

Mathematics

We believe that all our students can be Mathematicians, who enjoy and excel in mathematics at all levels. All students, irrespective of ability, should be given the opportunity to achieve their full potential in mathematics.

We are aiming for all our students to be:

- Fluent in the fundamentals of mathematics so they can master the subject
- Good communicators by clearly explaining their thoughts and giving reasons
- Resilient problem solvers who have the confidence to try and try again
- Committed to the 'why', not just the 'how'

At Cornwallis Academy, we teach the National Curriculum for Mathematics, which aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and can recall and apply their knowledge rapidly and accurately to problems
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

Year 9 Mathematics

Unit One

Content of study	Number
What are the aims and objectives of this term?	1.1 Calculations • Apply systematic listing strategies • Use priority of operations with positive and negative numbers • Simplify calculations by cancelling • Use inverse operations 1.2 Decimal numbers • Round to a given number of decimal places • Multiply and divide decimal numbers 1.3 Place value • Convert metric measures • Write decimal numbers of millions • Round to a given number of significant figures • Estimate answers to calculations • Use one calculation to find the answer to another 1.4 Factors and multiples • Recognise 2-digit prime numbers • Find factors and multiples of numbers • Find common factors and common multiples of two numbers • Find the HCF and LCM of two numbers by listing 1.5 Squares, cubes and roots • Find square roots and cube roots • Recognise powers of 2, 3, 4 and 5

	- Understand surd notation on a calculator 1.6 Index notation - Use index notation for powers of 10 - Use index notation in calculations - Use the laws of indices 1.7 Prime factors - Write a number as the product of its prime factors - Use prime factor decomposition to find the HCF and LCM
What previous knowledge is required?	- Students will have an appreciation of place value and recognise even and odd numbers. - Students will have knowledge of using the four operations with whole numbers. - Students should have knowledge of integer complements to 10 and to 100. - Students should have knowledge of strategies for multiplying and dividing whole numbers by 2, 4, 5, and 10. - Students should be able to read and write decimals in figures and words
How will this term's content help with future learning?	- To use ratio notation - To write a ratio in its simplest form - To write ratios in the form of 1: n - To recognise and use proportion to solve problems - To divide an amount by a given ratio - To combine ratios and fractions - To convert between units of area and volume - To recognise and use proportion on graphs - To write and use equations to solve problems involving direct proportion (higher only) - To solve problems involving square and cubic proportionality (higher only) - To write and use equations to solve problems involving inverse proportion (higher only) - To recognise and use graphs showing direct and inverse proportion (higher only) - Convert between FDP - Calculate percentage change - Express ordinary numbers in standard form and vice versa - Use standard form to solve problems
Resources	- Tutorial videos for all topics and interactive questions available at Sparx Maths - Home All students provided with an account - Tutorial videos and practice exam questions available at www.mathsgenie.co.uk - Tutorial videos, practice questions and practice exam questions available at www.corbettmaths.com - Additional revision resources available at www.bbc.co.uk/bitesize
Links to the national curriculum/specification	Mathematics programmes of study: key stage 3 (publishing.service.gov.uk) understand and use place value for decimals, measures and integers of any size

	- order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols $=$, $\neq$, $<$, $>$, $\leq$, $\geq$ - use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property - use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative - use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals - recognise and use relationships between operations including inverse operations - use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations
Assessments	Students will sit an assessment at the end of this unit. This is accompanied by a Yellow Assessment Point that students will use to review their performance in each question. The YAP also has information on Sparx Maths video clips and quizzes linked to each question. Following the assessment, students will watch the clips and complete the quizzes relating to any questions that were identified as needing attention. Students will then be required to complete a progress task to demonstrate improvement on their weaker areas.
Unit Two	
Content of study	Algebra
What are the aims and objectives of this term?	2.1 Algebraic expressions: - Use correct algebraic notation - Write and simplify expressions 2.2 Simplifying expressions: - Use the index laws - Multiply and divide expressions 2.3 Substitution - Substitute numbers into expressions - Write more complex expressions 2.4 Formulae - Recognise the difference between a formula and an expression - Write and use formula 2.5 Expanding brackets - Expand brackets - Simplify expressions with brackets - Write and use formulae with brackets

