KS3 COURSE STRUCTURE

	Units Delivered	
	Year 7	Year 8
Autumn 1	• 7.01: Sequences • 7.02: Understand and Use Algebraic Notation • 7.03: Equality and Equivalence	• 8.01: Ratio and Scale and Multiplicative Change • 8.02: Multiplying and dividing fractions
Autumn 2	• 7.04: Place value and ordering integers and decimals. • 7.05: Fractions, decimals, and percentages	• 8.03: Working in the Cartesian Plane • 8.04: Representing Data • 8.05: Tables and Probability
Spring 1	• 7.06: Solving problems with addition and subtraction • 7.07: Solving problems with multiplication and division	• 8.06: Brackets, equations, inequalities and sequences.
Spring 2	• 7.08: Fractions and percentages of an amount. • 7.09: Directed Number	• 8.07: Indices • 8.08: Fractions and Percentages • 8.09: Standard Index Form
Summer 1	• 7.10: Addition and subtraction of fractions • 7.11: Constructing, measuring and use geometric notation. • 7.12: Developing geometric reasoning	• 8.10: Number Sense • 8.11: Angles in Parallel Lines and Polygons. • 8.12: Area of Trapezia & Circles
Summer 2	• 7.13: Sets and Probability • 7.14: Prime Numbers and Proof	• 8.13: Line Symmetry • 8.14: The Data Handling Cycle and Measures of Location

	Progress Assessment Task Schedule	
	Year 7	Year 8
Autumn 1	1) GL Assessment 2) EOU for 7.01 3) EOU for 7.02 4) EOU for 7.03	1) GL Assessment 2) EOU for 8.01 3) EOU for 8.02
Autumn 2	1) EOU for 7.04 2) EOU for 7.05 3) End of Term Assessment	1) EOU for 8.03 2) EOU for 8.04 3) EOU for 8.05 4) End of Term Assessment
Spring 1	1) EOU for 7.06 2) EOU for 7.07	1) EOU for 8.06 2) EOU for 8.07
Spring 2	1) EOU for 7.08/9 2) End of Term Assessment	1) EOU for 8.08 2) End of Term Assessment
Summer 1	1) EOU of 7.10 2) EOU of 7.11	1) EOU for 8.09 2) EOU for 8.10 3) EOU for 8.11
Summer 2	1) EOU for 7.12 2) End of Year Assessment 3) EOU of 7.13/14	1) EOU for 8.12 2) End of Year Assessment

Unit Details	
Key Stage	3
Year Group	7
Unit Title	7.01: Sequences

Completion Schedule

Content Delivered

Prior Knowledge	• Describe and continue a sequence given diagrammatically. • Predict and check the next terms(s) in a sequence. • Continue numerical linear sequences. • Continue and identify the term-to-term rule of a sequence.
Core Concepts	• Represent sequences in tabular and graphical forms. • Recognise the difference between linear and non-linear sequences. • Describe and continue other sequences (Fibonacci, squares, cubes, triangular numbers) • Describe and continue geometric sequences.
Stretch and Challenge	• Find missing numbers within a sequence. • Find the rule for the nth term of a linear sequence. • Find the rule for the nth term of a sequence given diagrammatically.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Move freely between numerical, algebraic, graphical, and diagrammatic representations. • Make and test conjectures about patterns and relationships. • Use a calculator and other technologies to calculate results accurately and then interpret them appropriately. • Generate terms of a sequence from a term-to-term rule • Recognize arithmetic sequences. • Recognize geometric sequences and appreciate other sequences that arise.	Position Sequence Rule Table Graph Ascending Descending	Term Term-to-term Axes Linear Non-linear Arithmetic Geometric Fibonacci

Unit Details	
Key Stage	3
Year Group	7
Unit Title	7.02: Understand and use Algebraic Notation

Completion Schedule

Content Delivered

Prior Knowledge	• Given a numerical input, find the output of a function machine. • Given the numerical output, find the input of a function machine.
Core Concepts	• Know key terminology for algebra. • Understand and use algebraic notation. • Given an algebraic input, find the output of a function machine. • Given an algebraic output, find the input of a function machine. • Find the function machine given an expression. • Substitute values into single operation expression. • Substitute values into two-step expressions.
Stretch and Challenge	• Write an algebraic expression given in words. • Represent one-and two-step functions graphically. • Generate a sequence from a rule.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Move freely between numerical, algebraic, graphical, and diagrammatic representations. • Use algebra to generalise the structure of arithmetic, including formulate mathematical relationships. • Recognize and use relationships between operations including inverse operations. • Model situations or procedures by translating them into algebraic expression. • Substitute values in expressions, rearrange and simplify expressions.	Input Output Substitute Evaluate Order Rule Sequence Graph Curve Scale Operation	Function Estimate Inverse Expression Variable Coefficient Commutative Bar model Bracket Axis Axes

