Mathematics Unit Overview Year 10

Students in year 10 will follow a Higher or Foundation scheme of learning in preparation for the tier of entry they are likely to be entered for at GCSE. This will not be finalised until year 11 but will familiarise students with the level of challenge the tier provides. This builds on the skills and understanding they have mastered in years 7, 8 and 9 in addition to introducing them to several new topics not previously seen. Students are placed in sets which enable us to work at a pace right for individual students, focusing on key knowledge and possible misconceptions while ensuring all students are challenged.

Our curriculum gives frequent opportunities for discussion of methods and deep thinking, both as a class and in small groups. Exam style question practice is embedded within each unit at all levels and ensures students achieve fluency in both familiar and unfamiliar contexts. Skills practice is pitched at the right level for individual students with opportunity to stretch and challenge.

Students regularly practice key skills and previously seen material through weekly Maths Box starters. They are encouraged to assess their own success in these starters and to be proactive about topics they are less confident with.

Half termly tests enable staff to identify misconceptions once topics have been covered and address these in lessons. These also allow students to reflect on previous learning throughout the year. A full mock exam paper will also be sat during the final term of year 10 followed by question level analysis to enable staff to target homework tasks during year 11.

Students are given opportunities to explore a variety of revision and recall techniques prior to formal assessments.

Formal assessments are followed by test-audits which enable students to identify areas for improvement and resources are provided throughout to aid them in making improvements.

Knowledge - refers to information or awareness gained through experience or education. It is the facts we are taught.

Understanding - when the facts/knowledge are placed into a wider context, such as realizing the intended meaning or cause.

Mastery - keeps learning outcomes constant but varies the time needed for pupils to become proficient or competent at these objectives. Mastery learning breaks subject matter and learning content into units with clearly specified objectives which learners work through in a series of sequential steps and must demonstrate a high level of success, typically about 80%.

Year 11 Mathematics Curriculum Statement

We will begin year 10 Foundation with a unit which naturally revises many concepts around proportional reasoning, rounding, estimating and number skills whilst applying these skills in a real - life context.

Year 10 Higher will begin with relatively independent topics, Pythagoras' Theorem and trigonometry. This unit will enable revision of some key techniques around rearranging formulae and substitution, and number skills, while applying knowledge in a relatively new context.

Students understanding will be determined through low stakes quizzes, multi topic starters, mini-whiteboard work, and questioning. Time to re-discover revision techniques will also form part of the re-introduction to formal testing.

The spiraling nature of the curriculum will give us opportunities to re-visit the topics students experienced during school closure as well as re-visit skills that are required across a range of topics.

Key topics which we will bridge any gaps in understanding of during year 10 include:

Foundation
Collecting like terms
Substitution
Expanding and factorising brackets
Rearranging formulae
Rounding and estimating
Decimal calculations
Fraction Decimal and Percentage conversions
Fraction Calculations
Perimeter and area, rectangle, triangle, parallelogram

Higher
Area and circumference of a circle
Area of parallelogram, trapezium
Arc length and area of a sector
Volume of a prism and cylinder, rectangular based pyramid, sphere
Surface area of a cylinder, cone and a sphere
Straight line graphs, gradient, intercept, parallel and perpendicular