	2.6 Factorising - Factorise algebraic expressions - Use the identity and the not equal to symbols 2.7 Using expressions and formulae - Write expressions and simple formulae - Use formulae
What previous knowledge is required?	- 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; - use negative numbers with the four operations, recall and use the hierarchy of operations and understand inverse operations. - deal with decimals and negatives on a calculator. - use index laws numerically.
How will this term's content help with future learning?	Simultaneous Equations: - two simultaneous equations in two variables (linear/linear algebraically; find approximate solutions using a graph - solve quadratic equations (including those that require rearrangement) algebraically by factorising, by completing the square and by using the quadratic formula; find approximate solutions using a graph - solve two simultaneous equations in two variables (linear/linear or linear/quadratic) algebraically; find approximate solutions using a graph - find approximate solutions to equations numerically using iteration - translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution - solve linear inequalities in one or two variable(s), and quadratic inequalities in one variable; represent the solution set on a number line, using set notation and on a graph Sequences: - generate terms of a sequence from either a term-to-term or a position-to-term rule - recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions (r^n where n is an integer, and r is a rational number > 0) - deduce expressions to calculate the nth term of linear sequences - deduce expressions to calculate the nth term of linear and quadratic sequences
Resources	- Tutorial videos for all topics and interactive questions available at Sparx Maths - Home All students provided with an account - Tutorial videos and practice exam questions available at www.mathsgenie.co.uk - Tutorial videos, practice questions and practice exam questions available at www.corbettmaths.com

	Additional revision resources available at www.bbc.co.uk/bitesize
Links to the specification	Mathematics programmes of study: key stage 3 (publishing.service.gov.uk) - use and interpret algebraic notation, including: - ab in place of $a \times b$ $3y$ in place of $y + y + y$ and $3 \times y$ a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$; $a^2 b$ in place of $a \times a \times b$ a/b in place of $a \div b$ - coefficients written as fractions rather than as decimals - Brackets - substitute numerical values into formulae and expressions, including scientific formulae - understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors - simplify and manipulate algebraic expressions to maintain equivalence by: - collecting like terms - multiplying a single term over a bracket - taking out common factors - expanding products of two or more binomials - understand and use standard mathematical formulae; rearrange formulae to change the subject - model situations or procedures by translating them into algebraic expressions or formulae and by using graphs - use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement)
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Unit Three

Content of study	Graphs, tables and charts
What are the aims and objectives of this term?	3.1 Frequency tables - Designing tables and data collection sheets - Reading data from tables 3.2 Two-way tables - Use data from tables - Design and use two-way tables 3.3 Representing data - Draw and interpret comparative and composite bar charts - Interpret and compare data shown in bar charts, line graphs and histograms

	3.4 Time series - Plot and interpret time series graphs - Use trends to predict what might happen in the future 3.5 Stem and leaf diagrams - Construct and interpret stem and leaf and back-to-back stem and leaf diagrams 3.6 Pie charts - Draw and interpret pie charts 3.7 Scatter graphs - Plot and interpret scatter graphs - Determine whether there is a relationship between sets of data 3.8 Line of best fit - Draw a line of best fit on scatter graphs - Use the line of best fit to predict values
What previous knowledge is required?	- Students should be able to use a ruler and protractor. - Students should understand angles as a measure of turning. - Students should be able to plot coordinates and read scales
How will this term's content help with future learning?	- Variance and standard deviation - Linear regression and correlation - Binomial distribution - Normal distribution - Confidence intervals
Resources	- Tutorial videos for all topics and interactive questions available at Sparx Maths - Home All students provided with an account - Tutorial videos and practice exam questions available at www.mathsgenie.co.uk - Tutorial videos, practice questions and practice exam questions available at www.corbettmaths.com - Additional revision resources available at www.bbc.co.uk/bitesize
Links to the specification	Mathematics programmes of study: key stage 3 (publishing.service.gov.uk) - interpret, analyse and compare the distributions of data sets - median, mean, mode and modal class and spread (range, including consideration of outliers) - Use and interpret scatter graphs; recognise correlation and know that it does not indicate causation; draw estimated lines of best fit; make predictions
Assessments	Students will sit an assessment at the end of this unit. This is accompanied by a Yellow Assessment Point that students will use to review their performance in each question. The YAP also has information on Sparx Maths video clips and quizzes linked to each question. Following the assessment, students will watch the clips and