Unit Details	
Key Stage	3
Year Group	7
Unit Title	7.03: Equality and Equivalence

Completion Schedule	

Content Delivered	
Prior Knowledge	• Know key terminology for algebra. • Understand and use algebraic notation. • Mental methods for addition and subtraction. • Mental methods for multiplication and division.
Core Concepts	• Understand the meaning of equality and equivalence. • Solve one-step linear equations involving addition. • Solve one-step linear equations involving subtraction. • Solve one-step linear equations involving multiplication. • Solve one-step linear equations involving division. • Understand like and unlike terms. • Simplify algebraic expressions by collecting like terms, using the $\equiv$ symbol.
Stretch and Challenge	• Form and solve one-step equations written in words. • Form and solve equations for shapes and angles. • Solve equations with two or more steps.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships. • Simplify and manipulate algebraic expressions to maintain equivalence by collecting like terms. • Use approximation through rounding and estimate answers. • Use algebraic methods to solve linear equations in one variable.	Equality Equals Solution Is equal to Like Unlike Equivalent Collect Unknown Index	Equation Fact family Bar model Inverse Term Coefficient Simplify

Unit Details

Key Stage	3
Year Group	7
Unit Title	7.04: Place Value and ordering integers and decimals

Completion Schedule

Content Delivered

Prior Knowledge	• Understand and write integers up to one billion in words and figures. • Work out intervals on a number line. • Position integers on a number line. • Round integers to powers of ten. • Round decimals to powers of ten • Compare and order integers. • Find and interpret the median. • Find and interpret the range.
Core Concepts	• Understand and use the place value of decimals. • Position decimals on a number line. • Compare and order decimals. • Round integers to 1, 2 or 3 significant figures. • Round decimals to 1, 2 or 3 significant figures.
Stretch and Challenge	• Write 10, 100 and 1000 etc as powers of 10. • Convert ordinary numbers into standard form. • Convert standard form to an ordinary number.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Consolidate their understanding of the number system and place value to include decimals. • 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 $=, \neq, \leq, \geq$ • Work interchangeably with terminating decimals and their corresponding fractions. • Round numbers to an appropriate degree of accuracy • Describe, interpret, and compare observed distributions of a single variable through the median and the range. • Interpret and compare numbers in standard form	Digit Billion Million Gap Spaces Scale Interval Nearest Convention Halfway Compare Ascending Descending Order Greatest Least Difference Middle Positive Negative	Place value Placeholder Integer Equal division Approximation Round Not equal Greater than Less than Leading digit Range Average Median Tenth Hundredth Decimal Decimal point Significant figure Power Index Standard form Scientific notation

Unit Details

Key Stage	3
Year Group	7
Unit Title	7.05: Fractions, decimals and percentage

Completion Schedule

Content Delivered

Prior Knowledge	• Represent tenths and hundredths as diagrams. • Represent tenths and hundredths on number lines. • Represent any fraction as a diagram. • Understand the meaning of percentage using a hundred square. • Convert fluently between simple fractions, decimals and percentages.
Core Concepts	• Identify and calculate equivalent fractions. • Simplify fractions. • Convert between fractions and decimals (denominator a factor of 100) • Convert fluently between any fraction, decimal and percentage. • Compare and order fractions. • Compare and order fractions, decimals, and percentages. • Interpret pie charts.
Stretch and Challenge	• Convert between fractions and decimals (denominator not a factor of 100) • Convert fractions to recurring decimals. • Convert recurring decimals to fractions. • Convert between mixed numbers and improper fractions.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• consolidate their understanding of the number system and place value to include decimals, fractions. • move freely between different numerical representations [for example, equivalent fractions, fractions and decimals] • Extend their understanding of the number system; make connections between number relationships. • Express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1 • Define percentage as 'number of parts per hundred', interpret percentages as a fraction or a decimal • compare two quantities using percentages. • Work with percentages greater than 100% • Interpret pie charts	Digit Interval Equivalent Shaded Part Whole Division Fifth Quarter	Place value Placeholder Tenths Hundredths Decimal Fraction Eighth Percentage Pie chart Sector Denominator Numerator Quotient Improper Mixed number Rational Recurring

Unit Details	
Key Stage	3
Year Group	7
Unit Title	7.06: Solving Problems with Addition and Subtraction

