# Curriculum Progression

# Mathematics

| Mathematics | | |
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| **Year 7** | **Topic** | **Programme of Study** |
| Autumn 1 | ***Sequences*** | Why This? This topic provides insights into patterns in nature, predictions, and making generalisations. It brings together concrete, pictoral and abstract representations. It provokes discussion and allows exploration of patterns in the real world.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 6 Algebra Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Describe and continue a sequence given diagrammatically<br>Predict and check the next term(s) of a sequence<br>Represent sequences in tabular and graphical forms<br>Recognise the difference between linear and non-linear sequences<br>Continue numerical linear sequences<br>Continue numerical non-linear sequences<br>Explain the term-to-term rule of numerical sequences in words<br>Find missing numbers within sequences<br>Key Vocabulary Sequence Term Position Rule Term-to-term Linear Non-linear, Difference Second difference Ascending Descending Geometric Fibonacci<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Mathspad, Dr Austin.<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Understand and use algebraic notation*** | Why This? This topic provides insights into functions, expressions and generalisations. It starts towards a deep understanding of the basic algebraic forms with more complex expressions being dealt with later. It brings together diagrammatical representations including function machines alongside bar models and algebraic representations.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 6 Algebra Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Given a numerical input, find the output of a single function machine<br>Use inverse operations to find the input given the output<br>Use diagrams and letters to generalise number operations<br>Use diagrams and letters with single function machines<br>Find the function machine given a simple expression<br>Substitute values into single operation expressions<br>Find numerical inputs and outputs for a series of two function machines<br>Use diagrams and letters with a series of two function machines<br>Find the function machines given a two-step expression<br>Substitute values into two-step expression<br>Generate sequences given an algebraic rule<br>Represent one- and two-step functions graphically<br>Key Vocabulary Function Input Output Estimate Operation Inverse Bar model Variable Coefficient Commutative Expression<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Equality and Equivalence*** | Why This? In this section students encounter forming and solving equations, building on their study of inverse operations. The equations met mainly require a calculator, which is deliberately so, to ensure understanding of how to solve equations rather than quickly spotting integer solutions. This work develops when two-step equations are met in the next place value unit.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the previous unit on inverses, and on the Year 6 Algebra Statutory Requirements. prepares students for the next place value – two step equations unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Understand the meaning of equality<br>Understand and use fact families, numerically and algebraically<br>Solve one-step linear equations involving +/- using inverse operations<br>Solve one-step linear equations involving x/÷ using inverse operations<br>Understand the meaning of like and unlike terms<br>Understand the meaning of equivalence<br>Simplify algebraic expressions by collecting like terms, using the ≡ symbol<br>Key Vocabulary Equality Equation Equals Is equal to Solve Solution Unknown Inverse Like/unlike Equivalent Simplify Collect<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Autumn 2 | ***Place Value & ordering integers & decimals*** | Why This? Topics from the last half term are interleaved into this new unit as students explore integers up to one billion and decimals to hundredths. Number lines also assist with later work on graphs and axes. Ordering numbers interleaves the median and range (separating them from other statistical measures to avoid overload). Sequences and equations from last term are interleaved.<br><br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 4 and Year 5 Number Statutory Requirements. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Recognise the place value of any number in an integer up to one billion<br>Understand and write integers up to one billion in words and figures<br>Work out intervals on a number line<br>Position integers on a number line<br>Round integers to the nearest power of ten<br>Compare two numbers using +, ≠, <, >, ≤, ≥<br>Order a list of integers<br>Find the range of a set of numbers<br>Understand place value for decimals<br>Position decimals on a number line<br>Compare and order any number up to one billion<br>Round a number to 1 significant figure<br>Write 10, 100, 1000 etc. as powers of ten<br>Write positive integers in the form A x 10n<br>Investigate negative powers of ten<br>Write decimals in the form A X 10n<br>Key Vocabulary Place value Digit Billion Placeholder Integer Interval Scale Gap Round Convention Approximate Nearest<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Fraction, decimal & percentage equivalence*** | Why This?<br>Building on the recent work on decimals, students gain a deep understanding of the links between fractions, decimals and percentages seen most in real life and their various representations. Pie charts are introduced by carefully interleaving them into the percentages work.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the previous term including sequences and equations, and on the Year 5 Number – fractions (including decimals and percentages) Statutory Requirements. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Represent tenths and hundredths as diagrams<br>Represent tenths and hundredths on number lines<br>Interchange between fractional and decimal number lines<br>Convert between fractions and decimals – tenths and hundredths<br>Convert between fractions and decimals – fifth and quarters<br>Convert between fractions and decimals – eighths and thousandths<br>Understand the meaning of percentage using a hundred square<br>Convert fluently between simple fractions, decimals and percentages<br>Use and interpret pie charts<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

| Mathematics | | |
|---|---|---|
| **Year 7** | **Topic** | **Programme of Study** |
| Spring 1 | ***Solving problems with addition and subtraction*** | Why This? This topic provides insights into applying both formal methods for adding and subtracting in the context of interpreting and problem solving and for developing mental strategies. Students can apply their skills in the context of perimeter, money, interpreting bar charts and tables and looking at frequency trees. These contexts lend themselves to being taught alongside addition and subtraction. Calculator skills for checking and supporting can also be used to develop calculator skills.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013 The timing of this unit has been carefully sequenced so that it builds upon formal methods developed in Key Stage 2. It reinforces the concepts and associated language from earlier studies of addition and subtraction and supports a deeper understanding through multiple representations. For those secure in this, there are opportunities for greater emphasis on interpreting and solving problems. This unit also allows for explicitly revisiting significant figures and for forming and solving equations.<br>Key Knowledge<br>Properties of addition and subtraction<br>Mental strategies for addition and subtraction<br>Use formal methods for addition of integers<br>Use formal methods for addition of decimals<br>Use formal methods for subtraction of integers<br>Use formal methods for subtraction of decimals<br>Choose the most appropriate methos: mental strategies, formal written or calculator<br>Solve problems in the context of perimeter<br>Solve financial maths problems<br>Solve problems involving tables and timetables<br>Solve problems with frequency trees<br>Solve problems with bar charts and line charts<br>Add and subtract numbers given in standard form (H)<br>Key Vocabulary Total, sum, difference, number line, commutative, associative, inverse, partition, carrying, exchange, place value, equivalence, estimating, equation, digit, polygon, profit, loss, balance, credit, debit, frequency, axes, scale, standard form, exponent, significant figure, million, billion<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths. Mathspad, Dr Austin<br>Curriculum Assessment tasks Regular Exit Tickets, end of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Solving problems with multiplication and division*** | Why This? This topic provides opportunities to apply formal and mental strategies for multiplying and dividing that allow for the study of forming and solving one and two step equations with and without a calculator. Students can apply their skills in forming and solving equations and in the context of problem solving, particularly through area of shapes and calculating the mean.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013 The timing of this unit has been carefully sequenced so that it builds upon formal and mental methods developed in Key Stage 2. Substitution and simplifying can be revised again. Order of operations is also explored through this topic which will be reinforced in a later unit when using directed numbers. Revisiting of rounding to one significant figure will help with conceptual understanding and helping to decide if students should be multiplying or dividing.<br>Key Knowledge<br>Properties of multiplication and division<br>Understand and use factors<br>Understand and use multiples<br>Multiply and divide integers and decimals by powers of 10<br>Multiply by 0.1 and 0.01 (H)<br>Convert metric units<br>Use formal methods to multiply integers<br>Use formal methods to multiply decimals<br>Use formal methods to divide integers<br>Use formal methods to divide decimals<br>Understand and use order of operations<br>Solve problems using the area of rectangles and parallelograms<br>Solve problems using the area of triangles<br>Solve problems using the area of trapezia (H)<br>Solve problems using the mean<br>Explore multiplication and division in algebraic expressions (H)<br>Key Vocabulary product, multiply, divide, inverse, quotient, commutative, factor, array, Venn diagram, integer, multiple, common, lowest common multiple, tenths, hundredth, place value, metric, milli-, centi-, kilo-,convert, litre, metre, gram, remainder, dividend, order operation, priority, base, perpendicular height, parallelogram, parallel, trapezium, mean, average, median, range, coefficient, expression, simplify, term<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths. Mathspad, Dr Austin<br>Curriculum Assessment tasks Regular Exit Tickets, end of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