Mathematics - Year 10 Foundation Unit 1

What are we learning?	What knowledge, understanding and skills will we gain?	What does mastery look like?	How does this build on prior learning?	What additional resources are available?
Perimeter and area	Knowledge: Method for working out the perimeter of polygons. Formula for the area of a rectangle, triangle, parallelogram, and trapezium. Properties of quadrilaterals and triangles. Circle terminology. Formula for the area and circumference of a circle. Understanding: Work out the area and perimeter for a compound shape. Apply properties of quadrilaterals and triangles to solve problems involving missing lengths of sides. Able to answer circle questions in terms of Pi and exactly. Skills: Using formulae. Re-arranging formulae. Breaking down compound shapes.	Students can: Consistently select and use the correct formula to work out the area and perimeter of rectangles, triangles, parallelograms, and trapeziums. Apply their knowledge of properties of quadrilaterals and triangles to find the length of a missing side. Accurately apply the formulae learned to work out the area and circumference of a circle. apply their knowledge of individual shapes to find the area or perimeter of a compound shape. Work backwards from a given area or perimeter to find a missing value.	Y7 Unit 6: Properties of Quadrilaterals, Properties of Triangles Y7 Unit 11: Converting Metric Measures Y8 Unit 12: Parts of the Circles, area and circumference of a circle Y9 Unit 2: Converting metric and imperial measures Y9 Unit 9: Using Formula	• Collins Foundation textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Foundation Unit 2				
What are we learning?	What knowledge, understanding and skills will we gain?	What does mastery look like?	How does this build on prior learning?	What additional resources are available?
Transformations	Knowledge: The method for translating a shape or point by a vector. A method to reflect a 2-D shape by a mirror line. Knowing the order of rotation of a shape. A method to rotate a 2-D shape around a point. Methods to enlarge a shape by positive numbers and fractions. Different ways to represent vectors Methods to add and subtract vectors. Understanding: Apply the correct method to a given transformation. Determine what transformation has occurred and describe this using appropriate language. Apply multiple transformations on a single 2-D shape. Describe the resultant vector of getting from one point to another in a grid/shape problem. Skills: Reading and writing co-ordinates. Reading and writing vector directions. Reading graphs and drawing linear lines. Performing and describing transformations.	Students can: translate a shape or point by a vector and determine by what vector a shape or point has translated by. reflect a shape on a given mirror line including the line y=x and y=-x. rotate a 2-D shape around a given point of rotation. determine the order of rotation and rotational symmetry of a 2-D shape. accurately enlarge a shape from a centre of enlargement by a positive or fractional scale factor. determine the original centre of enlargement and scale factor of an enlarged shape. Consistently select the correct method to transform a 2-D shape Consistently select the appropriate description of a transformation. accurately transform a 2-D shape by 2 or more transformations at once. accurately describe the vector of getting to one point to another on a grid/shape diagram.	Y7 Unit 5: Rotational Symmetry of shapes Y7 Unit 16: Plot and read co-ordinates on a graph with x and y axes, drawing lines on graphs, reflections, translations, Y8 Unit 3: Centre of Enlargement, enlargement factor (positive and negative) Y9 Unit 12: Equations of Lines	• Collins Foundation textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics Curriculum Unit Overview Higher Year 10