Completion Schedule	
Content Delivered	
Prior Knowledge	• Mental strategies for addition and subtraction. • Use formal methods for addition of integers, • Use formal methods for subtraction of integers. • Adding decimals • Subtracting decimals • Calculate the perimeter of simple shapes. • Draw bar charts. • Interpret bar charts.
Core Concepts	• Solve problems involving addition and subtraction. • Solve problems with perimeter. • Solve financial maths problems. • Interpret bar and line graphs. • Construct a frequency tree. • Solve problems with frequency trees. • Solve problems involving tables and timetables.
Stretch and Challenge	• Add number written in standard form. • Subtract numbers written in standard form.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• use formal written methods, applied to positive integers and decimals • recognise and use relationships between operations including inverse operations • derive and apply formulae to calculate and solve problems involving: perimeter • construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts and pictograms for categorical data, and vertical line (or bar) charts for ungrouped numerical data	Total Sum Difference Decimal point Estimate Subtract Distance Units	Commutative Associative Inverse Partition Number bonds Carrying Placeholder Column method Polygon Frequency trees Standard form Exponent Significant figure

Unit Details

Key Stage	3
Year Group	7
Unit Title	7.07: Solving problems with multiplication and division

Completion Schedule

Content Delivered

Prior Knowledge	• Properties of multiplication and division • Use formal methods to multiply integers. • Use formal methods to divide integers. • Multiply and divide integers by powers of 10 • Calculate the area of a rectangle. • Calculate the area of a parallelogram. • Identify factors and multiples. • Calculate the mean.
Core Concepts	• Calculate the highest common factor of 2 or more numbers. • Calculate the lowest common multiple of 2 or more numbers. • Multiplying and dividing decimals by powers of 10. • Use formal methods to multiply decimals. • Use formal methods to divide decimals. • Convert metric units. • Understand and use order of operations. • Calculate the area of a triangle. • Solve problems using the area of shapes. • Solve problems involving the mean.
Stretch and Challenge	• Multiply by 0.1 and 0.01 • Calculate the area of a trapezium. • Calculate the area of a compound shape.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• use formal written methods, applied to positive integers and decimals • select and use appropriate calculation strategies to solve increasingly complex problems • recognise and use relationships between operations including inverse operations • use the concepts and vocabulary factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple • change freely between related standard units [time, length, area, volume/capacity, mass] • derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, and trapezia (H) • substitute numerical values into formulae and expressions, including scientific formulae • use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement) • describe, interpret and compare observed distributions of a single variable through: the mean	Multiply Divide Odd Even Multiple Metric Estimate Remainder Parallel Range Average	Inverse Quotient Commutative Factor Array Venn diagram Integer Divisor Dividend Quotient Parallelogram Perpendicular height Median Term Expression Coefficient Simplify

Unit Details

Key Stage	3
Year Group	7
Unit Title	7.08: Fractions and Percentages of an Amount

Completion Schedule

Content Delivered

Prior Knowledge	• Calculate a unit fraction of an amount. • Find a percentage of an amount without a calculator (10%, 5%, 1% etc) • Convert a fraction to a decimal.
Core Concepts	• Calculate a non-unit fraction of an amount. • Use a given fraction to find the whole. • Find a percentage of an amount with a calculator.
Stretch and Challenge	• Use a given fraction to find another fraction. • Write percentages over 100% as a decimal. • Calculate a percentage over 100% of an amount.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions • interpret fractions and percentages as operators	Fraction Equivalent Whole Percentage	Numerator Denominator

Unit Details

Key Stage	3
Year Group	7
Unit Title	7.09: Directed Number

Completion Schedule

Content Delivered

Prior Knowledge	• Order directed numbers using lines and appropriate symbols. • Perform calculations that cross zero.
Core Concepts	• Add directed numbers. • Subtract directed numbers. • Multiplication of directed numbers. • Division of directed numbers. • Use a calculator for directed number calculations. • Substitution with directed numbers. • Solve two-step equations. • Use order of operations with directed numbers.
Stretch and Challenge	• Calculate roots of positive numbers. • Calculate higher powers and roots.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• select and use appropriate calculation strategies to solve increasingly complex problems. • use the four operations, including formal written methods, applied to integers, both positive and negative • recognise and use relationships between operations including inverse operations • use square and square roots • use a calculator and other technologies to calculate results accurately and then interpret them appropriately • 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 • understand and use standard mathematical formulae	Positive Negative Reflection Ascending Descending Subtract Minus Substitute	Symmetric Zero pair Commutative Inverse Expression Square root Square Power Indices Exponent Root