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| | ***Fractions and percentages of amounts*** | Why This? This topic provides opportunities to make connections between calculating fractions and percentages of amounts and relating to real life problems. Use of a calculator and the percentage key can help them when making sense of real life problems such as calculating interest rates.<br><br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The timing of this unit has been carefully sequenced so that it builds upon work on place value, fractions and decimals and prepares them for more in-depth fractions and percentages work in year 8 to consolidate understanding and attempt increasingly difficult problems.<br><br>Key Knowledge<br>Find a fraction of a given amount<br>Use a given fraction to find the whole and/or other fractions<br>Find a percentage of a given amount using mental methods<br>Find a percentage of a given amount using a calculator<br>Solve problems with fractions greater than 1 and percentages greater than 100% (H)<br>Key Vocabulary Fraction, equivalent, numerator, denominator, whole, original, percent, percentage, decimal, convert<br><br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths. Mathspad, Dr Austin<br><br>Curriculum Assessment tasks Regular Exit Tickets, end of Unit low stakes testing, test corrections and follow up improvement check homework.<br><br>Personal Development links Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

| | | |
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| Spring 2 | ***Operations and equations with directed numbers*** | Why This? This topic extends and deepens student understanding of directed numbers. It allows students to recognise and use negative numbers in different contexts, including real life and to reflect on the nature of positive and negative numbers on a number line. The use of the +/- button on a calculator can be developed too.<br><br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013 The timing of this unit has been carefully sequenced so that it provides valuable opportunities for revising and extending earlier topics, notably algebraic areas such as substitution and the solution of equations. Students have met one-step equations and these can now be revised in order to move on to two-step equations. Practice of one-step equations can now of course include ones with negative solutions.<br><br>Key Knowledge<br>Understand and use representations of directed numbers<br>Order directed numbers using lines and appropriate symbols<br>Perform calculations that cross zero<br>Add directed numbers<br>Subtract directed numbers<br>Multiplication of directed numbers<br>Multiplication and division of directed number calculations<br>Evaluate algebraic expressions with directed number<br>Introduction to two-step equations<br>Solve two-step equations<br>Use order of operations with directed numbers<br>Roots of positive numbers (H)<br>Explore higher powers and roots (H)<br><br>Key Vocabulary positive, negative, reflective, symmetric, ascending descending, increase, decrease, greater than, less than, difference, add, subtract, minus, partition, product, multiply, inverse, commutative, substitute, expression, order of operations, indices, bracket, commutative, square, square root, inverse, power, positive, negative, root, exponent<br><br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths. Mathspad, Dr Austin<br><br>Curriculum Assessment tasks Regular Exit Tickets, end of Unit low stakes testing, test corrections and follow up improvement check homework.<br><br>Personal Development links Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

| | | |
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| | ***Addition and subtraction of fractions*** | Why This? This topic develops understanding of the equivalence of fractions with any denominator and the conceptual understanding of addition and subtraction of fractions including real life connections and interleaving with other topics in maths.<br><br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The timing of this unit has been carefully sequenced so that it builds upon the fractions, decimals and percentages work from the Autumn term. Reference back to finding lowest common multiples can be interleaved when finding common denominators and use of negative fractions can also be used to build on previous work with directed numbers. The use of fractions in the context of prior algebraic topics such as simplifying and substitution can also be introduced.<br><br>Key Knowledge<br>Understand representations of fractions<br>Convert between mixed numbers and fractions<br>Add and subtract unit fractions with the same denominator<br>Add and subtract fractions from integers expressing the answer as a single fraction<br>Understand and use equivalent fractions<br>Add and subtract fractions where denominators share a simple common multiple<br>Add and subtract fractions with any denominator<br>Add and subtract improper fractions and mixed numbers<br>Use fractions in algebraic contexts<br>Use equivalence to add and subtract decimals and fractions<br>Add and subtract simple algebraic fractions<br><br>Key Vocabulary equal parts, congruent, divide, numerator, denominator, ascending, descending, greater then, less than, unit fraction, whole, mixed number, integer, equivalent, lowest common multiple<br><br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths. Mathspad, Dr Austin<br><br>Curriculum Assessment tasks Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br><br>Personal Development links Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

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| Summer 1 | Constructing, Measuring and Using Geometric Notation | **Why This?**<br>This topic provides functional drawing skills that develops on skills learned in KS2 using rulers, protractors and other equipment to draw increasingly complex diagrams using correct mathematical notation. This will include three letter notations for angles, the use of hatch marks to indicate equality and the use of arrows to indicate parallel lines. Pie charts will also be studied here to gain further practice at drawing and measuring angles in a real-world context.<br>**Why Now?**<br>This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 6 Geometry Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Understand and use letter and labelling conventions including those for geometric figures.<br>Draw and measure line segments including geometric figures.<br>Understand angles as a measure of turn.<br>Classify angles.<br>Measure angles up to 180°.<br>Draw angles up to 180°.<br>Draw and measure angles between 180°.<br>Identify perpendicular and parallel lines.<br>Recognise types of triangles.<br>Recognise types of quadrilaterals.<br>Identify polygons up to a decagon.<br>Construct triangles using SSS.<br>Construct triangle using SSS, SAS and ASA.<br>Construct more complex polygons.<br>Interpret simple pie charts using proportion.<br>Interpret pie charts using a protractor.<br>Draw pie charts.<br>**Key Vocabulary**<br>Line, Line Segment, Geometric Figure, Notation, Polygon, Length, Height, Width, Figure, Degrees, Angle, Rotation, Acute, Obtuse, Right-Angle, Reflex, interior, Exterior, Angle, Measure, Sum, Protractor, intersect, Parallel, Equilateral, Isosceles, Scalene, Square, rectangle, rhombus, kite, parallelogram, trapezium, perpendicular.<br>**Sources** Bespoke lesson PowerPoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Active Learn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching PowerPoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

| | | |
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| | Developing Geometric Reasoning | **Why This?** This topic provides insights into basic geometric language, names and properties of triangles and quadrilaterals, and the names of other polygons. Angle rules will be introduced and used to form short chains of reasoning when investigating parallel lines.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 6 Geometry Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Understand and use the sum of angles at a point.<br>Understand and use the sum of angles on a straight line.<br>Understand and use the equality of vertically opposite angles.<br>Know and apply the sum of angles in a triangle.<br>Know and apply the sum of angles in a quadrilateral.<br>Solve angle problems using properties of triangles and quadrilaterals.<br>Solve complex angle problems.<br><br>**Key Vocabulary** Sum, angle, degrees, line segment, notation, adjacent, vertically opposite, intersect, line, isosceles, equilateral, scalene, right-angled, quad5rilateral, convex, concave, parallelogram, rhombus, point, polygon, regular, conjecture, transversal, alternate, corresponding, co-interior.<br>**Sources** Bespoke lesson PowerPoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Active Learn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching PowerPoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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|---|---|---|
| Summer 2 | Developing Number Sense | **Why This?** This topic provides insights into strategies for simplifying complex calculations and will extend their mental strategies with a focus on using a known fact to find other facts. This can be used in the form of estimation when completing tasks in real-world applications.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 6 Number Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Know and use mental addition and subtraction strategies for integers.<br>Know and use mental multiplication and division strategies for integers.<br>Know and use mental arithmetic strategies for decimals.<br>Know and use mental arithmetic strategies for fractions.<br>Use factors to simplify calculations.<br>Use estimation as a method for checking mental calculations.<br>Use known number facts to derive other facts.<br>Know when to use a mental strategy, formal written method or a calculator.<br>**Key Vocabulary** Compensation, number line, addition, subtraction, associative, commutative, partition, multiply, divide, associative, factors, place value, estimate, tenths, hundredths, thousandths, whole, equal parts, numerator, denominator, calculation, rounding, place value, significant figures, addend, product, quotient, expression<br>**Sources** Bespoke lesson PowerPoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Active Learn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching PowerPoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

| | | |
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| | Sets and Probability | **Why This?** This topic provides insights into the properties of number and FDP. Students will learn about sets, set notation and systematic listing strategies. This will aid them in describing and analysing the frequency of outcomes in different scenarios, and sample experiments involving fairness and likelihood of outcomes.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. Students have no prior knowledge of sets and probability from Year 6 or prior. This topic prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Identify and represent sets.<br>Interpret and create Venn diagrams.<br>Understand and use the intersection of sets.<br>Understand and use the union of sets.<br>Understand and use the complement of a set.<br>Know and use the vocabulary of probability.<br>Generate sample spaces for single events.<br>Calculate the probability of a single event.<br>Understand and use the probability scale.<br>Know that the sum of probabilities of all possible outcomes is 1.<br>**Key Vocabulary** Universal set, inclusive, element, member, set, Venn diagram, intersection, mutually exclusive, union, and, compliment, both, impossible, likely, even, unlikely, certain, random, bias, event.<br>**Sources** Bespoke lesson PowerPoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Active Learn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching PowerPoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

