GCSE (9-1) 5 year Scheme of Work

Higher Year 3 Scheme of Work

Key: Italic specification references are assumed prior knowledge and are covered in the prior knowledge check rather than the main teaching.

Term	Unit/section title	Prior knowledge	Unit objectives
	1 Number *(Edexcel Scheme of Work Unit 1: Powers, decimals, HCF and LCM, positive and negative, roots, rounding, reciprocals, standard form, indices and surds)*	**Students should have a firm grasp of place value and be able to order integers and decimals and use the four operations.** **Students should have knowledge of integer complements to 10 and to 100, multiplication facts to 10 × 10, strategies for multiplying and dividing by 10, 100 and 1000.** **Students will have encountered squares, square roots, cubes and cube roots and have knowledge of classifying integers.**	
	1.1 Number problems and reasoning	● Multiply numbers in a similar format to questions later in the section. ● List possible outcomes from two events.	● Work out the total number of ways of performing a series of tasks.
	1.2 Place value and estimating	● Estimate the value of a square root. ● Round numbers to a specified degree of accuracy. ● Apply the four operations.	● Estimate an answer. ● Use place value to answer questions.
	1.3 HCF and LCM	● Multiply prime factors together. ● List the factors of a number.	● Write a number of the product of its prime factors. ● Find the HCF and LCM of two numbers.
	1.4 Calculating with powers (indices)	● Work out simple powers. ● Apply the four operations.	● Use powers and roots in calculations. ● Multiply and divide using index laws. ● Work out a power raised to a power.
	1.5 Zero, negative and fractional indices	● Convert between fractions and decimals. ● Use the laws of indices for positive indices.	● Use negative indices. ● Use fractional indices.

	1.6 Powers of 10 and standard form	● Multiply by powers of 10 when the number is written as an ordinary number and not an index. ● Review different ways to divide by 10. ● Use negative indices.	● Write a number in standard form. ● Calculate with numbers in standard form.
	1.7 Surds	● Review the meaning of the dot in the recurring notation. ● Identify the missing multiple which practices the skills of searching for a perfect square factor.	● Understand the difference between rational and irrational numbers. ● Simplify a surd. ● Rationalise a denominator.
A u t u m n t e r m	**2 Algebra** *(Edexcel Scheme of Work Unit 2: Expressions, substituting into simple formulae, expanding and factorising, equations, sequences and inequalities, simple proof)*	**Students should have prior knowledge of some of these topics, as they are encountered at Key Stage 3:** **• the ability to use negative numbers with the four operations and recall and use hierarchy of operations and understand inverse operations;** **• dealing with decimals and negatives on a calculator;** **• using index laws numerically.** **Students should be able to use and interpret algebraic notation.** **Students should be able to set up and solve simple equations.** **Students should recall the definitions of geometric and arithmetic sequences.**	
	2.1 Algebraic indices	● Recognise that squaring and taking the square roots, and cubing and taking the cube root, are inverse operations. ●Calculate with powers.	● Use the rules of indices to simplify algebraic expressions.

	2.2 Expanding and factorising	● Simplify algebraic terms, including using index notation. ● Multiply a single term over a bracket. ● Find highest common factors.	● Expand brackets. ● Factorise algebraic expressions.
	2.3 Equations	● Solve a simple equation expressed in words. ● Solve simple algrebraic equations ● Find lowest common multiples.	● Solve equations involving brackets and numerical fractions. ● Use equations to solve problems.
	2.4 Formulae	● Substitute values into a one-step formula. ● Write numbers in standard form.	● Substitute numbers into formulae. ● Rearrange formulae. ● Distinguish between expressions, equations, formulae and identities.
	2.5 Linear sequences	● Find the next term of a given arithmetic sequence. ● Substitute values in a simple linear expression. ● Write terms in a sequence given the nth term. ● Use a function machine to find outputs.	● Find a general formula for the nth term of an arithmetic sequence. ● Determine whether a particular number is a term of a given arithmetic sequence.
	2.6 Non-linear sequences	● Find the next term of given sequences. ● Identify arithmetic and geometric sequences. ● Find the term-to-term rule for a sequence.	● Solve problems using geometric sequences. ● Work out terms in Fibonnaci-like sequences. ● Find the nth term of a quadratic sequence.
	2.7 More expanding and factorising	● Recalling a square root. ● Finding the factor pairs of small integers.	● Expand the product of two brackets. ● Use the difference of two squares. ● Factorise quadratics of the form $x^2 + bx + c$.
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	3 Interpreting and representing data *(Edexcel Scheme of Work Unit 3: Averages and range, collecting data, representing data)*	**Students should be able to read scales on graphs, draw circles, measure angles and plot coordinates in the first quadrant.** **Students should have experience of tally charts.** **Students will have used inequality notation.** **Students must be able to find midpoint of two numbers.** **Students should be able to find the range, mean, median and mode of a data set.**	
	3.1 Statistical diagrams 1	● Work out mode, median and range from a list of numbers.	● Construct and use back-to-back stem and leaf diagrams. ● Construct and use frequency polygons and pie charts.
	3.2 Time series	● Identify trends by noticing whether sequences of numbers increase, decrease or oscillate.	● Plot and interpret time series graphs. ● Use trends to predict what might happen in the future.
	3.3 Scatter graphs	● Recognise when a line has a positive, negative or zero gradient. ● Plot points on a coordinate grid, and identify points that do not lie on a straight line.	● Plot and interpret scatter graphs. ● Determine whether or not there is a linear relationship between two variables.