Mathematics - Year 10 Higher Unit 1				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Right-angled triangles	Knowledge: The formula for Pythagoras' Theorem; know the 3 trigonometric ratios sin, cos and tan; know how to calculate bearings and how they work; know the difference between angles of elevation and depression Understanding: Be able to adapt Pythagoras theorem when needing to calculate the length of any side; choose the correct trigonometric ratio for the given question/context; understand the 3 trigonometric ratios in order to rearrange when needed depending if a missing side or angle is required; understand how to extend knowledge of bearings for use with trigonometric problems; adapt methods for use in isosceles non right-angled triangles Skills: find the length of a missing side using Pythagoras' theorem in 2d and 3d; find the missing length/angle using trigonometric ratios; able to use the trigonometric functions on a calculator; solve practical problems using trigonometry; solve problems using angles of elevation or depression; solve bearings problems using trigonometry.	Students can: Consistently and accurately able to choose and use the correct trig ratio to solve problems Adapt Pythagoras to use in non-standard contexts Independently rearrange trig ratios when needed and know how to adapt when calculating missing sides or angles Solve practical trigonometry problems and those that are non-standard Calculate angles of elevation and depression Solve bearing problems using trigonometry Adapt trig methods for use with a non-right-angled isosceles triangle Deduce the trigonometric area of a triangle formula Identify and rectify an error in a calculation Answer 'Show that' questions Perhaps able to deduce some exact trig values without a calculator	Year 9 Unit 1: Calculating square and square roots; rounding to a given/appropriate degree of accuracy. Year 9 Unit 9: Properties of triangles; Angle facts and angles in triangles; scale drawings and bearings. Year 9 Unit 4: Basic algebra skills and changing the subject of a formula.	• Collins Higher textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Higher Unit 2				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Similarity	Knowledge: Definition of similarity Ratio of length : area : volume Understanding: Able to work out the scale factor for two similar shapes Able to work out lengths of sides in similar shapes Able to work out areas and volumes of similar shapes Skills: Show that two triangles are similar and work out the scale factor between them Solve problems involving the area and volume of similar shapes	Students can: Work out the ratios between two similar shapes Work out unknown lengths, areas and volumes of similar 3D shapes Solve practical problems using similar shapes Solve problems using area and volume ratios	Y8 Unit 3: Enlarge a shape by a positive integer or a fraction Y9 Unit 5: Define and simplify a ratio; complete calculations from a given ratio and partial information; solve problems involving direct proportion Y9 Unit 10: Enlarge a 2D shape Y9 Unit 11: Calculating areas and volumes of 2D and 3D shapes	• Collins Higher textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics Curriculum Unit Overview Foundation and Higher
Year 10

Mathematics - Year 10 Foundation Unit 3				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Probability and events	Knowledge: Language of probability. Using a scale to show the probability of an event happening. How to work out the probability of an event happening. Recognise mutually exclusive events and exhaustive outcomes. How to work out experimental probabilities and relative frequencies from an experiment. Able to systematically list all outcomes of an event. Understanding: Work out the probability of an event not happening. Apply knowledge of probabilities to predict how many times you would expect an event to happen. Determine if a dice, spinner, etc., is biased based on the relative frequency/experimental probability data. Skills: Able to create sample spaces. Reasoning.	Students can: use a scale to represent the probability of an event happening. represent the probability of an event happening, or not happening, as a decimal and fraction. explain what mutually exclusive event and exhaustive outcomes are. work out the experimental probability and relative frequency of an event based on a set of data. use probability to predict how many times an event is likely to happen over a set number of trials. using experimental probability and relative frequency, determine if a dice, spinner, etc., is biased. systematically work to list all outcomes of an event, displaying this on a sample space.	Y8 Unit 4: Vocabulary of probability, using a scale to show probability, listing outcomes, sample spaces, theoretical probability, experimental probability, expected outcomes Y9 Unit 7: Working with Decimals and Fractions	• Collins Foundation textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics -Year 10 Higher Unit 3				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Exploring and applying probability	Knowledge: Difference between theoretical and experimental probability Recognition of mutually exclusive, exhaustive and complementary outcomes How to read and complete a two-way table How to complete a Venn diagram including set notation Understanding: Work out probabilities using theoretical or experimental models Predict the likely number of successes given the number of trials and the probability Skills: Apply two-way tables to probability problems Apply Venn diagrams to probability problems	Students can: Work out experimental probabilities and relative frequencies. Use different methods to estimate probabilities. Recognise mutually exclusive, exhaustive, and complementary events. Know how to predict the likely number of successful outcomes, given the number of trials and the probability of any one outcome. Read two-way tables and use them to work out probabilities understand set notation.	Y8 Unit 4: Understanding risk 1 Y8 Unit 13: Understanding risk 2 Y9 Unit 6: Probability Y9 Unit 7: Fractions, Decimals and Percentages	• Collins Higher textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Foundation Unit 4				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Volumes and surface areas of prisms	Knowledge: 3-D Shape Names and Terminology. Formulae for the surface area and volume of a cuboid, prism, and cylinders. Understanding: Solving problems involving capacity/volume. Select the appropriate formula to use when calculating surface area and volume. Calculate the volume and surface area for compound prisms. Skills: Substituting into formula. Re-arranging formula.	Students can: Discuss 3-D shapes using the correct terminology. Recall the formula for volume of a cuboid, prism and cylinder, from memory. Find the volume and surface area for cuboids, prisms, and cylinders. Apply their knowledge to calculate volume and surface area for compound prisms. Solve problems involving 3-D shapes and capacity/volume, such as how many cubes will fit in a larger cuboid.	Y7 Unit 5: Properties of quadrilaterals, triangles, and 3-D shapes. Nets of 3-D shapes. Y7 Unit 15: Area of 2-D shapes. Volume and surface area of a cuboid. Y8 Unit 12: Circle terminology, area and circumference of circle, volume of prisms and cylinders. Y9 Unit 11: Area and perimeter Y10 Foundation Unit 1: Area and Perimeter	• Collins Foundation textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Higher Unit 4