| | | |
|---|---|---|
| | Prime Numbers and Proof | **Why This?** Students will revisit factors and multiples to introduce the concept of prime numbers, Students will then develop their knowledge of odd, even, prime, square and triangular numbers as a basis of forming and testing conjectures; whilst also addressing counterexamples.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 5 Number Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Find and use multiples.<br>Identify factors of numbers and expressions.<br>Recognise and identify prime numbers.<br>Recognise square and triangular numbers.<br>Find common factors of a set of numbers including the HCF.<br>Find common multiples of a set of numbers including the LCF.<br>Write a number as a product of its prime factors.<br>Use a Venn diagram to calculate the HCF and LCF.<br>Make and test conjectures.<br>Use counterexamples to disprove a conjecture.<br>**Key Vocabulary** Multiples, integer, positive, zero, factor, divisible, remainder, term, factorise, divisor, multiple, prime, number, odd, even, digit, triangular number, relationship, investigate, square number, expression, common factor, highest common factor, lowest common multiple.<br>**Sources** Bespoke lesson PowerPoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Active Learn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching PowerPoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

| Mathematics | | |
|---|---|---|
| **Year 8** | **Topic** | **Programme of Study** |
| Autumn 1 | **Ratio and Scale** | Why This? This topic provides students with the opportunity to explore ratio using bar-modelling. Students will study the link between ratio and fractions.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 6 Ratio Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Understand the meaning and representation of ratio<br>Understand and use ratio notation<br>Solve problems involving ratios of the form 1:n (or n:1)<br>Solve proportional problems involving the ratio m:n<br>Divide a value into a given ratio<br>Express ratios in their simplest integer form<br>Express ratios in the form 1:n<br>Compare ratios and related fractions<br>Understand π as the ratio between diameter and circumference<br>Understand gradient of a line as a ratio<br>Key Vocabulary<br>Ratio<br>Proportion<br>Equal Parts<br>For every<br>Relationship<br>Order<br>Share<br>Simplify<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Dr Austin<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

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| | **Multiplicative Change** | Why This? This topic builds on work from the previous unit of work Ratio and Scale. Students will develop their understanding of these concepts using use various real-world examples such as converting between currencies, interpreting conversion graphs.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 8 Unit: Ratio and Scale and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Solve problems involving direct proportion<br>Explore conversion graphs<br>Convert between currencies<br>Explore relationships between similar shapes<br>Understand scale factors as a multiplicative representation<br>Draw and interpret scale diagrams<br>Interpret maps using scale factors and ratios<br>Key Vocabulary<br>Proportion<br>Ratio<br>Variable<br>Linear<br>Conversion<br>Exchange rate<br>Currency<br>Constant<br>Rate<br>Origin<br>Corresponding<br>Scale factor<br>Distance<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Dr Austin<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | **Multiplying and dividing fractions** | Why This? This topic builds on skills introduced in year 6. Students will develop their understanding of methods for multiplying and dividing integers and fractions. The will make links between fractions and decimals.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 6 Number and Place value (fractions and decimals) and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Represent multiplication of fractions<br>Multiply a fraction by an integer<br>Find the product of a pair of unit fractions<br>Find the product of a pair of any fractions<br>Divide an integer by a fraction<br>Divide a fraction by a unit fraction<br>Understand and use the reciprocal<br>Divide any pair of fractions<br>Key Vocabulary<br>Unit fraction<br>Numerator<br>Denominator<br>Product<br>Quotient<br>Whole<br>Mutiply/Divide<br>Reciprocal<br>Simplify<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Dr Austin<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

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| Autumn 2 | **Working in the cartesian plane** | **Why This?** This topic explores algebraic rules for straight lines, beginning with lines parallel to the axis and moving on to the more general form. Students will explore the gradient of lines and the form y = mx+c.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills first introduced in Year 4 Geometry and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Work with coordinates in all four quadrants<br>Identify and draw lines that are parallel to the axes<br>Recognise and use the line y = x<br>Recognise and use lines of the form y = kx<br>Link y = kx to direct proportion problems<br>Explore the gradient of the line y = kx<br>Recognise and use lines of the form y = x + a<br>Explore graphs with negative gradient (y = -kx, y = a – x, x + y = a)<br>Link graphs to linear sequences<br>Plot graphs of the form y = mx + c<br>Explore non-linear graphs<br>Find the midpoint of a line segment<br>**Key Vocabulary**<br>Quadrant<br>Coordinates<br>Horizontal/Vertical<br>Axis<br>Origin<br>Parallel<br>Equation<br>Straight-Line<br>Graph<br>Steep/Slope<br>Gradient<br>Linear<br>Intercept<br>Negative<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Dr Austin<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | **Representing Data** | **Why This?** This unit builds upon work from KS2. Students will learn about different types of data in real-life contexts. They will identify relationships between variables and use various graphical methods to record these.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills first introduced in the Year 6 Geometry: Position and Direction and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Draw and interpret scatter graphs<br>Understand and describe linear correlation<br>Draw and use line of best fit (1) & (2)<br>Identify non-linear relationships<br>Identify different types of data<br>Read and interrupt ungrouped frequency tables<br>Read and interrupt grouped frequency tables<br>Represent continuous data grouped into equal classes<br>Represent data in two-way tables<br>**Key Vocabulary**<br>Relationship<br>Correlation<br>Positive/Negative/Weak/Strong<br>Line of best fit<br>Origin<br>Outlier<br>Non-linear<br>Discrete/ Continuous<br>Qualitative/Quantitative<br>Frequency<br>Total<br>Tally<br>Range<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Dr Austin<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | **Tables and probability** | Why This? This topic further explores probability and using diagrams to answer questions about probability. Students will use two-way tables, sample space diagrams and venn diagrams.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 7 Sets and Probabilities Unit and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Construct sample spaces for 1 or more events<br>Find probabilities from a sample space<br>Find probabilities from two-way tables<br>Find probabilities from Venn diagrams<br>Use the product rule for finding the total number of possible outcomes<br>Key Vocabulary<br>Outcomes<br>Sample Space<br>Set<br>Probability/Chance<br>Event<br>Two-way table<br>Intersection<br>Region<br>Union<br>Possibilities<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Dr Austin<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

| Mathematics | | |
|---|---|---|
| **Year 8** | **Topic** | **Programme of Study** |
| Spring 1 | ***Brackets, equations and inequalities*** | Why This? Building on their understanding of equivalence from Year 7, students will explore expanding over a single bracket and factorising by taking out common factors. The higher strand will also explore expanding two binomials. All students will revisit and extend their knowledge of solving equations, now to include those with brackets and for the higher strand, with unknowns on both sides.<br>Students will also learn formal inequalities for the first time and learning the differences compared to equations.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 7 Algebra Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Form algebraic expressions<br>Use directed number with algebra<br>Multiply out a single bracket factorise into a single bracket<br>Expand multiple single brackets and simplify<br>Expand a pair of binomials<br>Solve equations, including with brackets<br>Form and solve equations with brackets<br>Understand and solve simple inequalities<br>Form and solve inequalities<br>Key Vocabulary Expression, Simplify, Term, Substitute, Coefficient, Equivalent, Solve, Positive, Negative, Identity, Product, Bracket, Expand, Multiply Out, Factorise, HCF, Like Terms, Unlike Terms, Quadratic, Binomial, Solution, Inequality, Satisfy, Greater/Less Than<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Sequences*** | Why This? This unit reinforces students' learning from the start of Year 7, extending this to look at sequences with more complex algebraic rules now that students are more familiar with a wider range of notation. This topic provides insights into patterns in nature, predictions, and making generalisations. It brings together concrete, pictoral and abstract representations. It provokes discussion and allows exploration of patterns in the real world.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 7 Algebra Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Generate sequences given a rule in words<br>Generate sequences given a simple algebraic rule<br>Generate sequences given a complex algebraic rule<br>Find the rule for the $n^{th}$ term of a linear sequence<br>Key Vocabulary Sequence, Term, Linear, Non-Linear, Difference, Constant, Term-To-Term, Substitute, $n^{th}$ term<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Indices*** | Why This? Before exploring more complex laws of indices, the groundwork is laid by making sure students are comfortable with expressions involving powers. The higher strand also looks at finding powers of powers. These important skills can then be applied to topics such as Standard Form which means students can solve important real-life problems involving extremely large numbers e.g. the mass of a planet or extremely small numbers e.g. the width of a cell. These skills can be transferred across Science and Geography.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 6 Algebra Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Adding and subtracting expressions with indices<br>Simplifying algebraic expressions by multiplying indices<br>Simplifying algebraic expressions by dividing indices<br>Using the addition law for indices<br>Using the addition and subtraction law for indices<br>Exploring powers of powers<br>Key Vocabulary Index/Indices/Power(s), Simplify, Expression, Coefficient, Term, Expand, Product, Base, Exponent<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