	3.4 Line of best fit	● Understand and be able to define the meaning of correlation. ● Read values from graphs.	● Draw a line of best fit on a scatter graph. ● Use the line of best fit to predict values.
	3.5 Averages and range	● Find the range of a list of numbers. ● Find the midpoint of two numbers.	● Decide which average is best for a set of data. ● Estimate the mean and range from a grouped frequency table. ● Find the modal class and the group containing the median.
	3.6 Statistical diagrams 2	● Use subtraction to find missing values. ● Draw a bar chart. ● Draw a pie chart.	● Construct and use two-way tables. ● Choose appropriate diagrams to display data. ● Recognise misleading graphs.
	4 Fractions, ratio and percentages *(Edexcel Scheme of Work Unit 4: Fractions, percentages, ratio and proportion)*	**Students should know the four operations of number. Students should be able to find common factors. Students should have a basic understanding of fractions as being 'parts of a whole'. Students can define percentage as 'number of parts per hundred'. Students are aware that percentages are used in everyday life. Students should be able use ratio notation, and to write a ratio in its simplest form**	
	4.1 Fractions	● Identify unit fractions, improper fractions and mixed numbers. ● Multiply a whole number by a fraction. ● Know the priority of operations.	● Add, subtract, multiply and divide fractions and mixed numbers. ● Find the reciprocal of an integer, decimal or fraction.
Spring term	**4.2 Ratios**	● Multiply a fraction by its reciprocal for a product of 1. ● Simplify ratios. ● Write ratios in the form $n : 1$.	● Write ratios in the form $1 : n$ or $n : 1$. ● Compare ratios. ● Find quantities using ratios. ● Solve problems involving ratios.
	4.3 Ratio and proportion	● Write one number as a proportion of the total. ● Identify equivalent ratios.	● Convert between currencies and measures. ● Recognise and use direct proportion. ● Solve problems involving ratios and proportion.

4.4 Percentages	● Find a percentage of a given amount. ● Work out percentage multipliers.	● Work out percentage increases and decreases. ● Solve real-life problems involving percentages.
4.5 Fractions, decimals and percentages	● Convert between fractions, decimals and percentages. ● Solve simple equations.	● Calculate using fractions, decimals and percentages. ● Convert a recurring decimal to a fraction.
5 Angles and trigonometry *(Edexcel Scheme of Work Unit 5: Angles, polygons, parallel lines; Right-angled triangles: Pythagoras and trigonometry)*	**Students should be able to rearrange simple formulae and equations, as preparation for rearranging trig formulae.** **Students should recall basic angle facts.** **Students should understand that fractions are more accurate in calculations than rounded percentage or decimal equivalents.** **Students should recall the properties of special types of triangles and quadrilaterals.**	
5.1 Angle properties of triangles and quadrilaterals	● Recognise special types of triangle and quadrilateral. ● Recall basic angle facts.	● Derive and use the sum of angles in a triangle and in a quadrilateral. ● Derive and use the fact that the exterior angle of a triangle is equal to the sum of the two opposite interior angles.
5.2 Interior angles of a polygon	● Name polygons and understand the meaning of 'regular polygon'. ● Substitute numbers into an expression. ● Find missing angles in triangles, quadrilaterals and at a point.	● Calculate the sum of the interior angles of a polygon. ● Use the interior angles of polygons to solve problems.
5.3 Exterior angles of a polygon	● Find missing angles on a straight line. ● Calculate the sum of interior angles of a polygon.	● Know the sum of the exterior angles of a polygon. ● Use the angles of polygons to solve problems.
5.4 Pythagoras' theorem 1	● Recall square numbers and square roots. ● Find the area of a square.	● Calculate the length of the hypotenuse in a right-angled triangle. ● Solve problems using Pythagoras' theorem.