	complete the quizzes relating to any questions that were identified as needing attention. Students will then be required to complete a progress task to demonstrate improvement on their weaker areas.
Unit Four	
Content of study	Fractions, decimals and percentages
What are the aims and objectives of this term?	4.1 Working with fractions • Compare fractions • Add and subtract fractions • Use fractions to solve problems 4.2 Operations with fractions • Find a fraction of a quantity or measurement • Use fractions to solve problems 4.3 Multiplying fractions • Multiply whole numbers, fractions and mixed numbers • Simplify calculations by cancelling 4.4 Dividing fractions • Divide a whole number by a fraction • Divide a fraction by a whole number or a fraction 4.5 Fractions and decimals • Convert fractions to decimals and vice versa • Use decimals to find quantities • Work out divisions with decimal answers • Write one number as a fraction of another 4.6 Fractions and percentages • Convert percentages to fractions and vice versa • Write one number as a percentage of another 4.7 Calculating percentages 1 • Convert percentages to decimals and vice versa • Find a percentage of a quantity • Use percentages to solve problems • Calculate simple interest 4.8 Calculating percentages 2 • Calculate percentage increases and decreases • Use percentages in real life situations • Calculate VAT
What previous knowledge is required?	• Students should be able to use the four operations of number. • Students should be able to find common factors. • Students have a basic understanding of fractions as being 'parts of a whole'. • Students should be able to define percentage as 'number of parts per hundred'. • Students should know number complements to 10 and multiplication tables.
How will this term's content help with future learning?	• work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $7\frac{1}{2}$ or 0.375 or $3\frac{3}{8}$) • identify and work with fractions in ratio problems

	• interpret fractions and percentages as operators • apply and interpret limits of accuracy • express a multiplicative relationship between two quantities as a ratio or a fraction • solve problems involving direct and inverse proportion, including graphical and algebraic representations • understand that X is inversely proportional to Y is equivalent to X is proportional to $1/Y$; interpret equations that describe direct and inverse proportion • interpret the gradient of a straight-line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion • interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of average and instantaneous rate of change (gradients of chords and tangents) in numerical, algebraic and graphical contexts (this does not include calculus)
Resources	• Tutorial videos for all topics and interactive questions available at Sparx Maths - Home All students provided with an account • Tutorial videos and practice exam questions available at www.mathsgenie.co.uk • Tutorial videos, practice questions and practice exam questions available at www.corbettmaths.com • Additional revision resources available at www.bbc.co.uk/bitesize
Links to the specification	Mathematics programmes of study: key stage 3 (publishing.service.gov.uk) • order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols $=, \neq, <, >, \leq, \geq$ • use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative • work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $2\frac{7}{10}$ or 0.375 and $\frac{3}{8}$) • define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100% • define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100% • interpret fractions and percentages as operators • use standard units of mass, length, time, money and other measures, including with decimal quantities • round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]
Assessments	Students will sit an assessment at the end of this unit. This is accompanied by a Yellow Assessment Point that students will use to review their performance in each question. The YAP also has information on Sparx Maths video clips and

	quizzes linked to each question. Following the assessment, students will watch the clips and complete the quizzes relating to any questions that were identified as needing attention. Students will then be required to complete a progress task to demonstrate improvement on their weaker areas.
Unit Five	
Content of study	Equations, inequalities and sequences
What are the aims and objectives of this term?	5.1 Solving equations 1 - Understand and use inverse operations - Solve simple linear equations 5.2 Solving equations 2 - Solve two-step equations 5.3 Solving Equations with brackets - Solve linear equations with brackets - Solve equations with unknowns on both sides 5.4 Introducing inequalities - Use correct notation to show inclusive and exclusive inequalities - Show inequalities on a number line - Write down integers that satisfy an inequality - Solve simple linear inequalities 5.5 More inequalities - Solve two sided inequalities 5.6 Using formulae - Substitute values into formulae and solve equations - Change the subject of a formula - Know the difference between an expression, an equation and a formula 5.7 Generating sequences - Recognise and extend sequences 5.8 Nth term - Use the nth term to generate terms of a sequence - Find the nth term of an arithmetic sequence
What previous knowledge is required?	Students should be able to substitute into a formula.
How will this term's content help with future learning?	Simultaneous Equations: - two simultaneous equations in two variables (linear/linear algebraically; find approximate solutions using a graph - solve quadratic equations (including those that require rearrangement) algebraically by factorising, by completing the square and by using the quadratic formula; find approximate solutions using a graph - solve two simultaneous equations in two variables (linear/linear or linear/quadratic) algebraically; find approximate solutions using a graph - find approximate solutions to equations numerically using iteration

	- translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution - solve linear inequalities in one or two variable(s), and quadratic inequalities in one variable; represent the solution set on a number line, using set notation and on a graph - generate terms of a sequence from either a term-to-term or a position-to-term rule - recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions (rn where n is an integer, and r is a rational number > 0) - deduce expressions to calculate the nth term of linear sequences - deduce expressions to calculate the nth term of linear and quadratic sequences
Resources	- Tutorial videos for all topics and interactive questions available at Sparx Maths - Home. All students provided with an account - Tutorial videos and practice exam questions available at www.mathsgenie.co.uk - Tutorial videos, practice questions and practice exam questions available at www.corbettmaths.com - Additional revision resources available at www.bbc.co.uk/bitesize
Links to the specification	Mathematics programmes of study: key stage 3 - use and interpret algebraic notation, including: ab in place of $a \times b$ $3y$ in place of $y + y + y$ and $3 \times y$ a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$; a^2b in place of $a \times a \times b$ a/b in place of $a \div b$ - coefficients written as fractions rather than as decimals - Brackets - substitute numerical values into formulae and expressions, including scientific formulae - understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors - simplify and manipulate algebraic expressions to maintain equivalence by: - collecting like terms - multiplying a single term over a bracket - taking out common factors - expanding products of two or more binomials - understand and use standard mathematical formulae; rearrange formulae to change the subject - model situations or procedures by translating them into algebraic expressions or formulae and by using graphs - use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement)

Assessments	Students will sit an assessment at the end of this unit. This is accompanied by a Yellow Assessment Point that students will use to review their performance in each question. The YAP also has information on Sparx Maths video clips and quizzes linked to each question. Following the assessment, students will watch the clips and complete the quizzes relating to any questions that were identified as needing attention. Students will then be required to complete a progress task to demonstrate improvement on their weaker areas.
Unit Six	
Content of study	Angles
What are the aims and objectives of this term?	6.1 Properties of shapes - Solve geometric problems using side and angle properties of quadrilaterals - Identify congruent shapes 6.2 Angles in parallel lines - Understand and use angle properties of parallel lines - Find missing angles using corresponding and alternate angles 6.3 Angles in triangles - Solve angle problems in triangles - Understand angle proofs about triangles 6.4 Exterior and interior angles - Calculate the interior and exterior angles of regular polygons 6.5 More exterior and interior angles - Calculate the interior and exterior angles of polygons - Explain why some polygons fit together and others do not 6.6 Geometrical problems - Solve angle problems using equations - Solve geometrical problems showing reasoning - Use x for the unknown to help you to solve problems
What previous knowledge is required?	- Students should be able to use a ruler and a protractor. - Students should understand angles as a measure of turning. - Students should be able to name angles and distinguish between acute, obtuse, reflex and right angles. - Students should recognise reflection symmetry, be able to identify and draw lines of symmetry, and complete diagrams with given number of lines of symmetry. - Students should recognise rotation symmetry and be able to identify orders of rotational symmetry, and complete diagrams with given order of rotational symmetry. - Students should be able to rearrange simple formulae and equations, as preparation for rearranging trigonometric formulae. - Students should recall basic angle facts. - Students should understand when to leave an answer in surd form.