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| | ***Fractions and Percentages*** | Why This? This block focusses on the relationships between fractions and percentages including decimal equivalents and using these to work out percentage increase and decrease. Both calculator and non-calculator methods are developed. Percentages are extremely important in the context of Financial Maths e.g. profit, loss and interest. Students need to learn these vital skills in order to manage their own personal finances when they are older, and they are highly likely to apply skills in percentages in any future career they decide to go into.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 7 Place Value Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Convert fluently between key fractions, decimals and percentages<br>Calculate key fractions, decimals and percentages of an amount without a calculator<br>Calculate fractions, decimals and percentages of an amount using calculator methods<br>Convert between decimals and percentages greater than 100%<br>Percentage decrease with a multiplier<br>Calculate percentage increase and decrease using a multiplier<br>Express one number as a fraction or a percentage of another without a calculator<br>Express one number as a fraction or a percentage of another using calculator methods<br>Work with percentage change<br>Choose appropriate methods to solve percentage problems<br>Find the original amount given the percentage less than 100%<br>Find the original amount given the percentage greater than 100%<br>Choose appropriate methods to solve complex percentage problems<br>Key Vocabulary Fractions, Decimal, Percentage, Equivalent, Conversion, Multiplier, Growth, Profit, Loss, Reverse, Original<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Standard Index Form*** | Why This? Skills in Standard Form are extremely important in Science and Engineering. The skills they learn in this unit can be transferred into these disciplines. Scientists and Engineers solve important problems involving extremely large numbers e.g. the mass of a planet or extremely small numbers e.g. the width of a cell.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 8 Algebra Statutory Requirements and the earlier unit of Indices. This prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Investigate positive powers of 10<br>Work with numbers greater than 1 in standard form<br>Investigate negative powers of 10<br>Work with numbers between 0 and 1 in standard form<br>Compare and order numbers in standard form<br>Mentally calculate with numbers in standard form<br>Add and subtract numbers in standard form<br>Multiply and divide numbers in standard form<br>Use a calculator to work with numbers in standard form<br>Understand and use negative indices<br>Understand and use fractional indices<br>Key Vocabulary Index/Indices/Power(s), Standard (Index) Form, Coefficient, Term, Expand, Product, Base, Exponent, Negative, Commutative, SCI/EXP, Reciprocal<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Number Sense*** | Why This? This unit revises a lot of basic skills in a wide variety of contexts. Estimation is a key focus. Skills in estimation mean that students can check the plausibility of their answers throughout their Mathematical studies whether they decide to use a calculator or not. Conversion between metric units, including those of area and volume are key skills that students should be able to apply when solving problems in Science and Engineering.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 6 Number Statutory Requirements and the earlier unit of Indices. This prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>Key Knowledge<br>Round numbers to the powers of 10, and 1 significant figure<br>Round numbers to a given number of decimal places<br>Estimate the answer to a calculation<br>Understand and use error interval notion<br>Calculate using the order of operations<br>Calculate with money<br>Convert metric measures of length<br>Convert metric units of weight and capacity<br>Convert metric units of area<br>Convert metric units of volume<br>Solve problems involving time and the calendar<br>Key Vocabulary Round, Significant, Power, Integer, Estimate, Significant Figure, Bound, Continuous, Discrete, Root, Power, Deposit, Interest, Credit,<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

| Year 8 | Topic | Programme of study |
|---|---|---|
| Summer 1 | Angles In parallel lines & polygons | **Why This?** This topic provides insights into their uses and applications in real life. When designing structures or laying out roadways, the corresponding angle axiom is used to ensure that parallel lines intersected by a transversal form congruent angle, which is essential for creating stable and symmetrical structures.<br>construction of buildings, they are also interconnected with fields such as physics and chemistry.<br>Most architects and engineers use angles in the professional activities for building roads, houses, architectures and machines. The importance of angles is to assist in structure measurement and developing symmetrical forms.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills such as addition, subtraction, multiplication, division, ratios, drawing/measuring lines/shapes and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Understand and use basic angles rules and notation<br>Investigate angles between parallel lines and the transversal Identify and calculate with alternate and corresponding angles Solve complex problems with parallel line angles<br>Constructions triangles and special quadrilaterals<br>Investigate the properties of special quadrilaterals<br>Identify and calculate with sides and angles in special quadrilaterals<br>Understand and use the properties of diagonals of quadrilaterals Understand and use the sum oof the interior angles in any polygon<br>Calculate missing interior angles in regular polygons<br>Prove simple geometric facts<br>Construct an angle bisector<br>Construct a perpendicular bisector of a line segment<br>**Key Vocabulary**<br>Parallel, Transversal, Angle, Alternate, Corresponding, Vertically Opposite, Co-interior, Transversal Line, Supplementary Points, Isosceles, Equilateral, Scalene, Right-angled, Rhombus, Parallelogram, Square, Trapezium, Rectangle, Kite, Bisect, Exterior, Interior, Regular Polygon, Sum, Total, Pentagon/Hexagon etc.<br>**Sources:** Bespoke lesson PowerPoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Active Learn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching PowerPoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | Area of Trapezia and Circles | **Why This?** This topic provides insights into the use and application of area in real life. Area calculations are used in construction, such as calculating paint coverage. In fashion, handbag designs are frequently based around trapezia. Camera lenses, Ferris wheels, pizza, rings, wheels, steering wheels, pies, cakes, and buttons are examples of real-life circle applications.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills such as addition, subtraction, multiplication, division, rational/irrational/non-terminating numbers, order of operations and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Technology need these skills.<br>**Key Knowledge**<br>Calculate the area of triangles, rectangles and parallelograms.<br>Calculate the area of a trapezium<br>Calculate the perimeter and area of compound shapes Investigate the area of a circle<br>Calculate the area of a circle and parts of a circle with a calculator<br>Calculate the perimeter and area of compound shapes<br>**Key Vocabulary**<br>Formula, Area, Triangle, Square, Parallelogram, Rhombus, Trapezium/Trapezia, Parallel, Perpendicular, height, Formula,<br>Compound, Component, shapes, Sector, Rectangle, Estimate, Radius, $\pi$, Approximately, Diameter, In terms of, Decimal place, Substitute, Significant figures<br>**Sources:** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | Line symmetry and reflection | **Why This?** This topic provides insights into their uses and applications in real life. Symmetry/Reflection are used in every field of work whether it is art or architecture, in the design of buildings, bridges, and other structures to create a sense of balance, harmony and a sense of aesthetic appeal.<br>Many things in our daily life use reflection/symmetry: roads, architecture, train tracks, seesaws, flowers, steering wheels, even our faces. The wings of most butterflies are identical on both sides, the left and right sides.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills such as involving addition, subtraction, multiplication, division, working on grids/graphs, and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Recognise line symmetry<br>Reflect a shape in a horizontal or vertical line 1 (shapes touching the line)<br>Reflect a shape in a horizontal or vertical line 2 (shapes not touching the line)<br>Reflect a shape in a diagonal line 1 (shapes touching the line) Reflect a shape in a diagonal line 2 (shapes not touching the line)<br><br>**Key Vocabulary**<br>Line symmetry, Regular Polygon, Isosceles, Equilateral, Rhombus etc.<br>Reflect, Congruent, Object, Image, Vertical/Horizontal, Vertex, Perpendicular distance<br><br>**Sources:** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Summer 2 | The Data Handling Cycle | **Why This?** This topic provides insights into their uses and applications in real life.<br>To summarize or describe or compare a list of data using a specific parameter.<br>To describe the central tendency of the data.<br>To help predict and prepare for food consumptions, medical needs, weather, fashion, stock markets, etc.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills such as involving addition, subtraction, multiplication, division, reading/interpreting tables/graphs and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Understand and use the mean, median and mode<br>Choose the most appropriate average<br>Find the mean from an ungrouped frequency table<br>Find the mean from a grouped frequency table<br>Identify outliers<br>Compare distributions using averages and the range<br><br>**Key Vocabulary**<br>Average, Mean, Median, Mode, Modal value, Total, subtotal, Frequency, Represent, Estimate, Midpoint, Outlier, Consistent, **Sources:** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | Measures of Location | **Why This?** This topic provides insights into their uses and applications in real life.<br>To summarize or describe or compare a list of data using a specific parameter.<br>To describe the central tendency of the data.<br>To help predict and prepare for food consumptions, medical needs, weather, fashion, stock markets, etc.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills such as involving addition, subtraction, multiplication, division, reading/interpreting tables/graphs and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br><br>**Key Knowledge**<br>Understand and use the mean, median and mode<br>Choose the most appropriate average<br>Find the mean from an ungrouped frequency table<br>Find the mean from a grouped frequency table<br>Identify outliers<br>Compare distributions using averages and the range<br><br>**Key Vocabulary**<br>Average, Mean, Median, Mode, Modal value, Total, subtotal, Frequency, Represent, Estimate, Midpoint, Outlier, Consistent, **Sources:** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