	5.5 Pythagoras' theorem 2	● Find square roots. ● Recognise perfect squares. ● Use Pythagoras' theorem to find the length of the hypotenuse.	● Calculate the length of a shorter side in a right-angled triangle. ● Solve problems using Pythagoras' theorem.
	5.6 Trigonometry 1	● Convert fractions to decimals. ● Identify the hypotenuse. ● Use the angle sum of a triangle to work out missing angles.	● Use trigonometric ratios to find lengths in a right-angled triangle. ● Use trigonometric ratios to solve problems.
	5.7 Trigonometry 2	● Identify the opposite and adjacent sides of a given angle in right-angled triangles. ● Use the trigonometric ratios to find lengths in right-angled triangles.	● Use trigonometric ratios to calculate an angle in a right-angled triangle. ● Find angles of elevation and angles of depression. ● Use trigonometric ratios to solve problems. ● Know the exact values of the sine, cosine and tangent of some angles.
	End of term test		
	6 Graphs *(Edexcel Scheme of Work Unit 6: Real-life and algebraic linear graphs, quadratic and cubic graphs, the equation of a circle, plus rates of change and area under graphs made from straight lines)*	**Students should be able to identify coordinates of given points in the first quadrant or all four quadrants.** **Students should be able to write the equation for a straight line graph.** **Students should be able to use and draw conversion graphs.** **Students should be able to use function machines and inverse operations.** **Students should be able to use compound units, such a speed.**	
	6.1 Linear graphs	● Identify positive and negative gradients and intercepts from graphs. ● Rearrange equations.	● Find the gradient and y-intercept from a linear equation. ● Rearrange an equation into the form $y = mx + c$. ● Compare two graphs from their equations. ● Plot graphs with equations $ax + by = c$.
	6.2 More linear graphs	● Identify lines with the same gradient or y-intercept from their equations. ● Write the equation of a line from a graph.	● Sketch graphs using the gradient and intercepts. ● Find the equation of a line, given its gradient and one point on the line. ● Find the gradient of a line through two points.
	6.3 Graphing rates of change	● Find speed from given distance and time. ● Find the area of triangles and rectangles.	● Draw and interpret distance–time graphs. ● Calculate average speed from a distance–time graph. ● Understand velocity–time graphs. ● Find acceleration and distance from velocity–time graphs.

	6.4 Real-life graphs	● Write the equation of a line from a sketch graph. ● Plot a graph using values given in a table.	● Draw and interpret real-life linear graphs. ● Recognise direct proportion. ● Draw and use a line of best fit.
	6.5 Line segments	● Identify parallel and perpendicular lines ● Know properties of gradients of parallel lines. ● Identify the gradient and intercept from an equation in the form y = mx + c.	● Find the coordinates of the midpoint of a line segment. ● Find the gradient and length of a line segment. ● Find the equations of lines parallel or perpendicular to a given line.
	6.6 Quadratic graphs	● Identify quadratic expressions. ● Write the equation of a line from a graph.	● Draw quadratic graphs. ● Solve quadratic equations using graphs. ● Identify the line of symmetry of a quadratic graph. ● Interpret quadratic graphs relating to real-life situations.
	6.7 Cubic and reciprocal graphs	● Know the shape of linear and quadratic graphs.	● Draw graphs of cubic functions. ● Solve cubic equations using graphs. ● Draw graphs of reciprocal functions. ● Recognise a graph from its shape.
	6.8 More graphs	● Match the shape of a container to the graph of depth of water against time. ● Read values from graphs.	● Interpret linear and non-linear real-life graphs. ● Draw the graph of a circle.
S u m m e r t e r m	**7 Area and volume** *(Edexcel Scheme of Work Unit 7: Perimeter, area and volume, plane shapes and prisms, circles, cylinders, spheres, cones; Accuracy and bounds)*	**Students should know the names and properties of 3D shapes.** **The concept of perimeter and area by measuring lengths of sides will be familiar to students.** **Students should be able to substitute numbers into an equation and give answers to an appropriate degree of accuracy.** **Students should know the various metric units.** **Students should be able to identify planes of symmetry of 3D solids.** **Students should be able to sketch a net of a 3D shape.** **Students should be able to work out the volume of a 3D solid made of cuboids.** **Students should recall Pythagoras' theorem.**	
	7.1 Perimeter and area	● Recognising units of length (perimeter) and area. ● Work out the area and perimeter of rectangles, triangles and parallelograms.	● Find the perimeter and area of compound shapes. ● Recall and use the formula for the area of a trapezium.
	7.2 Units and accuracy	● Recall the formulae for the area of quadrilaterals and triangles. Identify the possible integer values of x from an inequality. ● Round numbers to a specified degree of accuracy. ● Work out percentages of quantities.	● Convert between metric units of area. ● Calculate the maximum and minimum possible values of a measurement.