What are we learning?	What knowledge, understanding and skills will we gain?	What does mastery look like?	How does this build on prior learning?	What additional resources are available?
Powers and standard form	Knowledge: Use a calculator to work out powers Recognition of numbers not written in correct standard form Understanding: Apply knowledge of multiplying and dividing by powers of 10 to answer related calculations Calculate with standard form, giving an answer in accurate standard format Skills: Problem solve by applying knowledge of standard form	Students can: Write and calculate with numbers written in index form Multiply and divide numbers written in index form Write ordinary numbers in standard form and vice versa Use standard form to calculate in a variety of problems,	Y7 Unit 1: Square and cube roots Y7 Unit 2: Multiplying and dividing by powers of 10 Y8 Unit 1: Writing numbers in standard form; converting between standard form and ordinary numbers Y8 Unit 5: Laws of indices: multiplication, division, zero and powers (brackets)	• Collins Higher textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

What are we learning?	What knowledge, understanding and skills will we gain?	What does mastery look like?	How does this build on prior learning?	What additional resources are available?
Algebra: Linear equations	Knowledge: Methods to solve linear equations including with brackets. Methods to solve linear equations with the unknown on both sides. To set up linear equations Understanding: To work in clear steps. To apply previous knowledge to solve linear equations. To interpret information and place into an equation. Skills: To problem solve always showing clear working.	Students can: Identify and rectify an error in a calculation Check solutions are correct by substituting into the original equation. Solve any linear equation for a single missing variable link to problem solving in science and other subjects. Solve multi step problems in a clear and logical way.	Y7 Unit 14: To know inverse operations; The basic language of algebra. Ie. 7x means 7 multiplied by x. To be able to expand brackets and gather like terms. Y8 Unit 11: solve linear equations with whole number and fractional answers, including when the variable is on both sides. Y9 Unit 4: simplifying algebraic expressions	• Collins Foundation textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Higher Unit 5