	Students can plot coordinates in all four quadrants and draw axes.
How will this term's content help with future learning?	- identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation, reflection, translation and enlargement (including fractional scale factors) - identify and apply circle definitions and properties, including centre, radius, chord, diameter, circumference, tangent, arc, sector and segment - solve geometrical problems on coordinate axes - identify properties of the faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres - construct and interpret plans and elevations of 3D shapes
Resources	- Tutorial videos for all topics and interactive questions available at Sparx Maths - Home All students provided with an account - Tutorial videos and practice exam questions available at www.mathsgenie.co.uk - Tutorial videos, practice questions and practice exam questions available at www.corbettmaths.com - Additional revision resources available at www.bbc.co.uk/bitesize
Links to the specification	Mathematics programmes of study: key stage 3 (publishing.service.gov.uk) - derive and apply formulae to calculate and solve problems involving perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders) - calculate and solve problems involving perimeters of 2-D shapes (including circles), areas of circles and composite shapes - use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D - interpret mathematical relationships both algebraically and geometrically. - derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies
Assessments	Students will sit an assessment at the end of this unit. This is accompanied by a Yellow Assessment Point that students will use to review their performance in each question. The YAP also has information on Sparx Maths video clips and quizzes linked to each question. Following the assessment, students will watch the clips and complete the quizzes relating to any questions that were identified as needing attention. Students will then be required to complete a progress task to demonstrate improvement on their weaker areas.

Unit Seven	
Content of study	Averages and Range
What are the aims and objectives of this term?	7.1 Mean and range • Calculate the mean from a list and from a frequency table • Compare sets of data using the mean and range 7.2 Mode, median and range • Find the mode, median and range from a stem and leaf diagram • Identify outliers • Estimate the range from a grouped frequency table 7.3 Types of average • Recognise the advantages and disadvantages of each type of average • Find the mode, modal class and median from a frequency table 7.4 Estimating the mean • Estimate the mean of grouped data 7.5 Sampling • Understand the need for sampling • Understand how to avoid bias
What previous knowledge is required?	• calculate and interpret the mean as an average • know when it is appropriate to find the mean of a data set
How will this term's content help with future learning?	• Interpret, analyse and compare the distributions of data sets from univariate empirical distributions
Resources	• Tutorial videos for all topics and interactive questions available at Sparx Maths - Home All students provided with an account • Tutorial videos and practice exam questions available at www.mathsgenie.co.uk • Tutorial videos, practice questions and practice exam questions available at www.corbettmaths.com • Additional revision resources available at www.bbc.co.uk/bitesize
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Links to the specification	Mathematics programmes of study: key stage 3 (publishing.service.gov.uk) • describe, interpret and compare observed distributions of a single variable through appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)

Unit Eight	
Content of study	Perimeter, area and volume
What are the aims and objectives of this term?	8.1 Rectangles, parallelograms and triangles - Calculate the perimeter and area of rectangles, parallelograms and Triangles - Calculate a missing length given the area 8.2 Trapezia and changing units - Calculate the area and perimeter of trapezia - Find the height of a trapezium given its area - Convert between area measures 8.3 Area of compound shapes - Calculate the perimeter and area of shapes made from triangles and rectangles - Calculate areas in hectares, and convert between ha and m² 8.4 Surface area of 3D solids - Calculate the surface area of a cuboid - Calculate the surface area of a prism 8.5 Volume of prisms - Calculate the volume of a cuboid - Calculate the volume of a prism - Use a flow diagram to solve problems 8.6 More volume and surface area - Convert between measures of volume - Solve problems involving surface area and volume
What previous knowledge is required?	- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate - use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places - convert between miles and kilometres - recognise that shapes with the same areas can have different perimeters and vice versa - recognise when it is possible to use formulae for area and volume of shapes - calculate the area of parallelograms and triangles - calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres and cubic metres, and extending to other units
How will this term's content help with future learning?	- construct and interpret plans and elevations of 3D shapes - calculate arc lengths, angles and areas of sectors of circles - calculate surface areas and volumes of spheres, pyramids, cones and composite solids - apply the concepts of congruence and similarity, including the relationships between lengths, {areas and volumes} in similar figures