7.3 Prisms	● Calculate the volume and surface area of a cuboid. ● Calculate the volume of a shape made from cuboids.	● Convert between metric units of volume. ● Calculate volumes and surface areas of prisms.	
7.4 Circles	● Understand 'radius' and 'diameter'. ● Solve and rearrange simple equations.	● Calculate the area and circumference of a circle. ● Calculate area and circumference in terms of π.	
7.5 Sectors of circles	● Work out fractions of a circle given the angle of a sector. ● Simplify equations.	● Calculate the perimeter and area of semicircles and quarter circles. ● Calculate arc lengths, angles and areas of sectors of circles.	
7.6 Cylinders and spheres	● Find the area and circumference of a circle in terms of π. ● Sketch a net of a cylinder. ● Solve simple equations.	● Calculate volume and surface area of a cylinder and a sphere. ● Solve problems involving volumes and surface areas.	
7.7 Pyramids and cones	● Find the volume of a cube. ● Find the side length of a cube given its volume. ● Calculate the area of a triangle. ● Use Pythagoras' theorem to work out the length of the hypotenuse.	● Calculate volume and surface area of pyramids and cones. ● Solve problems involving pyramids and cones.	
8 Transformations and constructions *(Edexcel Scheme of Work Unit 8: Transformations; Constructions: triangles, nets, plan and elevation, loci, scale drawings and bearings)*	**Students should be able to recognise 2D shapes.** **Students should be able to plot coordinates in four quadrants and linear equations parallel to the coordinate axes.** **Students should be able to convert metric measures.** **Students should be able to recognise congruent and similar shapes.** **Students should be able to transform shapes using translation, reflection, rotation and enlargement.**		
8.1 3D solids	● Draw 3D shapes on an isometric grid. ● Recognise dimensions of a cuboid.	● Draw plans and elevations of 3D solids.	
8.2 Reflection and rotation	● Draw simple straight lines on a coordinate grid. ● Know whether the image is congruent to the original following a reflection or a rotation.	● Reflect a 2D shape in a mirror line. ● Rotate a 2D shape about a centre of rotation. ● Describe reflections and rotations.	
8.3 Enlargement	● Enlarge shapes on a coordinate grid in one quadrant.	●Enlarge shapes by fractional and negative scale factors about a centre of enlargement.	
8.4 Transformations and combinations of transformations	● Describe translations	● Translate a shape using a vector. ● Carry out and describe combinations of transformations.	
8.5 Bearings and scale drawings	● Convert metric measures and apply to scales. ● Accurate drawing of right-angled triangle.	● Draw and use scales on maps and scale drawings. ● Solve problems involving bearings.	
8.6 Constructions 1	● Accurate drawings of triangles given SSS and ASA. ● Know the meaning of the terms perpendicular, bisect, arc.	● Construct triangles using a ruler and compasses. ● Construct the perpendicular bisector of a line. ● Construct the shortest distance from a point to a line using a ruler and compasses.	
8.7 Constructions 2	● Draw angles with a protractor. ● Construct triangles and deduce infomration from them.	● Bisect an angle using a ruler and compasses. ● Construct angles using a ruler and compasses. ● Construct shapes made from triangles using a ruler and compasses.	
8.8 Loci		● Draw a locus. ● Use loci to solve problems.	
End of year test			

		Higher Year 4 Scheme of Work	
Term	**Unit/section title**	**Prior knowledge**	**Unit objectives**
A u t u m n t e r m	**9 Equations and inequalities** *(Edexcel Scheme of Work Unit 9: Algebra: Solving quadratic equations and inequalities, solving simultaneous equations algebraically)*	**Students should understand the ≥ and ≤ symbols.** **Students can substitute into, solve and rearrange linear equations.** **Students should be able to factorise simple quadratic expressions.** **Students should be able to recognise the equation of a circle.**	
	9.1 Solving quadratic equations 1	● Know that a square has two possible roots ● Find the factors of a given number. ● Factorise expressions. ● Solve simple equations containing a squared term.	● Find the roots of quadratic functions. ● Rearrange and solve simple quadratic equations.
	9.2 Solving quadratic equations 2	● Understand the term quadratic ● Find positive and negative square roots. ● Solve quadratic equations by factorising. ● Expand two pairs of brackets. ● Simplify surds.	● Solve more complex quadratic equations. ● Use the quadratic formula to solve a quadratic equation.
	9.3 Completing the square	● Expand and simplify a square bracket. ● Simplify surds. ● Solve simple equations, giving the answer in surd form.	● Complete the square for a quadratic expression. ● Solve quadratic equations by completing the square.
	9.4 Solving simple simultaneous equations	● Substitute into simple algebraic expressions. ● Rearrange equations.	● Solve simple simultaneous equations. ● Solve simultaneous equations for real-life situations.
	9.5 More simultaneous equations	● Recall the equation of a straight line. ● Solve simple simultaneous equations.	● Use simultaneous equations to find the equation of a straight line. ● Solve linear simultaneous equations where both equations are multiplied. ● Interpret real-life situations involving two unknowns and solve them.