| Mathematics | | |
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| **Year 9** | **Topic** | **Programme of Study** |
| Autumn 1 | ***Straight Line Graphs*** | Why This? This topic helps to visualise the algebraic content and links to wider mathematical ideas such as solving equations, sequences, direct proportion, reflections and functions. It is the first step in plotting functions and forms the bases of ideas needed that will lead to plotting and using graphs of quadratic and cubic functions.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills learnt in the Year 8 scheme of learning (Working in the Cartesian Plane) and prepares students for the content needed in the GCSE course. The timing of this unit has been carefully sequenced so that it consolidates and builds on the prior knowledge learned in year 8 and covers the content needed as prior knowledge for the GCSE content.<br>Key Knowledge<br>Lines parallel to the axes, $y=x$ and $y=-x$<br>Using tables of values<br>Compare gradients<br>Compare intercepts<br>Understand and use $y=mx+c$<br>**Write an equation in the form $y=mx+c$**<br>Find the equation of a line from a graph<br>Interpret gradient and intercepts of real-life graphs<br>**Model real-life graphs involving inverse proportion**<br>**Explore perpendicular lines**<br>Key Vocabulary Parallel, Horizontal, Vertical. Straight Line, Axis, Equation, Graph, Interception, Linear, Equation, Graph, Straight Line, Function, Gradient, Slope, Steep, Positive, Negative, Intercept, Coordinate, y-intercept, Rearrange, Direct Proportion, Table of Values, Real-life, Inverse Proportion, Curve, Asymptote, Interpret, Perpendicular, Product, Reciprocal, Negative Reciprocal<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Forming and solving equations*** | Why This? This topic allows students to formalise a structure when problem solving by setting up and solving equations in a range of contexts. It allows students to revisit and extend their knowledge of forming and solving linear equations and inequalities, including those relating to other parts of the mathematics curriculum. The students also explore rearranging formulae seeing how this links to solving equations and reinforcing their understanding of the difference between equations, formulae, identities and expressions.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills learnt in the Year 8 scheme of learning (Brackets, equations and inequalities) and prepares students for the content needed in the GCSE course. The timing of this unit has been carefully sequenced so that it consolidates and builds on the prior knowledge learned in year 8 and covers the content needed as prior knowledge for the GCSE content.<br>Key Knowledge<br>Solve one- and two-step equations and inequalities<br>Solve one-and two-step equations and inequalities<br>Solve one- and two-step equations and inequalities with brackets<br>Inequalities with negative numbers<br>Solve equations with unknowns on both sides<br>Solve inequalities with unknowns on both sides<br>Solving equations and inequalities in context<br>Substituting into formulae and equations<br>Rearranging formulae (one-step)<br>Rearrange formulae (two-step)<br>Rearrange complex formulae including brackets and squares<br>Key Vocabulary Equation, Inequality, Greater/less than (or equal), Solution, Unknown, Inverse, Solve, Expand, Satisfy, Reverse, Balance, Coefficient, Check, Substitute, From, Formula, Variable, Subject, Rearrange, Make the subject of, Square/root<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