What are we learning?	What knowledge, understanding and skills will we gain?	What does mastery look like?	How does this build on prior learning?	What additional resources are available?
Equations and inequalities	Knowledge: Identify inverse operations Identify the solution to linear simultaneous equations as their point of intersection Recognise inequalities Identify inequalities on a number line Understanding: Set up equations from given information Solve linear equations involving fractions, brackets, variables on both sides Solve linear simultaneous equations Solve linear inequalities and represent solutions on a number line Represent the solution to one or more linear inequality(ies) on a graph Skills: Represent a worded problem as a set of simultaneous equations Represent a worded problem as one or more inequalities	Students can: Solve linear equations containing brackets and fractions and where the variable appears on both sides Set up and solve linear equations from practical and real-life situations Solve inequalities and represent solutions on a number line Solve linear simultaneous equations by balancing, substituting and elimination Represent a region that satisfies a linear inequality graphically, and solve more complex linear inequalities Represent a region that simultaneously satisfies more than one linear inequality graphically	Y7 Unit 4: Compare numbers using inequality signs Y7 Unit 14: Solve one and two- step equations, including the use of brackets, when the solution is a whole number or fraction Y8 Unit 5: Change the subject of an equation or formula Y8 Unit 1:1 Solve linear equations where the solution is negative; solve linear equations with the unknown on both sides where the solution is a whole number or fraction Y8 Unit 13: Plotting linear graphs Y9 Unit 4: Substitute numbers into expressions and formulae; rearrange formulae Y9 Unit 13: Drawing linear graphs	• Collins Foundationtextbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Foundation Unit 6				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Percentages and compound measures	Knowledge: Methods to convert between fractions, decimals & percentages Use a percentage multiplier Work out one quantity as a percentage of another Formulae for compound measures (rates of pay, density, pressure) Understanding: Choose the correct multiplier and method for worded problems. Use formulae for compound measures to work out any missing value. Skills: Operate a calculator correctly Simplify fractions Multiply and divide without a calculator Substitute into expressions	Students can: Convert fluently between fractions, decimals and percentages Consistently apply the correct multiplier to a percentage increase or decrease problem Use compound measures in multi- step questions, particularly where for example, two parts of a journey are combined Use algebra to represent unknown percentages Find an answer with the minimum number of steps on a calculator Apply knowledge to problems involving ratio and proportion	Y7 Unit 4: Comparing integers, fraction and decimals Y7 Unit 8: Fractions as a quantity of another. Y8 Unit 10: Interpret fractions and percentages as operators; work with percentages greater than 100%; Solve problems involving percentage change, including original value problems, simple interest; calculate exactly with fraction Y8 Unit 7: Understand and use compound units; Convert between compound units; Solve problems involving speed; Solve problems involving rates of pay and unit Pricing Y9 Unit 8: Fractions, Decimals and Percentages	• Collins Foundation textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

What are we learning?	What knowledge, understanding and skills will we gain?	What does mastery look like?	How does this build on prior learning?	What additional resources are available?
Counting, accuracy, powers and surds	Knowledge: Identify terminating and recurring decimals Know the difference between a rational and irrational number Interpret a negative or fractional power Understanding: Find the reciprocal of a rational number Convert between recurring decimals and fractions and vice versa Estimate powers and roots of positive numbers Calculate with surds Calculate the error interval for rounded numbers Use the product rule for counting Skills: Apply surds to problem solving Calculate the limits of accuracy of a calculation Calculate the number of choices and permutations in real-life situations	Students can: Convert any decimal into a fraction and vice versa, selecting the appropriate method Manipulate positive, negative and fractional indices Find measures of accuracy for numbers given to whole number, decimal place and significant figure accuracy Estimate powers and roots of any given positive number Consistently perform the four operations with surds accurately. Simplify surds including expanding brackets and rationalising denominators Calculate the limits of compound measures Use the product rule or systematic counting strategy as appropriate to work out choices, arrangements and outcomes	Y7 Unit 3: Round numbers to a specified degree of accuracy; estimate calculations by rounding to 1sf Y7 Unit 13: Dividing proper fractions Y8 Unit 5: Laws of indices Y8 Unit 6: Convert between terminating fractions and decimals and vice versa; convert a fraction into a recurring decimal Y9 Unit 1: Approximation of calculations; powers and roots Y9 Unit 2: Dividing fractions Y10 Higher Unit 4: Laws of indices	• Collins Higher textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Foundation Unit 7