9.6 Solving linear and quadratic simultaneous equations	● Identify different types of equations. ● Solve quadraric equations.	● Solve simultaneous equations with one quadratic equation. ● Use real-life situations to construct quadratic and linear equations and solve them.
9.7 Solving linear inequalities	● Understand inequality signs ● Construct correct inequalities from given information	● Solve inequalities and show the solution on a number line and using set notation.
10 Probability *(Edexcel Scheme of Work Unit 10: Probability)*	**Students should understand that a probability is a number between 0 and 1, and distinguish between events which are impossible, unlikely, even chance, likely, and certain to occur.** **Students should be able to mark events and/or probabilities on a probability scale of 0 to 1.** **Students should know how to add and multiply fractions and decimals.** **Students should have experience of expressing one number as a fraction of another number.** **Students should be able to list all outcomes for a single event systematically.** **Students should be able to make predictions from experimental data.** **Students should be able to complete a two-way table.**	
10.1 Combined events	● List all outcomes for a single event systematically. ● List all outcomes for two events systemaically.	● Use the product rule for finding the number of outcomes for two or more events. ● List all the possible outcomes of two events in a sample space diagram.
10.2 Mutually exclusive events	● Add decimals. Subtract decimals and fractions from 1. ● Understand the relationship between ratios and fractions.	● Identify mutually exclusive outcomes and events. ● Find the probabilities of mutually exclusive outcomes and events. ● Find the probability of an event not happening.
10.3 Experimental probability	● Simplify fractions. ● Multilply whole numbers by decimals.	● Work out the expected results for experimental and theoretical probabilities. ● Compare real results with theoretical expected values to see if a game is fair.
10.4 Independent events and tree diagrams	● Add and multiply fractions and decimals.	● Draw and use frequency trees. ● Calculate probabilities of repeated events. ● Draw and use probability tree diagrams.
10.5 Conditional probability	● Know that the probability of something not happening is 1 minus the probability of the event happening. ● Draw and use probability tree diagrams.	● Decide if two events are independent. ● Draw and use tree diagrams to calculate conditional probability. ● Draw and use tree diagrams without replacement. ● Use two-way tables to calculate conditional probability.
10.6 Venn diagrams and set notation	● Interpret inequalities. ● Use Venn diagrams.	● Use Venn diagrams to calculate conditional probability. ● Use set notation.

	11 Multiplicative reasoning *(Edexcel Scheme of Work Unit 11: Multiplicative reasoning: direct and inverse proportion, relating to graph form for direct, compound measures, repeated proportional change)*	**Students should be able to find a percentage of an amount and relate percentages to decimals.** **Students should be able to rearrange equations and use these to solve problems.** **Knowledge of speed = distance/time, density = mass/volume.** **Students should be able to convert between metric units.** **Students should be able to solve simple direct and indirect proportion problems, including currency conversion.**	
	11.1 Growth and decay	● Understand the use of indices. ● Work out the decimal multiplier for a percentage increase/decrease.	● Find an amount after repeated percentage changes. ● Solve growth and decay problems.
	11.2 Compound measures	● Calculate simple rates. ● Substitute numbers into equations, and solve for the unknown. ● Use speed = distance/time to solve problems.	● Calculate rates. ● Convert between metric speed measures. ● Use a formula to calculate speed and acceleration.
	11.3 More compound measures	● Convert between metric units. ● Recall the formulae for the area of a circle and volume of a prism.	● Solve problems involving compound measures.
	11.4 Ratio and proportion	● Rearrange formulae. ● Recognise graphs of y = x and y = 1/x. ● Find the gradient of a line given its equation. ● Decide whether quantities are in direct proportion.	● Use relationships involving ratio. ● Use direct and indirect proportion.
	End of term test		
Spring term	**12 Similarity and congruence** *(Edexcel Scheme of Work Unit 12: Similarity and congruence in 2D and 3D)*	**Students should be able to recognise and enlarge shapes and calculate scale factors.** **Students should have knowledge of how to calculate area and volume in various metric measures.** **Students should be able to measure lines and angles, and use compasses, ruler and protractor to construct standard constructions.** **Students should be able to recognise congruent shapes.** **Students should know basic angle facts.**	
	12.1 Congruence	● Know the angle sum of interior angles of a triangle. ● Recognisse congruent shapes. ● Recall basic angle facts. ● Find missing lengths using Pythagoras' theorem.	● Show that two triangles are congruent. ● Know the conditions of congruence.
	12.2 Geometric proof and congruence	● Know the conditions of congruence and use correct mathematical notation for equal angles and sides. ● Recall the properties of special triangles and quadrilaterals.	● Prove shapes are congruent. ● Solve problems involving congruence.