Unit Details

Key Stage	3
Year Group	7
Unit Title	7.10: Addition and subtraction of fractions

Completion Schedule

Content Delivered

Prior Knowledge	• Simplify Fractions • Understand representations of fractions • Add and subtract fractions with the same denominator. • Identify and use equivalent fractions.
Core Concepts	• Convert between mixed numbers and improper fractions. • Add and subtract fractions from integers expressing the answer as a single fraction. • Add fractions with different denominators. • Subtract fractions with different denominators. • Use equivalence to add and subtract decimals and fractions.
Stretch and Challenge	• Add mixed numbers. • Subtract mixed numbers. • Add and subtract algebraic fractions.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• move freely between different numerical, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals] • express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1 • order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, , ≤, ≥ • select and use appropriate calculation strategies to solve increasingly complex problems • 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	Ascending Descending Multiple Equivalent Equivalent Solve Sequence Substitute	Fraction Numerator Denominator Unit fraction Lowest common multiple Common denominator Mixed number Improper fraction Commutative Equation Expression Linear Geometric Like terms

Unit Details

Key Stage	3
Year Group	7
Unit Title	7.11: Constructing, Measuring, and using Geometric Notation

Completion Schedule

Content Delivered

Prior Knowledge	- Draw and measure line segments. - Measure angles. - Classify angles. - Draw angles. - Use a pair of compasses. - Recognize types of triangles. - Recognize types of quadrilaterals - Identify polygons up to a decagon
Core Concepts	- Use the standard conventions for labelling the sides and angles of triangle ABC - Identify parallel and perpendicular lines. - Construct SSS triangles - Construct ASA triangles - Construct SAS triangles - Interpret pie charts using proportions. - Interpret pie charts using a protractor. - Draw a pie chart.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
- Use language and properties precisely to analyse 2-D shapes. - Begin to reason deductively in geometry including using geometrical constructions. - Draw and measure line segments and angles in geometric figures, including scale drawings. - Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right-angles, regular polygons, and other polygons that are reflectively and rotationally symmetric. - Use the standard conventions for labelling sides and angles. - Construct and interpret pie charts for categorical, ungrouped and grouped numerical data. - Identify and construct congruent triangles.	Line segment Height Width Rotation Quarter/half/three quarter/full turn Degrees Angle Interior Exterior Intersect Parallel Edges Frequency	Polygon Acute Obtuse Right-angle Reflex Protractor Equilateral Isosceles Scalene Square Rectangle Kite Rhombus Parallelogram Trapezium Perpendicular Vertices Sector Proportion

Unit Details

Key Stage	3
Year Group	7
Unit Title	7.12: Developing Geometric Reasoning

Completion Schedule

Content Delivered

Prior Knowledge	• Use the sum of angles in a right angle. • Use the sum of angles on a straight line. • Use the sum of angles at a point.
Core Concepts	• Use the equality of vertically opposite angles. • Use the sum of angles in a triangle. • Use the sum of angle to find missing angles in isosceles triangles. • Use the sum of angles in a quadrilateral. • Solve angle problems.
Stretch and Challenge	• Investigate the formula for the sum of the interior angles of a polygon. • Find interior angles in a regular polygon. • Investigate the angle sum of exterior angles. • Find the exterior angles in a regular polygon. • Use properties of corresponding and alternate angles. • Simple angle proofs.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Use language and properties precisely to analyse 2-D shapes. • Begin to reason deductively in geometry including using geometrical constructions. • Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right-angles, regular polygons, and other polygons that are reflectively and rotationally symmetric. • Use the standard conventions for labelling sides and angles. • Derive and illustrate properties of triangles, quadrilaterals, circles, and plane figures using appropriate language and technologies. • Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles. • Apply angle facts, triangle similarity and properties of quadrilaterals to derive result about angles and sides, and use known results to obtain simple proofs. • Understand and use relationship between parallel lines and alternate and corresponding angles. • Derive and use the sum of angles in a triangle and use it to deduce the angle sum of any polygon, and to derive properties of regular polygons.	Sum Angle Degrees Line segment Intersect Regular Interior Exterior Opposite Parallel	Adjacent Vertically opposite Isosceles Equilateral Scalene Right-angled Quadrilateral Convex Concave Parallelogram Rhombus Polygon Perpendicular Transversal Conjecture Corresponding Alternate Co-interior

Unit Details

Key Stage	3
Year Group	7
Unit Title	7.13: Sets and Probability

Completion Schedule

Content Delivered

Core Concepts	- Use set notation. - Interpret and create Venn diagrams. - Understand and use the intersection of sets. - Understand and use the union of sets. - Know and use the vocabulary of probability. - Understand and use the probability scale. - Calculate the probability of a single event. - Generate sample spaces for single events. - Know and use the sum of probabilities of all possible outcomes is 1.
Stretch and Challenge	Understand and use the complement of a set.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
- Record, describe and analyse the frequency of outcomes of single probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-11 probability scale. - Understand that the probabilities of all possible outcomes sum to 1. - Enumerate sets and unions/intersections of sets systematically, using tables, grid and Venn diagrams. - Generate theoretical sample spaces for single and combined events with equally likely and mutually exclusive events with equally likely and mutually exclusive outcomes and use these to calculate theoretical probabilities. - Appreciate the infinite nature of the sets of integers, real and rational numbers.	And Complement Union Or Impossible Likely Even chance Unlikely Certain Event Outcome	Universal set Element Set Venn diagram Intersection Mutually exclusive Sample space