What are we learning?	What knowledge, understanding and skills will we gain?	What does mastery look like?	How does this build on prior learning?	What additional resources are available?
Percentages and variation	Knowledge: How to calculate compound interest and repeated interest changes How to calculate reverse percentages How to solve problems where two variables are in direct proportion How to solve problems where two variables are in inverse proportion How to work out problems about original values Understanding: Be able to explain what 'compound interest' means Apply to worded and multi-step questions Select the appropriate method to solve a percentages problem Select the appropriate method to solve a direct proportion problem Skills: Mental arithmetic – times tables facts Simplify fractions Multiply & divide without a calculator Substitute into expressions Solve simple algebraic equations	Students can: Explain the difference between simple and compound interest Answer a compound interest question using the minimum number of steps on a calculator Recognise when a question requires you to find an original amount and form the relevant equation Make links between proportion and linear graphs	Y8 Unit 10: Interpret fractions and percentages as operators; Work with percentages greater than 100%; Solve problems involving percentage change, including original value problems, and simple interest including in financial mathematics; Calculate exactly with fraction Y8 Unit 7: Understand and use compound units; Convert between compound units; Solve problems involving speed Solve problems involving rates of pay and unit pricing Y9 Unit 6: Percentages	• Collins Foundation textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Higher Unit 7				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Quadratic equations	Knowledge: Identify a quadratic graph Recognise factorisation of a quadratic Know the quadratic formula Define the discriminant Recognise a quadratic in completed square format Identify significant points of a quadratic graph Identify solutions of simultaneous equations graphically, where one is linear and one is non-linear Understanding: Draw a quadratic graph by generating a table of values Solve a quadratic by factorising, the quadratic formula and completing the square Apply the discriminant to identify the number of solutions to a quadratic Derive significant points of a quadratic graph Solve quadratic inequalities Skills: Problem solve using quadratic equations Use the method of intersection to solve one quadratic equation, using the graph of another quadratic equation and an appropriate straight line	Students can Draw quadratic graphs from their tables of values Solve quadratic equations of the form $x^2 + ax + b = 0$ Find the significant points of a quadratic graph Solve equations using the intersection of two graphs Solve a quadratic equation of the form $ax^2 + bx + c = 0$ by factorization Solve a quadratic equation using the quadratic formula or by completing the square Solve linear and non-linear simultaneous equations Solve multi-step problems involving quadratic equations Solve quadratic inequalities	Y7 Unit 7: Collecting like terms; expanding single brackets Y8 Unit 5: Collecting like terms involving indices Y8 Unit 13: Plot linear graphs Y9 Unit 4: Quadratic factorisation Y9 Unit 13: Drawing linear graphs from points; find the equation of a line from its graph Y10 Higher Unit 5: Substitution method for simultaneous equations; linear inequalities; graphical inequalities	• Collins Higher textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Foundation Unit 8				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Statistics: Representation and interpretation	Knowledge: Know different types of data – discrete, continuous, primary, and secondary. Know what a sample is and different types – random and stratified. Know the rules for drawing pie charts and scatter diagrams. Understanding: Understand the purpose of taking a sample for a population. Understand the advantages and disadvantages of primary and secondary data. Select the appropriate type of chart/graph to draw for given information. Skills: To draw and interpret pie charts. To draw and interpret scatter diagrams including drawing a line of best fit. To find and calculate averages from a grouped frequency table – discrete (lower ability) and continuous (higher ability)	Students can: Explain how to take an unbiased sample and work backwards from a sample to create an estimate for the total number of different groups in a population Select the appropriate chart/graph to draw for given information and construct this accurately Construct and interpret lines of best fit Calculate averages for both discrete and continuous information displayed in a frequency table	Y7 Unit 17: Drawing frequency tables, bar charts and pie charts. Y7 Unit 18: Calculate averages for discrete set of data and using a grouped frequency table for discrete data. Y8 Unit 15: Construct frequency table for discrete data and calculate averages from it. Construct histograms with equal class intervals. Y9 Unit 3: Displaying data and interpreting data.	• Collins Foundation textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