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| | ***Testing conjectures*** | Why This? This topic allows students to formally experience reasoning within the mathematics scheme of learning to completement the regular reasoning that occurs throughout the scheme of learning as a whole. The topic allows the students to question why the mathematics they are doing works and encourages students to think deeply about reasoning and problem solving.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills learnt in the Year 7 scheme of learning (Prime numbers and proof) and in Year 8 (Brackets, equations and inequalities) and prepares students for the content needed in the GCSE course. The timing of this unit has been carefully sequenced so that it consolidates and builds on the prior knowledge learned in year 8 and covers the content needed as prior knowledge for the GCSE content.<br>Key Knowledge<br>Factors, Multiples and Primes<br>True or False?<br>Always, Sometimes, Never true<br>Show that<br>Conjectures about number<br>Expand a pair of binomials<br>Conjectures with algebra<br>Explore the 100 grid<br>Expand three binomials<br>Key Vocabulary Factor, Multiple, Prime, Common, Odd, Even, Express, Conjecture, True/False, Verify, Counterexample, Demonstrate, Prove, Expand, Factorise, Binomial, Term, Expression, Quadratic, In terms of n, Simplify, Cubic<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Autumn 2 | ***Three Dimensional Shapes*** | **Why This?** This topic allows students to work with 3 dimensional shapes and has strong links to real world applications. 3D representations in 2D are used regularly in design, architecture and construction industries. The work on area and volume relates to later work on pressure and density.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills learnt in the Year 8 scheme of learning (Area of trapezia and circles) and prepares students for the content needed in the GCSE course. The timing of this unit has been carefully sequenced so that it consolidates and builds on the prior knowledge learned in year 8 and covers the content needed as prior knowledge for the GCSE content.<br>**Key Knowledge**<br>Know names of 2-D and 3-D shapes<br>Recognise prisms (including language of edges/vertices)<br>Accurate nets of cuboid and other 3-D shapes<br>Sketch and recognise nets of cuboids and other 3-D shapes<br>Plans and elevations<br>Find area of 2-D shapes<br>Surface area of cubes and cuboids<br>Surface area of triangular prisms<br>Surface area of a cylinder<br>Volume of cubes and cuboids<br>Volume of other 3-D shapes – prisms and cylinders<br>Explore volumes of cones, pyramids and spheres<br>**Key Vocabulary**<br>Dimensions, Cube, Cuboid, Cylinder, Cone, Sphere, Pyramid, Tetrahedron, Face, Edge Vertex, Polygon, Prism, Cross-section, Net, Area, Plan, Front elevation, Side elevation, Perspective, Isometric, Solid, Area, Perpendicular height, Units, Formulae, Compound, Surface area, Circumference, Curved surface area, Width, Length, Constant, Cross-section,<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Constructions & congruency*** | Why This? This is a very practical unit and has links with real world measuring and constructions that are used practically in many industries. There are links with units of measurement, circles, regions and area.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills learnt in the Year 7 scheme of learning (Constructing, measuring and using geometric notation) and the Year 8 scheme of learning (Ratio and scale) and (Angles in parallel lines and polygons) and prepares students for the content needed in the GCSE course. The timing of this unit has been carefully sequenced so that it consolidates and builds on the prior knowledge learned in year 8 and covers the content needed as prior knowledge for the GCSE content.<br>Key Knowledge<br>Draw and measure angles<br>Construct and interpret scale drawings<br>Locus of distance from a straight line/shape<br>Locus equidistant from two points<br>Construct a perpendicular bisector<br>Construct a perpendicular from a point<br>Construct a perpendicular to a point<br>Locus of a distance from two lines<br>Construct an angle bisector<br>Construct triangles from given information<br>Identify congruent figures<br>Explore congruent triangles<br>Identify congruent triangle<br>Key Vocabulary<br>Acute, Obtuse, Reflex, Right-angle, Estimate, Protractor, Scale, Ratio, Multiplier, Conversion, mm/cm/m/km, Locus, Path, Equidistant, Construction lines, Point, Stadium, Vertex, Discorectangle, Arc, Perpendicular, Bisector, Line segment, SSS, SAS, ASA, AAS, Net, Prism, Equilateral, Scalene, Isosceles<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Spring 1 | ***Numbers*** | **Why This?** Students will develop their knowledge of the number system to include rational and real numbers. The topic provides plenty of opportunity to revisit and practice their number skills both with and without a calculator where necessary and also provides opportunity to interleave these skills with other topics in the curriculum.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills learnt in the Year 8 scheme of learning (Multiplying and dividing fractions) and (Standard index form) and prepares students for the content needed in the GCSE course. The timing of this unit has been carefully sequenced so that it consolidates and builds on the prior knowledge learned in year 8 and covers the content needed as prior knowledge for the GCSE content.<br>Key Knowledge<br>Integers, real and rational numbers<br>Understand and use surds<br>Work with directed number<br>Solve problems with integers<br>Solve problems with decimals<br>HCF and LCF<br>Adding and subtracting fractions<br>Multiplying and dividing fractions<br>Solve problems with fractions<br>Numbers in standard form<br>**Key Vocabulary**<br>Integer, Real, Rational, Irrational, Root, Square root, Cube root, Surd, Simplify, Positive, Negative, Directed, Inverse, Square, Cube, Operation, Integer, Quotient, Product, Sum, Difference, Decimal, remainder, Adjust, Compensate, Factor, Multiple, Common Factor/Multiple, Prime, HCF/LCM, Product of primes, Fraction, Numerator, Denominator, Mixed number, Common denominator, Improper fraction, Standard form, Power, Index, Exponent, Million, Billion<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Using percentages*** | **Why This?** Building on their revision of fractions in the last topic, students relate these to fractions and decimals, extending their learning from Year 8. All students will look at "reverse" percentage problems. Both calculator and non-calculator methods are encouraged, with the use of decimal multipliers too.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills learnt in the Year 8 scheme of learning (Fractions and percentages) and prepares students for the content needed in the GCSE course. The timing of this unit has been carefully sequenced so that it consolidates and builds on the prior knowledge learned in year 8 and covers the content needed as prior knowledge for the GCSE content.<br>**Key Knowledge**<br>Use the equivalence of fractions, decimals and percentages<br>Calculate percentage increase and decrease<br>Express a change as a percentage<br>Solve 'reverse' percentage problems<br>Recognise and solve percentage problems (non-calculate)<br>Recognise and solve percentage problems (calculator)<br>**Key Vocabulary**<br>Fraction, decimal, percentage, convert, equivalent, increase, decrease, reduce, multiplier, profit, loss, original, change, bar model, repeated, change, multiplier, depreciate<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Maths and Money*** | Why This? Students practice their number skills in a various financial contexts in this unit. The language of financial mathematics, which has mean real world links is further developed in this unit. Simple ideas of tax and wages are introduced and percentages studied in the last unit are applied in various contexts including simple and compound interest.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills learnt in the Year 8 scheme of learning (Fractions and percentages) and (Multiplicative change) and prepares students for the content needed in the GCSE course. The timing of this unit has been carefully sequenced so that it consolidates and builds on the prior knowledge learned in year 8 and covers the content needed as prior knowledge for the GCSE content.<br>Key Knowledge<br>Solve problems with bills and bank statements<br>Calculate simple interest<br>Calculate compound interest<br>Solve problems with Value Added Tax<br>Calculate wages and taxes<br>Solve problems with Value Added Tax<br>Calculate wages and taxes<br>Solve problems with exchange rates<br>Solve unit pricing problems<br>Key Vocabulary<br>Total, debit, credit, balance, expence, bill, percentage, interest, annual, deposit, principal, rate, compound, interest ,ultiplier, per annum, tax, rate, value added, VAT, income, salary, wage, exemption, overtime, currency, convert, exhange<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Spring 2 | ***Deductions*** | **Why This?** In this unit student revise and extend their knowledge of angle rules and properties of shapes, applying them to increasingly complex problems. The unit also builds on the ideas of the earlier Testing Conjectures unit looking at deduction in a geometric rather than algebraic contexts.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills learnt in the Year 8 scheme of learning (Angles in parallel lines and polygons) and (Multiplicative change) and prepares students for the content needed in the GCSE course. The timing of this unit has been carefully sequenced so that it consolidates and builds on the prior knowledge learned in year 8 and covers the content needed as prior<br>Key Knowledge<br>Angles in parallel lines<br>Solving angles problems (using chains of reasoning)<br>Angles problems with algebra<br>Conjectures with angles<br>Conjectures with shapes<br>Link constructions and geometrical reasoning<br>**Key Vocabulary**<br>Angles at a point, alternate, corresponding, parallel, co-interior, isosceles, interior exterior regular equation polygon sum total conjecture prove justify example counterexample parallelogram rhombus kite diagonal bisect locus equidistant construct perpendicular<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***Rotations and translation*** | Why This? This unit builds on the learning of symmetry and reflection. There are connections with other areas of the mathematics curriculum such as the introduction of column vectors and application of coordinates.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills learnt in the Year 8 scheme of learning (Angles in parallel lines and polygons) and prepares students for the content needed in the GCSE course. The timing of this unit has been carefully sequenced so that it consolidates and builds on the prior knowledge learned in year 8 and covers the content needed<br>Key Knowledge<br>Identify the order of symmetry of a shape<br>Compare and contrast rotational symmetry with line symmetry<br>Rotate a shape about a point<br>Rotate a shape about a point not on a shape<br>Translate a point and shapes by a given vector<br>Compare rotation and reflection of shapes<br>Key Vocabulary<br>Shape rotational symmetry order regular irregular rotational line symmetry order mirror shape rotation direction invariant clockwise object image centre anti-clockwise translate vector horizontal vertical move vertex reflect line single<br>Sources Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | **Pythagoras' theorem** | **Why This?** This unit connects to prior learning of square numbers and square roots and gives a clear geometric application of these values. It is an historically important topic as Pythagoras has cultural significance as a famous and important mathematician and the fact that these studies can be attributed to him makes this topic unique.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills learnt in the Year 7 scheme of learning (Constructing, measuring and using geometric notation) and the Year 8 scheme of learning (Working in the Cartesian plane) and prepares students for the content needed in the GCSE course. The timing of this unit has been carefully sequenced so that it consolidates and builds on the prior knowledge.<br>**Key Knowledge**<br>Square and square roots<br>Identify the hypotenuse on a right-angled triangle<br>Determine whether a triangle is right-angled<br>Calculate the hypotenuse of a right-angled triangle<br>Calculate missing angles in right-angled triangles<br>Use Pythagoras' theorem on coordinate axes<br>Explore proofs of Pythagoras' theorem<br>Use Pythagoras' theorem in 3d shapes<br>**Key Vocabulary**<br>Square square root integer significant figures decimal places hypotenuse right-angled triangle opposite adjacent sum origin quadrant line segment gradient<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Summer 1 | Enlargement and Similarity | **Why This?** This topic provides insights into knowledge of transformations to include enlargement, learning the mathematical meaning of the word similar. Students will experience finding unknown sides in similar shapes and will develop their understanding of angle facts, triangle congruence, similarity and properties of quadrilaterals.<br><br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 8 Line Symmetry and Reflection Topic and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br><br>**Key Knowledge**<br>Recognise enlargement and similarity.<br>Enlarge a shape by a positive integer scale factor.<br>Enlarge a shape by a positive integer scale factor from a point.<br>Enlarge a shape by a positive fractional scale factor.<br>Enlarge a shape by a negative scale factor.<br>Work out missing sides and angles in a pair of given similar shapes.<br>Solve problems with similar triangles.<br>Explore ratio in right-angled triangles.<br>**Key Vocabulary** Similar, ratio, enlargement, scale factor, corresponding, object/image, positive, integer, distance, centre, fraction, orientation, rotation, inverted, adjacent, hypotenuse, angle, right-angled, opposite.<br>**Sources** Bespoke lesson PowerPoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Active Learn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching PowerPoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | Solving ratio and proportion problems | **Why This?** This topic provides insights into solving all types of ratio problems and develops their understanding of links with direct proportion and graphs. They will then develop on this to understand inverse proportion and be able to apply this to real-world contexts.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 8 Ratio and Change Topic and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Solve problems with direct proportion.<br>Direct proportion and conversion graphs.<br>Solve problems with inverse proportion.<br>Graphs of inverse proportion.<br>Solve ration problems given the whole or a part.<br>Solve best buy problems.<br>Solve problems involving ratio and algebra.<br>**Key Vocabulary** Relationship, ratio, multiplier, constant, scale factor, graph, variable, linear, non-linear, gradient, inverse, variable, constant, proportional, product, divide, share, equal parts, unit cost, direct proportion, equivalent.<br>**Sources** Bespoke lesson PowerPoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Active Learn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching PowerPoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | Rates | **Why This?** This topic provides insights into inverse relationships to explore speed, distance and time in detail by exploring graphs and the link between units and compound units. Students will also explore flow problems such as how long it will take to fill and empty tanks of different shapes and rates.<br><br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. Students have no prior knowledge from the maths curriculum of rates of change from Year 8 or prior. This topic prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br><br>**Key Knowledge**<br>Solve speed, distance and time problems without a calculator.<br>Use distance-time graphs.<br>Solve problems with density, mass and volume.<br>Solve flow problems and their graphs.<br>Rates of change and their units.<br>Convert compound units.<br>**Key Vocabulary** Speed, distance, time, per, hour, minutes, rounding, speed, distance time, accuracy, average, gradient, axes, origin, density, mass, volume, units, substitute, rearrange, straight line, curve, prism, volume, flow rate, imperial, metric.<br>**Sources** Bespoke lesson PowerPoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Active Learn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching PowerPoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Summer 2 | Probability | **Why This?** This topic provides insights into calculating probabilities of single and combined events. As well as exploring a variety of diagrams that support probability such as sample space diagrams, Venn diagrams, two-way tables and tree diagrams considering problems both with replacement and without replacement.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 7 and Year 8 Number Statutory Requirements and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Single event probability.<br>Relative frequency – including convergence.<br>Expected outcomes.<br>Independent events.<br>Use tree diagrams.<br>Use tree-diagrams to solve problems without replacement problems.<br>Use diagrams to work out probabilities.<br>**Key Vocabulary** Event, outcome, equally likely, probability, biased, unbiased, fair, experiment, outcome, trial, frequency, relative frequency, expected, affect, product, probability, independent, intersection, Venn diagram, sample space, union, two-way table.<br>**Sources** Bespoke lesson PowerPoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Active Learn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching PowerPoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | Algebraic Representation<br><br>Revision | **Why This?** This topic provides insights into non-linear graphs such as quadratic graphs, reciprocal graphs, and exponential graphs. Students' knowledge of straight-line graphs is extended by looking at inequalities graphically and on number lines, in addition to graphing and solving simultaneous equations.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon skills in the Year 9 Straight Line Graphs Topic and prepares students for the next unit of study. The timing of this unit has been carefully sequenced so that it is delivered before other subject areas such as Science, PE, Geography and Technology need these skills.<br>**Key Knowledge**<br>Draw and interpret quadratic graphs.<br>Interpret graphs, including reciprocal and piecewise.<br>Investigate graphs of simultaneous equations.<br>Represent inequalities.<br>**Key Vocabulary** Quadratic, parabola, curve, vertex, turning point, symmetry, reciprocal, exponential, piecewise, discontinuous, simultaneous, solution, intersection, satisfy, inequality, solution set, test point, included, excluded.<br>**Sources** Bespoke lesson PowerPoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Active Learn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are fully embedded in the Coast and Vale Learning Trust teaching PowerPoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