12.3 Similarity	• Use geometric properties to find similarities and differences between given polygons. • Calculate scale factors.	• Use the ratio of corresponding sides to work out scale factors. • Find missing lengths on similar shapes.
12.4 More similarity	• Find area scale factor, given length scale factor.	• Use similar triangles to work out lengths in real life. • Use the link between linear scale factor and area scale factor to solve problems.
12.5 Similarity in 3D solids	• Work out the volume and surface area of a cube. • Convert between metric units. • Work out cubes and cube roots.	• Use the link between scale factors for length, area and volume to solve problems.
13 More trigonometry *(Edexcel Scheme of Work Unit 13: Sine and cosine rules, (1/2)ab sin C, trigonometry and Pythagoras' Theorem in 3D, trigonometric graphs, and accuracy and bounds)*	**Students should be able to use axes and coordinates to specify points in all four quadrants.** **Students should be able to recall and apply Pythagoras' Theorem and trigonometric ratios.** **Students should be able to substitute into formulae.**	
13.1 Accuracy	• Find upper and lower bounds of a given measurement.	• Understand and use upper and lower bounds in calculations involving trigonometry.
13.2 Graph of the sine function	• Know the exact values of sin θ for θ = 30°, 45° , 60° and 90° • Use Pythagoras' theorem. • Find angles using the sin function.	• Understand how to find the sine of any angle. • Know the graph of the sine function and use it to solve equations.
13.3 Graph of the cosine function	• Know the exact values of cos θ for θ = 30°, 45° , 60° and 90° • Use Pythagoras' theorem. • Find angles using the cos function.	• Understand how to find the cosine of any angle. • Know the graph of the cosine function and use it to solve equations.
13.4 The tangent function	• Know the exact values of tan θ for θ = 30°, 45° , 60° • Use Pythagoras' theorem. • Find angles using the tan function.	• Understand how to find the tangent of any angle. • Know the graph of the tangent function and use it to solve equations.
13.5 Calculating areas and the sine rule	• Calculate the area of a triangle using (1/2)b × h • Know the formula for calculating the area of a circle. • Use trigonometry	• Find the area of a triangle and a segment of a circle. • Use the sine rule to solve 2D problems.
13.6 The cosine rule and 2D trigonometric problems	• Use bearings • Calculate the area of a triangle. • Solve calculations.	• Use the cosine rule to solve 2D problems. • Solve bearings problems using trigonometry.
13.7 Solving problems in 3D	• Use the sine and cosine rule.	• Use Pythagoras' theorem in 3D. • Use trigonometry in 3D.
13.8 Transforming trigonometric graphs 1	• Reflect and rotate a coordiante point. • Know the exact values of sin θ and cos θ for θ = 0°, 30°, 45° , 60° and 90°; know the exact value of tan θ for θ = 0°, 30°, 45° and 60° • Sketch y = sinx, y = cosx and y= tanx for x from 0° to 360°	• Recognise how changes in a function aff ect trigonometric graphs.