What are we learning?	What knowledge, understanding and skills will we gain?	What does mastery look like?	How does this build on prior learning?	What additional resources are available?
Sampling and more complex diagrams	Knowledge: Recognition of biased and unbiased sampling Draw a frequency polygon Draw a cumulative frequency graph Draw a box plot Draw a histogram with both equal and unequal class widths Understanding: Interpret a frequency polygon; work out its median, quartiles and interquartile range Interpret a box plot Interpret a histogram; calculate its mean, median, quartiles and interquartile range Skills: Identify appropriate methods of sampling, including application of stratified sampling Make comparisons between two samples by comparing their box plots	Students can: Know how to collect data to obtain and unbiased sample Draw and interpret frequency polygons Draw and interpret cumulative frequency diagrams Work out the median, the quartiles and the interquartile ranges from cumulative frequency diagrams Draw and interpret box plots Use stratified sampling Draw and interpret histograms where the class intervals are of equal and unequal widths, including when the c.f. axis is incomplete Calculate the mean, the median, the quartiles and the interquartile range from a histogram	Y7 Unit 17: Drawing frequency tables, bar charts and pie charts. Y7 Unit 18: Calculate averages for discrete set of data and using a grouped frequency table for discrete data. Y8 Unit 15: Construct frequency table for discrete data and calculate averages from it. Construct histograms with equal class intervals. Y9 Unit 3: Displaying data and interpreting data; calculating averages from frequency tables and grouped data	• Collins Higher textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Foundation Unit 9				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Constructions and Loci	Knowledge: How to construct a triangle from given data How to bisect a line and an angle How to define a locus How to solve locus problems Understanding: Apply knowledge to everyday examples Understand how a locus is formed by visualising it Combine one or more of the constructions to solve a problem Skills: Use a compass, protractor and a ruler correctly and accurately Follow precise and accurate instructions Visualise a spatial problem	Students can: Construct any given angle, such as 30, 60, 90 by combining constructions Explain the steps required to construct bisectors, perpendiculars or angles Answer exam-style questions where more than one construction is required Visualise and solve complex loci problems by careful and accurate construction	Y7 Unit 5: Visualising and constructing Y9 Unit 10: Angles and constructions	• Collins Foundation textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Higher Unit 9				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Combined events	Knowledge: How to draw a sample space diagram How to draw a tree diagram when probabilities or frequencies are given Understanding: Derive probabilities from theoretical or experimental data Identify conditional probability: when the probability of an event is dependent on the outcome of another event Use a tree diagram to calculate combined probabilities ('along the branches') Skills: Apply conditional probability to problem solving Identify the 'branches' to combine to calculate the solution to a problem	Students can Draw a tree diagram to work out the probability of combined events Use *and/or* to work out probabilities of specific outcomes of combined events Work out probabilities for independent events Work out the probability of combined events when the probability of each event changes depending on the outcome of the previous event (conditional probability) Draw and use frequency tree diagrams to solve problems, even when this method is not specified within the question.	Y8 Unit 14: Listing outcomes Y9 Unit 2: Calculating with fractions Y9 Unit 8: Probability Y10 Higher Unit 3: Mutually exclusive and exhaustive outcomes; probability and two-way tables	• Collins Higher textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Foundation Unit 10				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Curved surface area solids and pyramids	Knowledge: How to calculate the length of an arc How to calculate the area of a sector How to calculate the volume and surface area of a pyramid How to calculate the volume and surface area of a cone and a sphere Understanding: Determine quickly whether a shape is a prism Understand the difference between area and volume Understand the difference between volume and surface area Select the appropriate formula to utilise within a given question. Skills: Apply formulae for area of rectangle, triangle, circle Apply formula for circumference of circle Apply formula for volume of a prism	Students can: Instantly recall formulae for area and circumference of a circle, link this to the area and perimeter of a sector formulae Be comfortable using and applying the formulae for cones and spheres, including the use of pi Work backwards to find radius or angle when given the area of a sector or the length of an arc Work backwards to find height or radius when given the volume or surface area of a cone or sphere Work backwards to find the missing dimension of a pyramid when given the volume or surface area	Y7 Unit 15: Calculating space – perimeter and area. Y8 Unit 12: Calculating space – area and circumference formulae for circles. Y10 Fdn Unit 11: Working out the perimeter of shapes; Formula for the area of a rectangle, triangle, parallelogram, and trapezium; Properties of quadrilaterals and triangles; Circle terminology; Formula for the area and circumference of a circle.	• Collins Higher textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Higher Unit 10				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Properties of circles	Knowledge: Identify parts of a circle: radius, diameter, tangent, chord, sector, segment, circumference, arc, centre and semi-circle Know the nine circle theorems Understanding: Apply circle theorems to work out angles in circles and cyclic quadrilaterals Skills: Prove circle theorems Apply circle theorems to problem solving	Students can Use tangents and chords to work out angles in circles Calculate angles in cyclical quadrilaterals Use the alternate segment theorem to calculate angles in circles Prove circle theorems and use them to prove geometrical results Use the fewest steps possible to calculate a missing angle linked to circle theorems Combined knowledge of circle theorems with Pythagoras and Trigonometry to solve any problem relating to circles and triangles	Y9 Unit 9: Angles and constructions Y9 Unit 12: Parts of a circle; area and circumference of a circle Y10 Higher Unit 2: Similarity	• Collins Higher textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