| Mathematics | | |
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| **Year 10 Foundation** | **Topic** | **Programme of Study** |
| Autumn 1 | *1 Number* | Why This? Calculation is a fundamental life skill. This block revisits and extends KS3 number content, unlocking a significant amount of additional content at KS4. For example, students will be reviewing prime factorisation and associated number content such as HCF and LCM.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The timing of this unit has been carefully sequenced at the beginning of KS4 so that it allows access to further KS4 content – some of it is prerequisite knowledge for upcoming units of work.<br>Key Knowledge<br>Baseline Tests<br>Calculations<br>Decimal Numbers<br>Place Value<br>Factors and Multiples<br>Squares, Cubes and Roots<br>Index Notation<br>Prime Factors<br>Key Vocabulary Addition Subtraction Multiplication Division Tenth Hundredth Thousandth Factor Multiple HCF LCM Square Cube Square root Cube root Indices Product Prime number<br>Sources Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *2 Algebra* | **Why This?** This topic provides insights into the use of formulae, starting with abstract mathematical formulae and progressing to real life problem solving using substitution. Newtons Laws of Motion and engineering formulae are examples of this. It starts towards a deep understanding of algebraic manipulation including simplification, expansion and factorisation.<br>**Why Now?** Substitution into formulae underpins the study of other GCSE subjects such as GCSE PE and particularly GCSE Physics, which is why it is sequenced early in Year 10. This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013.<br>**Key Knowledge**<br>Algebraic expressions<br>Simplifying expressions<br>Substitution<br>Formulae<br>Expanding brackets<br>Factorising<br>Using expressions and formulae<br>**Key Vocabulary** Expression Like terms Simplify Substitute Formula Formulae Expand Factorise<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Autumn 2 | *3 Graphs, Tables and Charts* | **Why This?** This is a life skill, enabling students to interpret real life graphs, tables and charts. Understanding data and representations of data sets enables adults to make informed choices and predictions and to understand the limits of their forecasts.<br>**Why Now?** This block builds on KS3 work on the collection, representation and use of summary statistics to describe data. Some of the content is familiar, both from previous study within and beyond mathematics (including Geography, PE and Science) and from everyday life. The steps have been chosen to balance consolidation of existing knowledge with extending and deepening, particularly in terms of interpretation of results and evaluating and criticising statistical methods and diagrams.<br>**Key Knowledge**<br>Frequency tables<br>Two-way tables<br>Representing data<br>Time series<br>Stem and leaf diagrams<br>Pie charts<br>Scatter graphs<br>Line of best fit<br>**Key Vocabulary**<br>Frequency, Total, Axes, Axis, Stem, Leaf, Angle, Protractor, Correlation, Line of best fit, Median, Mode<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *4 Fractions and percentages* | Why This? Students explore arithmetic with fractions before linking fractions and percentages. Understanding percentages enables adults to make calculations and judgements in the real world. It includes compound interest, bank accounts and VAT.<br>Why Now This block builds on KS3 work on fractions and percentages, highlighting similarities and differences and links to other areas of mathematics including both algebra and geometry. The focus is on reasoning and understanding notation to support the solution of increasing complex problems that include information presented in a variety of forms. The bar model is a key tool used to support representing and solving these problems.<br>Percentages are a life skill and feature heavily in GCSE papers. This block builds on the understanding gained in KS3. Calculator methods are encouraged throughout and are essential for repeated percentage change/growth and decay problems. Use of financial contexts is central to this block, helping students to maintain familiarity with the vocabulary they are unlikely to use outside school.<br>Key Knowledge<br>Working with fractions<br>Operations with fractions<br>Multiplying fractions<br>Dividing fractions<br>Fractions and decimals<br>Fractions and percentages<br>Calculating percentages 1<br>Calculating percentages 2<br>Key Vocabulary<br>Numerator Denominator Mixed number Improper fraction Percentage Increase Decrease Multiplier Simple interest Compound interest VAT<br>Sources Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Spring 1 | *5 Equations, Inequalities and Sequences* | Why This?<br>This topic revisits and extends KS3 algebra content, unlocking a significant amount of additional content at KS4. For example, looking at the difference between equations and inequalities, students will establish the difference between a solution and a solution set. They will also explore how number lines and graphs can be used to represent the solutions to inequalities. It enables students to solve more complex problems with real life applications. By exploring sequences such as those that oscillate, the triangular numbers and Fibonacci sequences, students can make connections and relate them to the real world such as in art, or to the world of finance when looking at compound interest.<br><br>Why Now?<br>Students revisit and extend their knowledge of forming and solving linear equations and inequalities, including those related to different parts of the mathematics curriculum. They also explore rearranging formulae seeing how this links to solving equations and reinforcing their understanding of the difference between equations, formulae, identities and expressions. This topic provides an excellent opportunity to link to other topics in the curriculum such as angles on a straight line/in shapes/parallel lines, probability, area and perimeter.<br><br>Key Knowledge<br>Solving equations 1<br>Solving equations 2<br>Solving equations with brackets<br>Introducing inequalities<br>More inequalities<br>Using formulae<br>Generating sequences<br>Using the nth term.<br><br>Key Vocabulary<br>Equation, inequality, inverse, solve, rearrange, expression, formulae, identity, equation, linear sequence, quadratic sequence, geometric sequence, term, nth term, difference<br><br>Sources<br>Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br><br>Curriculum Assessment tasks<br>Regular exit tickets, end of unit low stakes testing, test corrections, misconceptions followed up in retrieval starters.<br>Personal Development links<br>Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedded in the Coast and Vale Learning Trust teaching powerpoints that are written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *6 Angles* | **Why This?** This topic revisits and extends KS3 angles content, unlocking a significant amount of additional content at KS4. The concept of angles as measures of turn is important to how pupils view angles. Whilst building upon prior learning, it is imperative that discussions relate to real-life examples of angles including their dynamic nature so that pupils have the opportunity to develop a meaningful idea of angles through connecting formal learning with applied domains, such as bearings, and the use of angles in construction and engineering.<br><br>**Why Now?**<br>This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The timing of this unit has been carefully sequenced to allow students the opportunity to recall prior angle facts and develop increasingly complex chains of reasoning. Angles knowledge will extend to identifying links between angles formed by transversals with parallel lines. Students will learn about the use of corresponding, alternate and co-interior angles in parallel lines, to find missing angles or to prove lines are parallel. This can be extended further to allow students to complete geometric proofs with these and other angle facts, as well as interleaving topics such as ratio and using equations.<br><br>**Key Knowledge**<br>Properties of shapes<br>Angles in parallel lines<br>Angles in triangles<br>Interior and exterior angles<br>More exterior and interior angles<br>Geometrical problems<br><br>**Key Vocabulary**<br>Triangle, equilateral, Isosceles, scalene, quadrilateral, parallelogram, kite, trapezium, acute, obtuse, reflex, right angle, parallel, degrees, clockwise, anticlockwise, protractor, interior, exterior, similar<br><br>**Sources**<br>Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br><br>**Curriculum Assessment tasks**<br>Regular exit tickets, **e**nd of unit low stakes testing, test corrections, misconceptions followed up in retrieval starters.<br>**Personal Development links**<br>Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedded in the Coast and Vale Learning Trust teaching powerpoints that are written specifically for this unit. |