Unit Details	
Key Stage	3
Year Group	7
Unit Title	7.14: Prime Numbers and Proof

Completion Schedule

Content Delivered

Prior Knowledge	- Identify multiples of a number. - Find any multiple of a number. - Identify factors of a number. - Find all the factors of a number. - Calculate and identify square numbers.
Core Concepts	- Find the lowest common multiple of two or more numbers. - Find the highest common factor of two or more numbers. - Solve problems using the HCF and LCM - Identify prime numbers. - Write a number as a product of prime factors. - Make and test conjectures.
Stretch and Challenge	- Use counterexamples to disprove a conjecture. - Find the LCM using a Venn diagram. - Find the HCF using a Venn diagram. - Use a Venn diagram to calculate factors of a number. - Use a Venn diagram to solve problems using the HCF and LCM.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
- Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common multiples, common factors, highest common factor, lowest common multiple, prime factorisation, including product notation and unique factorisation property. - Use integer powers and associated real root (square, cube and higher), recognise powers of 2, 3, 4 ,5 - Make and test conjectures about patterns and relationships; look for proofs or counterexamples. Begin to reason deductively in number and algebra.	Multiples Remainder	Integer Factor Divisor Factorise Prime number Odd Even Square number Prime factor Venn diagram Conjecture Counterexample

Unit Details	
Key Stage	3
Year Group	8
Unit Title	8.01: Ratio, Scale and Multiplicative Change

Completion Schedule

Content Delivered

Prior Knowledge	• Calculate the highest common factor of two or more numbers. • Addition and subtraction of fractions • Convert between units of time, length, and weight.
Core Concepts	• Understand the meaning, representation, and notation of ratio. • Write ratios in the form 1:n • Solve ratio problems given one amount. • Divide a value into a given ratio. • Express ratios in their simplest integer form. • Convert between ratios and fractions. • Solve problems with direct proportion. • Identify the radius and diameter of a circle. • Explore the ratio between sides in similar shapes. • Understand scale factors in the form 1:n. • Draw and interpret scale drawings. • Interpret maps with scale factors and ratios. • Explore conversion graphs. • Convert between currencies.
Stretch and Challenge	• Express ratios in the form 1:n • Understand and link between gradients and ratio. • Calculate the gradient of a line. • Direct proportion graphs.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Make connections between number relationships, and their algebraic and graphical representations. • Use scale factor, scale diagrams and maps. • Understand that a multiplicative relationship between two quantities can be expressed as a ratio or fraction. • Divide a given quantity into two parts in a given part: part to part: whole ratio; express the division of a quantity into two parts as a ratio. • Extend and formalise their knowledge of ratio and proportion in working measures and in formulating proportional relations algebraically. • Interpret when the structure of numerical problems requires additive, multiplicative or proportional reasoning. • Use scale factors, scale diagrams and maps. • Solve problems involving direct and inverse proportion, including graphical and algebraic representations. • Move freely between different numerical, algebraic, graphical and diagrammatic representations.	Relationship Equal parts Order Units Total Share Equivalent Scale Compare Perimeter Regular Slope Approximation Conversion Exchange rate Estimate Enlargement	Ratio Proportion Colon Multiplier Place holder Simplify Factors Fraction Numerator Denominator Circumference Diameter Pi (π) Gradient Variable Linear Scale factor

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.02: Multiplication and Division of Fractions

Completion Schedule

Content Delivered	
Prior Knowledge	• Convert between mixed numbers and improper fractions. • Simplify fractions.
Core Concepts	• Multiply a fraction by an integer. • Multiply unit fractions. • Multiply any fractions. • Understand and use the reciprocal. • Divide a fraction by a unit fraction. • Divide any pair of fractions.
Stretch and Challenge	• Multiply a mixed number by an integer. • Multiply a mixed number by a fraction. • Multiply mixed numbers. • Divide an integer by a mixed number. • Divide a mixed number by an integer. • Divide mixed numbers. • Multiply algebraic fractions. • Divide algebraic fractions.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Consolidate their numerical and mathematical capability from KS2 and extend their understanding of the number system and place value to include decimals and fractions. • Select and use appropriate calculation strategies to solve increasingly complex problems. • Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.	Product Whole	Unit fraction Numerator Denominator Non-unit fraction Quotient Reciprocal Expression Term Mixed number Improper fraction Simplest form

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.03: Working in the Cartesian Plane

