocabulary. • Students are also assessed on their understanding of subject specific knowledge and their application of this knowledge to a range of problems. How it is assessed? • Students recall is tested regularly throughout lessons and there is opportunity for recall at the beginning of every lesson. • Live marking takes place in every lesson, where work completed is regularly assessed by teachers to ensure that misconceptions to be dealt with immediately. • Students in year 7 and year 8 complete retrieval quizzes at regular intervals throughout the year. These test pupils understanding of the fundamental maths knowledge. • Students complete formal assessments throughout to test their ability to apply the knowledge that they have acquired to a range of questions. When it is assessed? • Informal assessments occur during every lesson • Year 7 and 8 diagnostic quizzes take place at regular intervals throughout the year. • Formal assessments take place at the end of each half term in the Autumn and Spring terms. A final assessment will take place in Summer term. **Key Stage 4** Title of course studied: Edexcel GCSE Mathematics Course Content and assessment information: Content from any part of the specification may be assessed. A mix of question styles, from short, single-mark questions to multi-step problems. The mathematical demand increases as a student progresses through the paper. Each paper is worth $33\frac{1}{3}$% of the GCSE mathematics assessment. Paper 1 – Non Calculator (90 mins) Paper 2 – Calculator (90 mins)

	Paper 3 – Calculator (90 mins)
Qualification Information	https://qualifications.pearson.com/content/dam/pdf/GCSE/mathematics/2015/specification-and-sample-assesment/gcse-maths-2015-specification.pdf
Ways to Support your Child in this subject	• Encourage the use of Hegarty maths. Each pupil has their own individual log in and they are given Hegarty topics that they need to work on from each assessment. • Ensure that your child completes their homework on time. • Encourage your child to revisit key knowledge regularly. At GCSE • Continue to encourage the use of Hegarty maths • Encourage your child to complete past papers, these are available on Ello and all on MathsGenie.co.uk