	13.9 Transforming trigonometric graphs 2	● Translate coordinate points by column vectors. ● Understand negative translations.	● Recognise how changes in a function aff ect trigonometric graphs.
	14 Further statistics *(Edexcel Scheme of Work Unit 14: Statistics and sampling, cumulative frequency and histograms)*	**Students should understand the different types of data: discrete/continuous.** **Students should have experience of inequality notation.** **Students should be able to multiply a fraction by a number.** **Students should understand the data handling cycle.**	
	14.1 Sampling	● Use fractions and percentages to work out data from a table.	●Understand how to take a simple random sample. ● Understand how to take a stratifi ed sample.
	14.2 Cumulative frequency	● Find the median of a data set.	● Draw and interpret cumulative frequency tables and diagrams. ● Work out the median, quartiles and interquartile range from a cumulative frequency diagram.
	14.3 Box plots	● Find the median and range from a stem-and-leaf diagram.	● Find the quartiles and the interquartile range from stem-and-leaf diagrams. ● Draw and interpret box plots.
	14.4 Drawing histograms	● Division calculations ● Draw a frequency diagram. ● Write the modal class ● Estimate the mean mass.	● Understand frequency density. ● Draw histograms.
	14.5 Interpreting histograms	● Write the modal class ● Estimate the mean mass.	● Interpret histograms.
	14.6 Comparing and describing populations	● Work out the mean, median and mode of data sets. ● Work out the mean and range from a table.	●Compare two sets of data.
	End of term test		
S u m m e r t e r m	**15 Equations and graphs** *(Edexcel Scheme of Work Unit 15: Quadratics, expanding more than two brackets, sketching graphs, graphs of circles, cubes and quadratics)*	**Students should be able to solve quadratics and linear equations.** **Students should be able to solve simultaneous equations algebraically.**	
	15.1 Solving simultaneous equations graphically	● Know and draw graphs of circles.	● Solve simultaneous equations graphically.
	15.2 Representing inequalities graphically	● Know which integers satisfy an inequality ● Solve inequalitites with one variable and show solution using set notation.	● Represent inequalities on graphs. ● Interpret graphs of inequalities.
	15.3 Graphs of quadratic functions	● Solve quadratic equations by factorising. ● Sketch simple quadratic graphs ● Find coordinates of maximum point.	● Recognise and draw quadratic functions.
	15.4 Solving quadratic equations graphically	● Understand manimum and minimum points. ● Find roots of an equation by completing the square and using the quadratic formula.	● Find approximate solutions to quadratic equations graphically. ● Solve quadratic equations using an iterative process.
	15.5 Graphs of cubic functions	● Know where a graph will cross the x-axis ● Expand and simplify double brackets ● Find roots of a quadratic equation by completing the square	● Find the roots of cubic equations. ● Sketch graphs of cubic functions. ● Solve cubic equations using an iterative process.

16 Circle theorems *(Edexcel Scheme of Work Unit 16: Circle theorems and circle geometry)*	**Students should have practical experience of drawing circles with compasses.** **Students should recall the words, centre, radius, diameter, circumference, arc, sector and segment** **Students should recall the relationship of the gradient between two perpendicular lines.** **Students should be able to find the equation of the straight line, given a gradient and a coordinate.**	
16.1 Radii and chords	● Recall the properties of an isosceles triangle and the language of a circle. ● Use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS)	● Solve problems involving angles, triangles and circles. ● Understand and use facts about chords and their distance from the centre of a circle. ● Solve problems involving chords and radii.
16.2 Tangents	● Recall that the line drawn from the centre of a circle to the midpoint of a chord is at right angles to the chord. ● Know that the sum of the angles in a triangle must be 180° ● Recall the correct maths language for parts of a circle	● Understand and use facts about tangents at a point and from a point. ● Give reasons for angle and length calculations involving tangents.
16.3 Angles in circles 1	● Recall simple maths facts. ● Recall the correct maths language for parts of a circle	● Understand, prove and use facts about angles subtended at the centre and the circumference of circles. ● Understand, prove and use facts about the angle in a semicircle being a right angle. ● Find missing angles using these theorems and give reasons for answers.
16.4 Angles in circles 2	● Recall sum of angles of a triangle and a quadrilateral ● Recall correct maths language for parts of a circle.	● Understand, prove and use facts about angles subtended at the circumference of a circle. ● Understand, prove and use facts about cyclic quadrilaterals. ● Prove the alternate segment theorem.
16.5 Applying circle theorems	● Understand that $x^2 + y^2 = r^2$ is the equation of a circle with centre at the origin. ● Find the gradient of a line from its equation and know the gradient of a line perpendicular to it. ● Find the equation of the straight line, given a gradient and a coordinate. ● Recall circle theorems	● Solve angle problems using circle theorems. ● Give reasons for angle sizes using mathematical language. ● Find the equation of the tangent to a circle at a given point.
17 More algebra *(Edexcel Scheme of Work Unit 17: Changing the subject of formulae (more complex), algebraic fractions, solving equations arising from algebraic fractions, rationalising surds, proof)*	**Students should be able to simplify surds.** **Students should be able to use negative numbers with all four operations.** **Students should be able to add and multiply numeric fractions.** **Students should be able to recall and use the hierarchy of operations.** **Students should be able to manipulate algebraic expressions.** **Students should be able to recall and use the quadratic formula.**	
17.1 Rearranging formulae	● Substitute into linear equations. ● Change the subject of a formula. ● Factorise linear expressions.	● Change the subject of a formula where the power of the subject appears. ● Change the subject of a formula where the subject appears twice.
17.2 Algebraic fractions	● Simplify numeric fractions and fractions containing simple algebraic terms. ● Add and multiply numeric fractions.	● Add and subtract algebraic fractions. ● Multiply and divide algebraic fractions. ● Change the subject of a formula involving fractions where all the variables are in the denominators.

