Maths

Year 10

Autumn			
Algebra 6	A6a. Expanding and Factorising	• Expand single, double and triple brackets • Explore difference of two squares expressions • Factorise into single and double brackets	**Key Vocabulary** Coefficient A number that multiplies a variable or bracket. Expression A mathematical sentence made up of numbers, variables and operations. Factor An integer that divides into a number without leaving a remainder, or integers that multiply to make a specific number. Quadratic expression An expression with four terms (often simplified to three terms) in which the highest exponent is 2. Term (Algebra) A single number or variable, or the product of several numbers and variables. Factorise To put an expression into brackets by dividing by the highest common factor (the opposite of expanding).
	A6b. Rearranging and Solving	• Form and solve linear equations across a variety of mathematical contexts • Change the subject of formulae • Solve quadratic equations using factorising and the quadratic formula	**Key Vocabulary** Formula A mathematical relationship given in symbols that represent something specific. E.g. b x h = area of rectangle. Inverse A mathematical opposite. Rearrange To change the way an equation is displayed using inverses. Solve To find a numerical value that satisfies a mathematical relationship (makes it true). Subject The isolated variable.
	A6c. Gradients and Lines	• Draw straight line graphs from a range of given information • Find the equation of a line from a range of given information • Use graphs to solve equations • Explore coordinate geometry to find lengths, midpoints and gradients of line segments • Explore gradients of parallel and perpendicular lines	**Key Vocabulary** Gradient The steepness of a line. Linear Has a constant additive difference. Perpendicular Two straight lines that intersect at a right angle (at 90º). Reciprocal A pair of numbers with a product of 1 - a multiplicative inverse. Y-intercept The point at which the line crosses the y-axis.
Geometry 5	G5. Angles and Bearings	• Work with three figure bearings including constructing diagrams • Solve bearings problems involving scale diagrams, angle rules and Pythagoras' Theorem	**Key Vocabulary** Angle The figure formed by two straight lines meeting (measured in degrees). A measure of turn. Bearing An angle measured clockwise from the North line, expressed using 3 digits. Parallel Two straight lines that never intersect and are always the same distance apart (the same gradient). Perpendicular Two straight lines that intersect at a right angle (at 90º). Cardinal Directions The four main compass points: North, East, South, West.

Probability & Statistics 5	P5a. Collecting, Representing and Interpreting Data 1	• Explore sampling and populations • Construct and interpret frequency diagrams • Work with averages from tables and lists • Solve problems with two-way tables, pie charts and stem and leaf diagrams	**Key Vocabulary** Outlier A value that stands apart from the data set. Primary Data Data that you collect yourself. Qualitative Descriptive data: colours, genders, names, emotions etc. Quantitative Numerical data. Secondary Data Data sourced from elsewhere e.g. the internet/ newspapers/ local statistics. Population A whole group being studied. Sample A collection from a larger group.
Spring			
Number 10	N10a. Indices and Roots	• Calculate roots and indices of higher order (than 2 or 3) • Explore surds • Calculate and convert standard form • Work with index laws	**Key Vocabulary** Exponent The number of repeats in the multiplication (synonym of index/indices). Irrational A number that cannot be made by dividing two integers Power A base with an exponent/index. Sometimes used as a synonym for exponent/index. Square root A number that when multiplied by itself gives the value (symbol √). Surd An irrational root.
Number 10	N10b. Types of Number and Sequence	• Recap sequence types • Solve problems involving a variety of sequences (including sequences with surds) • Solve problems involving the highest common factor and lowest common multiple	**Key Vocabulary** Geometric A type of sequence in which each term is found by multiplying the previous term by a fixed non-zero number. Linear sequence A sequence with a constant difference (amount added or subtracted each time). Product The result of a multiplication.
Probability & Statistics 5	P5b. Collecting, Representing and Interpreting Data 2	• Construct and interpret dual and composite bar charts and time series graphs • Criticise graphs and charts and recognise misleading representations • Construct and interpret scatter graphs, including extrapolating and interpolating using a line of best fit	**Key Vocabulary** Correlation The type of relationship between two variables. Linear Has a constant additive difference. Outlier A value that stands apart from the data set. Extrapolate Using a line of best fit to estimate outside the range of data. Interpolate Using a line of best fit to estimate within the range of data.
Ratio & Proportion 3	R3. Ratio & Fractions	• Solve numerical and algebraic ratio problems • Solve ratio problems in the context of currencies, linear graphs and direct proportion	**Key Vocabulary** Currency A system of money used in a particular country. Direct proportion As one variable is multiplied by a scale factor the other variable is multiplied by the same scale factor. Linear Has a constant additive difference.
Summer			