Completion Schedule

Content Delivered	
Prior Knowledge	• Read and write coordinates in the first quadrant. • Read and write coordinates in all four quadrants.
Core Concepts	• Identify and draw lines that are parallel to the axes. • Recognise, use, and draw the line $y = x$ • Recognise, use, and draw lines of the form $y = kx$ • Link $y = kx$ to direct proportion • Recognise, use, and draw lines of the form $y = x + a$ • Explore graphs with negative gradients. • Link graphs to linear sequences. • Use a table of values to plot graphs of the form $y = mx + c$
Stretch and Challenge	• Solve shape problems involving coordinates. • Recognise, use, and draw the line $y = -x$ • Calculate the gradient of a line given two points. • Calculate the gradient of a line given a graph. • Recognise and draw non-linear graphs. • Find the midpoint of a line segment.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Move freely between different numerical, algebraic, graphical and diagrammatic representations. • Develop algebraic and graphical fluency, including understanding linear (and simple quadratic) functions. • Make connections between number relationships, and their algebraic and graphical representations. • Substitute numerical value into formulae and expressions. • Recognise, sketch and produce graphs of linear functions of one variable with appropriate scaling, using equations in x and y and the cartesian plane.	Coordinates Horizontal Vertical Parallel Diagonal Scale Substitute Descending Ascending Slope Midpoint	Quadrant Axes Origin Equation Linear Non-linear Proportion Unitary Multiplier Intercept Ratio Gradient

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.04: Representing Data

Completion Schedule

Content Delivered	
Prior Knowledge	• Read and plot coordinates. • Read, interpret and complete ungrouped frequency tables. • Read, interpret and compete grouped frequency tables.
Core Concepts	• Interpret information from a scatter graph. • Understand and describe linear correlation. • Draw and plot points on a scatter graph. • Draw a line of best fit. • Use a line of best fit to estimate answers. • Identify outliers.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Describe, interpret, and compare observed distributions of a single variable through appropriate graphical representations including discrete, continuous, and grouped data. • Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data and vertical line (or bar) charts for ungrouped and grouped numerical data. • Describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs. • Use language and properties precisely to analyse probability and statistics.	Relationship Scale Coordinate Estimate Frequency Total Tally	Variable Axis Origin Correlation Line of best fit Extrapolate Outlier Discrete Continuous Qualitative Quantitative

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.05: Tables and Probability

Completion Schedule

Content Delivered	
Prior Knowledge	• Identify factors, multiples and primes. • Use set notation. • Draw and interpret Venn diagrams. • Understand and use the intersection of sets. • Understand and use the union of sets. • Understand and use the complement of set.
Core Concepts	• Construct sample space diagrams. • Use probability notation. For example, P(event) • Find probabilities from sample space diagrams. • Construct a two-way table. • Interpret a two-way table. • Find probabilities from a two-way table. • Find probabilities from Venn diagrams.
Stretch and Challenge	• Use the product rule to find the total number of possible outcomes. • Find conditional probabilities from a two-way table. • Solve problems using a two-way table.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale. • Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities. • Use language and properties precisely to analyse probability and statistics	Outcomes Chance Event Equally likely Union Intersection Region Produce	Sample space Set Probability Systematic Unbiased Two-way table Denominator

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.06: Brackets, Equations, Inequalities and Sequences

Completion Schedule

Content Delivered

Prior Knowledge	• Know key terminology for algebra. • Understand and use algebraic notation. • Solve one-step linear equations involving addition. • Solve one-step linear equations involving subtraction. • Solve one-step linear equations involving multiplication. • Solve one-step linear equations involving division. • Substituting into expressions.
Core Concepts	• Use directed number with algebra. • Expand a single bracket. • Expand and simplify single brackets. • Factorise into a single bracket (HCF is a number) • Factorise into a single bracket (HCF is a variable) • Factorise into a single bracket (HCF is a number and a variable) • Solve equations with brackets. • Form algebraic expressions. • Form and solve equations with brackets. • Solve one-step inequalities. • Solve two-step inequalities. • Form and solve inequalities. • Generate a sequence given a rule in words. • Generate a sequence given a simple algebraic rule. • Generate a sequence given a complex algebraic rule. • Find the rule for the nth term of a linear sequence
Stretch and Challenge	• Expand a pair of binomials. • Solve equations with unknowns on both sides. • Form and solve equations with unknowns on both sides. • Form and solve inequalities with unknowns on both sides.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary

• Identify variables and express relationships between variables algebraically.
• Begin to model situations mathematically and express the result using a range of formal mathematical representations.
• 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.
  ❖ Use algebraic methods to solve linear equations in one variable.
• Generate terms of a sequence from either a term-to-term or position-to-term rule.
• Recognise arithmetic sequences and find the nth term.
• Recognise geometric sequences and appreciate other sequences that arise.
	Substitute
	Equivalent
	Positive
	Negative
	Directed
	Bracket
	Expand
	Identity
	Product
	Solution
	Unknown
	Form
	Sequence
		Expression
		Simplify
		Term
		Coefficient
		Solve
		Factor
		Factorise
		HCF
		Like terms
		Binomial
		Quadratic
		Unlike terms
		Solution set
		Inequality
		Equation
		Formula
		Fibonacci
		Constant

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.07: Indices

Completion Schedule

Content Delivered	
Prior Knowledge	• Simplify algebraic expressions by collecting like terms. • Add expression with indices. • Subtract expressions with indices
Core Concepts	• Simplify algebraic expressions by multiplying indices. • Simplify algebraic expressions by dividing indices. • Understand and use the zero power. • Use the addition law of indices. • Use the subtraction law of indices.
Stretch and Challenge	• Explore powers of powers. • Understand and use negative indices. • Understand and use fractional indices.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Use and interpret algebraic notation including a^3 in place of $a \times a \times a$; a^2b in place of $a \times a \times b$ • Use language and properties precisely to analyse algebraic expressions. • Begin to model situations mathematically and express the results using a range of formal mathematical representations. • Substitute value in expressions, rearrange and simplify expression and solve equations.	Multiply Product Expand Base	Expression Simplify Term Coefficient Index/indices Powers Numerator Denominator Factor Exponent

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.08: Fractions and Percentages

Completion Schedule

Content Delivered

Prior Knowledge	• Convert fluently between simple fractions, decimals and percentages. • Convert fluently between any fraction, decimal and percentage. • Calculate fractions of an amount without a calculator. • Calculate fractions of amounts with a calculator. • Find a percentage of amounts without a calculator. • Find a percentage of amounts with a calculator.
Core Concepts	• Convert between decimals and percentages greater than 100% • Calculate percentage increase and decrease without a calculator. • Percentage decrease with a multiplier. • Percentage increase with a multiplier. • Express one number as a fraction of another • Express one number as a percentage of another • Calculate percentage change.
Stretch and Challenge	• Calculate original value given a percentage. • Calculate original value following a percentage increase. • Calculate original value following a percentage decrease.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics. • Work interchangeably with terminating decimals and their corresponding fractions • 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	Equivalent Increase Decrease Multiple Original Reverse Profit Loss	Fraction Decimal Percentage Denominator Numerator Rounding Multiplier Factor

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.09: Standard Index Form

Completion Schedule

Content Delivered	
Prior Knowledge	• Multiply and divide by powers of 10
Core Concepts	• Write 10, 100, 1000 etc as powers of 10 • Write numbers greater than one in standard form. • Convert numbers in standard form to an ordinary number (greater than one). • Investigate negative powers of 10. • Write numbers between zero and one in standard form. • Convert numbers in standard form to an ordinary number (between zero and one). • Order numbers in standard form. • Correct numbers not written in standard form. • Multiply numbers written in standard form. • Divide numbers written in standard form.
Stretch and Challenge	• Add number written in standard form. • Subtract numbers written in standard form. • Standard form with a calculator.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• 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 • interpret and compare numbers in standard form $A \times 10n$, $1 \le A < 10$, where n is a positive or negative integer or zero	Base Positive Negative Root	Index/indices Power Exponent Standard form Commutative Scientific notation Reciprocal

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.10: Number Sense

Completion Schedule

Content Delivered	
Prior Knowledge	- Round numbers to powers of 10. - Round numbers to 1 decimal place. - Round integers to 1 significant figure. - Round decimals to 1 significant figure. - Understand and use order of operations.
Core Concepts	- Estimate answers to calculations. - Calculate with money. - Convert metric measures of length. - Convert units of weight and capacity. - Solve problems involving time and calendar.
Stretch and Challenge	- Write error interval for numbers rounded to powers of 10. - Write error interval for numbers rounded to the nearest integer. - Write error interval for numbers rounded to 1 decimals place. - Convert metric units of area. - Convert metric units of volume.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
- Use standard units of mass, length, time, money, and other measures including decimal quantities. - Round numbers and measures to an appropriate degree of accuracy (for example, to a number of decimal places or significant figures) - Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a < x \le b$ - Use a calculator and other technologies to calculate results accurately and then interpret them appropriately.	Significant figure Overestimate Underestimate Continuous Discrete Area	Round Power Integer Decimal place Root Index/indices Perpendicular

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.11: Angles in Parallel Lines and Polygons