	Unit/section title	Prior knowledge	Unit objectives
	17.3 Simplifying algebraic fractions	● Factorise expressions by identifying the common factor between two terms. ● Simplify fractions containing simple algebraic terms. ● Factorise quadratic expressions of the form x2 + bx + c	● Simplify algebraic fractions.
	17.4 More algebraic fractions	● Simplify algebraic fractions by cancelling common factors. ● Add, subtract, divide and multiply fractions containing simple algebraic terms.	● Add and subtract more complex algebraic fractions. ● Multiply and divide more complex algebraic fractions.
	17.5 Surds	● Decide whether each number is rational or irrational.	● Simplify expressions involving surds. ● Expand expressions involving surds. ● Rationalise the denominator of a fraction.
	17.6 Solving algebraic fraction equations	● Find the lowest common multiple of two algebraic fractions. ● Solve quadratic equations by factorising. ● Manipulate expressions containing simple algebraic fractions.	● Solve equations that involve algebraic fractions.
	17.7 Functions	● Calculate the output from a function machine for three different inputs. ● Solve simple equations ● Write expressions using function machines	● Use function notation. ● Find composite functions. ● Find inverse functions.
	17.8 Proof	● Identify an odd number and an even number written algebraically. ● Recall the definitions of equations and identities.	● Prove a result using algebra.
	End of year test		

Higher Year 5 Scheme of Work

Term	Unit/section title	Prior knowledge	Unit objectives
	18 Vectors and geometric proof *(Edexcel Scheme of Work Unit 18: Vectors and geometric proof)*	**Students should be able to use vectors to describe translations.** **Students should be able to recall and use Pythagoras' Theorem.** **Students should recall the properties of triangles and quadrilaterals.** **Students should be able to express the relationship between two quantities as a ratio.** **Students should be able to simplify surds.**	
	18.1 Vectors and vector notation	● Use vectors to describe translations. ● Recall and use Pythagoras' Theorem. ● Simplify surds.	● Understand and use vector notation. ● Work out the magnitude of a vector.
	18.2 Vector arithmetic	● Understand the components of a vector and use vectors to describe translations. ● Recall properties of triangles and quadrilaterals.	● Calculate using vectors and represent the solutions graphically. ● Calculate the resultant of two vectors.
	18.3 More vector arithmetic	● Use properties of a parallelogram to identify equal and parallel lines. ● Add two column vectors.	● Solve problems using vectors. ● Use the resultant of two vectors to solve vector problems.
	18.4 Parallel vectors and collinear points	● Identify parallel column vectors. ● Add and subtract column vectors.	● Express points as position vectors. ● Prove lines are parallel. ● Prove points are collinear.
	18.5 Solving geometric problems	● Understand the relationship between ratio and fractional parts ● Identify parallel vectors	● Solve geometric problems in two dimensions using vector methods. ● Apply vector methods for simple geometric proofs.

	19 Proportion and graphs *(Edexcel Scheme of Work Unit 19: Direct and indirect proportion: using statements of proportionality, reciprocal and exponential graphs, rates of change in graphs, functions, transformations of graphs)*	**Students should be able to draw linear and quadratic graphs.** **Students should recognise linear and quadratic graphs.** **Students should be able to calculate the gradient of a linear function between two points.** **Students should recall transformations of trigonometric functions.** **Students should have knowledge of writing statements of direct proportion and forming an equation to find values.** **Students should be able to recognise a graph showing direct proportion.** **Students should be able to recall and use the formula speed = distance ÷ time.**	
A u t u m n t e r m	**19.1 Direct proportion**	● Recognise direct proportion ● Write equations for quantities in direct proportion.	● Write and use equations to solve problems involving direct proportion.
	19.2 More direct proportion	● Use direct proportion. ● Find the constant of proportionality.	● Write and use equations to solve problems involving direct proportion. ● Solve problems involving square and cubic proportionality.
	19.3 Inverse proportion	● Using inverse proportion to solve simple problems. ● Write equations for quantities in direct proportion.	● Write and use equations to solve problems involving inverse proportion. ● Use and recognise graphs showing inverse proportion.
	19.4 Exponential functions	● Evaluate indices	● Recognise graphs of exponential functions. ● Sketch graphs of exponential functions.
	19.5 Non-linear graphs	● Work out the area of a trapezium ● Recall and use the formula speed = distance ÷ time. ● Find the gradient of a line between two given points.	● Calculate the gradient of a tangent at a point. ● Estimate the area under a non-linear graph.
	19.6 Translating graphs of functions	● Translating coordinates ● Function notation	● Understand the relationship between translating a graph and the change in its function notation.
	19.7 Reflecting and stretching graphs of functions	● Transformation of functions	● Understand the effect stretching a curve parallel to one of the axes has on its function form. ● Understand the effect reflecting a curve in one of the axes has on its function form.
	End of term test		