Probability & Statistics 6	**P6. Probability 4**	• Use experimental data to estimate probabilities • Find probabilities from tables, Venn diagrams and frequency trees • Use tree diagrams to find probabilities *Students on the higher GCSE pathway will also:* • *Construct and interpret diagrams to calculate with conditional probabilities*	**Key Vocabulary** Independent event An event that is not affected by any other events. Relative Frequency How often something happens divided by the total number of outcomes. Dependent event An event that is affected by the outcome of another event. Theoretical Probability The likelihood of an event occurring based on logical reasoning and mathematical principles. Conditional Probability The likelihood of an event occurring given that another event has already occurred.
Ratio & Proportion 4	**R4. Percentages and Interest**	• Calculate repeated percentage change, including simple and compound interest and growth and decay • Solve problems involving percentages, ratios and fractions *Students on the higher GCSE pathway will also:* • *Explore iterative processes and notation*	**Key Vocabulary** Depreciate To decrease in value. Depreciation The reduction in value of an item. Growth The process of increasing/growing. Interest The cost of borrowed money or money paid for saving. Profit Money made after expenditure and taxes. Decay The process of decreasing.
Algebra 7	**A7. Using Graphs**	• Construct and interpret real-life graphs including distance-time and speed-time • Interpret and recognise graphs that illustrate direct and inverse proportion • Find approximate solutions to equations using graphs *Students on the higher GCSE pathway will also:* • *Estimate the area under a curve and the gradient at a point*	**Key Vocabulary** Gradient The steepness of a line. Trapezium A quadrilateral with one pair of parallel sides Acceleration The rate at which an object's velocity changes over time. Velocity The speed of an object in a given direction. Estimate Roughly judge or calculate the value of.
Geometry 6	**G6. Congruence, Similarity & Enlargement**	• Understand the difference between similarity and congruence • Apply geometric knowledge to find missing lengths in similar shapes • Explore and use the congruency conditions for triangles *Students on the higher GCSE pathway will also:* • Explore areas and volumes of similar shapes • Prove that a pair of triangles are congruent	**Key Vocabulary** Congruent The same shape and size Proof A logical, sequential mathematical argument used to show that a statement is true. Scale Factor A multiplier describing a change in size (SF more than 1 = increased size, SF less than 1 = decreased size). Similar Shapes Shapes of different sizes that have corresponding sides in equal proportion and identical corresponding angles.

Geometry 7	**G7. Trigonometry**	• Identify and label the hypotenuse, adjacent and opposite in a right-angled triangle • Work with sine, cosine and tangent to find missing sides and angles • Solve problems involving trigonometry and Pythagoras' theorem • Explore exact values of trigonometric ratios *Students on the higher GCSE pathway will also:* • *Work with the sine and cosine rule* • *Find the area of triangles using trigonometry* • *Work with Pythagoras' theorem and trigonometry in 3D shapes*	**Key Vocabulary** Adjacent The side next to the angle of interest. Hypotenuse The longest side on a right-angled triangle. It is always opposite the right angle. Sine The ratio of the opposite and hypotenuse in a right-angled triangle. Cosine The ratio of the adjacent and hypotenuse in a right-angled triangle. Tangent The ratio of the opposite ad adjacent in a right-angled triangle.
Algebra 8	**A8a. Representing Solutions of Equations & Inequalities**	• Build a deeper understanding of the meaning of a solution • Show solutions inequalities on number lines • Interpret inequalities from number lines *Students on the higher GCSE pathway will also:* • *Represent solutions to inequalities using regions on a graph* • *Solve quadratic equations and inequalities in one variable*	**Key Vocabulary** Expression A mathematical sentence made up of numbers, variables and operations. Inequality A mathematical relationship that compares two expressions showing if one is greater than, less than or equal to another. Solution The set or value that satisfies the mathematical relationship (makes it true). Variable A letter than represents an unknown number or a changeable quantity.
	A8b. Simultaneous Equations	• Explore linear simultaneous equations and learn a variety of methods for solving them; elimination, substitution and graphical • Form and solve simultaneous equations for a given context *Students on the higher GCSE pathway will also:* • *Solve pairs of simultaneous equations in which on is quadratic* • *Solve a pair of simultaneous equations involving a third unknown*	**Key Vocabulary** Coefficient A number that multiplies a variable or bracket. Rearrange To change the way an equation is displayed using inverses. Simultaneous equations Groups of equations related to common variables. Solve To find a numerical value that satisfies a mathematical relationship (makes it true). Substitute/Substitution Replace a variable with a numerical value. Eliminate To remove or get rid of something.