Resources	- Tutorial videos for all topics and interactive questions available at Sparx Maths - Home All students provided with an account - Tutorial videos and practice exam questions available at www.mathsgenie.co.uk - Tutorial videos, practice questions and practice exam questions available at www.corbettmaths.com - Additional revision resources available at www.bbc.co.uk/bitesize
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Links to specification	Mathematics programmes of study: key stage 3 (publishing.service.gov.uk) - derive and apply formulae to calculate and solve problems involving perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders) - calculate and solve problems involving perimeters of 2-D shapes (including circles), areas of circles and composite shapes

Unit Nine

Content of study	Graphs
What are the aims and objectives of this term?	9.1 Coordinates - Find the midpoint of a line segment - Recognise, name and plot straight line graphs - Recognise, name and plot the graphs of $y=x$ and $y=-x$ 9.2 Linear graphs - Generate and plot coordinates from a rule - Plot straight line graphs from tables of values - Draw graphs to represent relationships 9.3 Gradient - Find the gradient of a line - Identify and interpret the gradient from an equation - Understand that parallel lines have the same gradient 9.4 $Y=mx+c$ - Understand what m and c represent in $y=mx+c$ - Find the equations of straight-line graphs - Sketch graphs given the values of m and c 9.5 Real life graphs - Draw and interpret graphs from real data 9.6 Distance time graphs - Use distance-time graphs to solve problems - Draw distance-time graphs - Interpret rate of change on graphs 9.7 More real life graphs

	• Draw and interpret a range of graphs • Understand when predictions are reliable
What previous knowledge is required?	• describe positions on the full coordinate grid (all four quadrants) • encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects
How will this term's content help with future learning?	• understand that X is inversely proportional to Y is equivalent to X is proportional to $\frac{1}{Y}$; {construct and} interpret equations that describe direct and inverse proportion • interpret the gradient of a straight-line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion • interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of instantaneous and average rate of change (gradients of tangents and chords) in numerical, algebraic and graphical contexts
Resources	• Tutorial videos for all topics and interactive questions available at Sparx Maths - Home All students provided with an account • Tutorial videos and practice exam questions available at www.mathsgenie.co.uk • Tutorial videos, practice questions and practice exam questions available at www.corbettmaths.com • Additional revision resources available at www.bbc.co.uk/bitesize
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Links to specification	Mathematics programmes of study: key stage 3 (publishing.service.gov.uk) • work with coordinates in all four quadrants • recognise, sketch and produce graphs of linear and quadratic functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane • interpret mathematical relationships both algebraically and graphically Mathematics – key stage 3 7 • reduce a given linear equation in two variables to the standard form $y = mx + c$; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically • use linear and quadratic graphs to estimate values of y for given values of x and vice versa and to find approximate solutions of simultaneous linear equations

	find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear, exponential and reciprocal graphs
Unit Ten	
Content of study	Transformations
What are the aims and objectives of this term?	10.1 Translation - Translate a shape on a coordinate grid - Use a column vector to describe a translation 10.2 Reflection - Draw a reflection of a shape in a mirror - Draw reflections on a coordinate grid - Describe reflections on a coordinate grid 10.3 Rotation - Rotate a shape on a coordinate grid - Describe a rotation 10.4 Enlargement - Enlarge a shape by a scale factor - Enlarge a shape using a centre of enlargement 10.5 Describing enlargements - Identify the scale factor of an enlargement - Find the centre of enlargement - Describe an enlargement 10.6 Combining transformations - Transform shapes using more than one transformation - Describe combined transformations of shapes on a grid
What previous knowledge is required?	- describe positions on the full coordinate grid (all four quadrants) - draw and translate simple shapes on the coordinate plane and reflect them in the axes.
How will this term's content help with future learning?	- interpret and use fractional {and negative} scale factors for enlargements - describe the changes and invariance achieved by combinations of rotations, reflections and translations
Resources	- Tutorial videos for all topics and interactive questions available at Sparx Maths - Home All students provided with an account - Tutorial videos and practice exam questions available at www.mathsgenie.co.uk - Tutorial videos, practice questions and practice exam questions available at www.corbettmaths.com - Additional revision resources available at www.bbc.co.uk/bitesize
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Links to specification	Mathematics programmes of study: key stage 3 (publishing.service.gov.uk) • describe translations as 2D vectors • identify properties of, and describe the results of, translations, rotations and reflections applied to given figures
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