Mathematics - Year 10 Foundation Unit 11				
What are we learning?	**What knowledge, understanding and skills will we gain?**	**What does mastery look like?**	**How does this build on prior learning?**	**What additional resources are available?**
Right- angled triangles	Knowledge: The names of different sides on a right-angled triangle when relating to Pythagoras and Trigonometry Pythagoras' theorem in right-angled triangles Trigonometric ratios in right-angled triangles Understanding: Rearranging Pythagoras' theorem to find either a short or long missing side Use Pythagoras' theorem to solve worded problems and problems relating to everyday life Selecting the correct trigonometric ratio to solve a missing angle or side problem. Use trigonometry to solve worded problems and problems relating to everyday life Skills: Recognise or determine if a triangle is right-angled Use and apply squares and square roots Operate a calculator efficiently	Students can: Consistently apply Pythagoras' theorem to any right-angled triangle to find either a shorter side or the hypotenuse Recognise 'Pythagoras in disguise' questions such as finding the length between two points on a co-ordinate grid, or the diagonal of a rectangle Use minimum number of steps on a calculator to solve a triangle Begin to apply the theorem to problems in 3D by using a two-step approach (solving one triangle then another) Recall SOHCAHTOA instantly and choose the correct ratio	Y7 Unit 1: Define and find square roots (including using the √ symbol) Y7 Unit 14: Solve two-step equations (including the use of brackets) when the solution is a whole number Y10 Fdn Unit 5: Solve linear equations	• Collins Foundation textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum

What are we learning?	What knowledge, understanding and skills will we gain?	What does mastery look like?	How does this build on prior learning?	What additional resources are available?
Variation	Knowledge: Recognise and interpret when two variables have a directly proportional relationship Recognise graphs that illustrate direct and inverse proportion Understanding: Set up a proportional relationship expression and an equation involving the constant of proportionality Calculate the constant of proportionality Skills: Problem solve when two variables are connected by a relationship in which they vary in direct or indirect proportion	Students can Recognise direct and indirect proportion Know what a constant of proportionality is, and how to find it Find formulae describing inverse or direct proportion Solve problems involving inverse or direct proportion including where they may need to combine two direct/indirect relationships between variables.	Y7 Unit 1: Recognise and use square and cube numbers Y7 Unit 7: Algebraic substitution Y7 Unit 14: Solving linear equations Y8 Unit 5: Algebraic substitution Y8 Unit 11: Solving linear equations Y9 Unit 5: Direct proportion Y9 Unit 13: Equations of lines	• Collins Higher textbook • BBC bitesize • Mymaths.co.uk • Hegarty Maths lessons • Method Maths online papers • Maths Genie Examination Style questions with videos and worked solutions • Corbett Maths with videos and answers • Transum