Completion Schedule

Content Delivered

Prior Knowledge	• Use the standard conventions for labelling the sides and angles of triangle ABC • Use the sum of angles in a right angle. • Use the sum of angles on a straight line. • Use the sum of angles at a point. • Use the equality of vertically opposite angles. • Draw angles • Use a pair of compasses • Construct SSS triangles • Construct ASA triangles • Construct SAS triangles
Core Concepts	• Use properties of corresponding and alternate angles. • Use the properties of co-interior angles. • Solve problems involving angles in parallel lines. • Recall and use angle properties of quadrilaterals (squares, rectangles, trapezium, rhombi and parallelograms) • Investigate the formula for the sum of the interior angles of a polygon. • Find interior angles in a regular polygon • Investigate the angle sum of exterior angles. • Find the exterior angles in a regular polygon.
Stretch and Challenge	• Understand and use the properties of diagonals of quadrilaterals • Prove simple geometric facts • Construct an angle bisector • Construct a perpendicular bisector of a line segment

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles • understand and use the relationship between parallel lines and alternate and corresponding angles • derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons • use the standard conventions for labelling the sides and angles of triangle ABC • derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies • derive and use the standard ruler and compass constructions (H only)	Adjacent Parallel Kite Exterior Interior Regular	Vertically opposite Acute Reflex Obtuse Right-angle Alternate Corresponding Transversal Supplementary Co-interior Isosceles Equilateral Scalene Rhombus Parallelogram Square Trapezium Perpendicular Bisect Polygon Line segment

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.12: Area of Trapezia & Circles

Completion Schedule

Content Delivered

Prior Knowledge	• Calculate the perimeter of simple shapes. • Calculate the area of a rectangle. • Calculate the area of a triangle. • Calculate the area of a parallelogram.
Core Concepts	• Calculate the area of a trapezium. • Calculate the perimeter of a compound shape. • Calculate the area of compound shapes. • Recognise and label parts of a circle. • Calculate the area of a circle without a calculator. • Calculate the circumference of a circle without a calculator. • Calculate the area of a circle with a calculator • Calculate the circumference of a circle with a calculator.
Stretch and Challenge	• Calculate the area of a sector. • Calculate the area of fractional parts of a circle. • Calculate the length of an arc. • Calculate the perimeter of a fractional part of a circle.

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia. • calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes	Area Parallel Compound Approximately Estimate	Formula Square Parallelogram Rhombus Trapezium Perpendicular height Sector Radius Dimeter In terms of π Infinity Decimal place Significant figure

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.13: Line Symmetry

Completion Schedule

Content Delivered	
Prior Knowledge	• Recognise line symmetry. • Identify and draw lines that are parallel to the axes. • Recognise, use and draw the line $y = x$
Core Concepts	• Reflect a shape across horizontal and vertical lines. • Reflect a shape given the equation of a line. • Reflect a shape across a diagonal line • Reflect a shape across $y = x$ or $y = -x$ • Describe reflections

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric • identify properties of, and describe the results of reflections applied to given figures	Regular Reflect Vertical Horizontal Image Object	Line symmetry Polygon Isosceles Equilateral Congruent vertex

Unit Details

Key Stage	3
Year Group	8
Unit Title	8.14: The Data Handling Cycle and Measures of Location

Completion Schedule

Content Delivered	
Prior Knowledge	• Collect and record data using tables. • Draw and interpret tally charts • Represent, read and interpret grouped frequency tables. • Represent, read and interpret ungrouped frequency tables. • Interpret pictograms • Draw a pictogram • Interpret bar charts • Draw a bar chart • Draw and interpret a vertical line graph • Interpret a pie chart • Draw a pie chart • Find and interpret the range, mode, median and mean
Core Concepts	• Identify discrete and continuous data • Identify primary and secondary data • Set up a statistical enquiry • Design and criticise questionnaires • Identify outliers in lists of data. • Compare distributions. • Find and interpret the mode from an ungrouped frequency table. • Find and interpret the range from an ungrouped frequency table. • Interpret multiple bar charts (for example, dual bar charts) • Draw multiple bar charts • Interpret a line graph • Draw a line graph • Choose the appropriate diagram given sets of data • Represent and interpret grouped quantitative data • Identify misleading graphs.
Stretch and Challenge	• Find the mean from an ungrouped frequency table. • Estimate the mean from a grouped frequency table. • Find and interpret the modal class from a grouped frequency table. • Find and interpret the median from a grouped frequency table • Find and interpret the median from an ungrouped frequency table

National Curriculum content covered:	Tier Two Vocabulary	Tier Three Vocabulary
• 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 and spread • construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data. • describe, interpret and compare observed distributions of a single variable through appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)	Enquiry Questionnaire Tally Biased Average Mean Range Frequency Estimate Continuous Discrete Spread Intervals	Hypothesis Primary data Secondary data Pictogram Bar chart Line chart Pie chart Proportion Scatter graph Bivariate Grouped data Median Mode Modal class Outlier