# Curriculum Progression

# Mathematics

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| Spring 2 | *7 Averages and Range* | **Why This?**<br>This topic revisits and extends KS3 averages content, unlocking a significant amount of additional content at KS4. For example, using their prior knowledge of averages, students can begin to compare data sets and apply their skills to grouped data. Students will learn that averages are a common tool for summarizing and understanding large sets of data in various aspects of daily life. These skills can be used across other curriculum areas such as in geography, science, psychology when looking at data.<br><br>**Why Now?**<br>This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. Much of the content is familiar, both from previous study within and beyond mathematics (including Geography and Science) and from everyday life. The timing of this unit has been carefully sequenced as students will have met mean, median and mode several times so they can now be considering when each measure is appropriate to use.<br><br>**Key Knowledge**<br>Mean and range<br>Mode, median and range<br>Types of average<br>Estimating the mean<br>Sampling<br><br>**Key Vocabulary**<br>Average, data, population, mode, median, mean, range, compare, frequency, sample, estimate, proportion<br><br>**Sources**<br>Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br><br>**Curriculum Assessment tasks**<br>Regular exit tickets, end of unit low stakes testing, test corrections, misconceptions followed up in retrieval starters.<br><br>**Personal Development links**<br>Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedded in the Coast and Vale Learning Trust teaching powerpoints that are written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *8 Perimeter, area and volume 1* | Why This?<br>This topic revisits and extends KS3 algebra content, unlocking a significant amount of additional content at KS4. Students can begin to apply prior learning to more complex questions. Applications of area and perimeter can be seen in everyday life, such as finding the floor area of the house, the area of the footpath that will surround the ground, fencing the park with a wire, etc.<br><br>Why Now?<br>This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The timing of this unit has been carefully sequenced to allow students to recall skills for finding areas of simple shapes and apply to surface area and volume problems with 3D shapes. There are opportunities for interleaving other topics such as solving equations when finding missing lengths, the use of decimal and fractional measures and the use of ratio.<br><br>Key Knowledge<br>Rectangles, parallelograms, and triangles<br>Trapezia and changing units<br>Area of compound shapes<br>Surface area of 3D solids<br>Volume of prisms<br>More volume and surface area<br><br>Key Vocabulary<br>Perimeter, area, perpendicular, square centimetre, length, width, height, rectangle, triangle, parallelogram, trapezium, compound, face, volume, cubic centimetre, prism<br><br>Sources<br>Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br><br>Curriculum Assessment tasks<br>Regular exit tickets, end of unit low stakes testing, test corrections, misconceptions followed up in retrieval starters.<br><br>Personal Development links<br>Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedded in the Coast and Vale Learning Trust teaching powerpoints that are written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Summer 1 | *9 Graphs* | **Why This?** This topic builds on the Key Stage 3 unit on Straight Line Graphs. Students will work in all four quadrants on the coordinate grid. They will be able to recognise lines parallel to the axis and straight line graphs. This will lead onto identifying different types of graphs. Students will learn how these graphs link to real-life examples for example graphs showing inverse and direct proportion.<br>**Why Now?** This block builds on year and 9 content, where students plotted simple straight line graphs, they now study y=mx+c as the general equation of a straight line, interpreting m and c in abstract and real life contexts, and reducing to this form in simple cases.<br>Students build upon their understanding of speed, distance and time to calculate speed and velocity from a graph.<br>**Key Knowledge**<br>Co-ordinates<br>Linear graphs<br>Gradient<br>y = mx + c<br>Real life graphs<br>Distance time graphs<br>**Key Vocabulary** Parallel, midpoint, line segment, Gradient, coefficient, Linear equation, Distance–time graph, average speed, rate of change graph, velocity–time graph, velocity, Constant rate<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *10 Transformations* | **Why This?** This unit builds upon work from KS3 and also the previous unit, Unit 9 which begins with exploration of the coordinate grid. This unit has many real-life career applications due to the variety of drawings students practice. This unit allows students to develop their visualisation skills.<br>**Why Now?** Building on their study of line and reflection symmetry in KS3, students look at rotational symmetry and rotation followed by translations, described in vector form. They compare the effect of the transformations studied so far, noticing when objects and images are congruent. Students now further develop their knowledge of enlargement and similarity.<br>**Key Knowledge**<br>Translation<br>Reflection<br>Rotation<br>Enlargement<br>Describing enlargement<br>Combining transformations<br>**Key Vocabulary** Column vector, vertex, vertices, transformation, image, maps, Mirror line, Centre of rotation, Scale factor, centre of enlargement, Origin<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Summer 2 | *11 Ratio and Proportion* | **Why This?** Ratio and proportion are topics which draw from many real—life examples. Students learnt how to use proportional relationships to convert recipes for different numbers of people. They are able to recognise proportional relationships and this builds on the work from the graphs topic studied earlier in the term.<br>**Why Now?** Building upon students experience in previous years, here they solve all types of ratio problems and make links with direct proportion, inverse proportion and graphs. This unit highlighting similarities and differences and links to other areas of mathematics including both algebra and geometry. The focus is on reasoning and understanding notation to support the solution of increasingly complex problems that include information presented in a variety of forms. The bar model is a key tool used to support representing and solving these problems.<br>**Key Knowledge**<br>Writing ratio<br>Using ratio 1/2<br>Ratios and measures<br>Comparing using ratios<br>Using proportion<br>Proportion and graphs<br>Proportion problems<br>**Key Vocabulary** Ratio, simplify, equivalent, highest common factor, Simplest form<br>Ratio, unit, Proportion, unit ratio, unitary method, direct proportion, inverse proportion<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *12 Right-Angled Triangles* | **Why This?** This topic builds on previous work on shape in KS3. Students learn about Pythagoras' Theorem and it's real life applications. It also introduces students to a key historical figure. Trigonometry helps students develop their problem solving skills and links to other areas of mathematics. Triangles themselves are inherently interesting due to their use in all aspects of architecture and structure design.<br>**Why Now?** Students build upon their knowledge of squares and square roots to investigate the relationship between the sides of a right-angled triangle leading to the discovery of Pythagoras' Theorem. Trigonometry is introduced as a special case of similarity within right-angled triangles. Emphasis is placed throughout the steps on linking the trig functions to ratios, rather than just functions. This key topic is introduced early in Year 10 to allow regular revisiting e.g. when looking at bearings.<br>**Key Knowledge**<br>Pythagoras Theorem 1/2<br>Trigonometry – sine Ratio 1/2<br>Trigonometry – cosine Ratio<br>Trigonometry – tangent ratio<br>Find missing lengths and angles using trigonometry<br>**Key Vocabulary** Hypotenuse, Surd, Hypotenuse, opposite, adjacent, sin $\vartheta$ $\sin^{-1}$, Cosine, cos $\vartheta$, Tangent, tan $\vartheta$, elevation, depression<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

# Mathematics

| Mathematics | | |
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| **Year 11 Foundation** | **Topic** | **Programme of Study** |
| Autumn 1 | *13 Probability* | Why This? This unit consolidates the content from the KS3 curriculum. Students will learn to solve a variety of problems related to probability. They will learn to use a variety of diagrams to solve these problems, many of which will be based on real-life examples.<br>Why Now This block builds on KS3 and provides a good context in which to revisit fraction arithmetic and conversion between fractions, decimals and percentages. Tables and Venn diagrams are revisited and understanding and use of tree diagrams is developed.<br>Key Knowledge<br>Calculating probability<br>Two events<br>Experimental probability<br>Venn diagrams<br>Tree diagrams<br>Key Vocabulary mutually exclusive, exhaustive, Sample space diagram, Relative frequency, experimental probability, Union, intersection, universal set, Venn diagram Independent, Dependent events<br>Sources Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *14 Multiplicative Reasoning* | **Why This?** This unit builds on work from KS3. Much of this work relates to real-life application of mathematics. Students will learn how to calculate percentages in various contexts, a skill which will be vital in their adult life. They will learn about how to calculate distance, speed and time and be able to apply these to problem solving.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013.<br>**Key Knowledge**<br>Percentages<br>Growth and decay<br>Compound Measures<br>Distance, speed and time<br>Direct and inverse proportion<br>**Key Vocabulary**<br>Percentage change, Compound interest, per annum, annual, salary, half-life<br>Density, pressure, Kinematics formulae, acceleration, initial velocity<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Autumn 2 | *15 Constructions, Loci and bearings* | **Why This?** In this unit of work, students will learn how to accurately construct various shapes and diagrams. This will also include learning about how to calculate volume and surface area of shapes. Students will also learn how to interpret scale diagrams and how to use scales to calculate distances in real life.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013.This builds upon Unit 6 (properties of shape) and unit 11 (ratio and measure).<br>**Key Knowledge**<br>3D solids<br>Plans and elevations<br>Accurate drawing 1<br>Scales and maps<br>Accurate drawing 2<br>Constructions Loci and regions<br>Bearings<br>**Key Vocabulary**<br>Faces, edges, vertices (vertex), dimension, pyramid, right prism, Plane, plane of symmetry, plan, side elevation, front elevation, ASA, SAS, SSS, RHS, hypotenuse, Construct, cyclic quadrilateral, Bisect a line, perpendicular bisector, construction lines, construct, angle bisector, constructions, Equidistant, locus, loci, region, Bearing<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *16 Quadratic equations and graphs* | Why This? Quadratics enable us to model real life actions such as projectiles, launching objects from height, kicking/throwing/shooting/ballistics, accelerating, braking, and calculating areas. They are functions whose values can be calculated from input values and advance upon linear functions to provide a significant move away from attachment to straight lines.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon Unit 2 (Expanding brackets) and Unit 9 (Linear graphs and real life graphs).<br>Key Knowledge<br>Expanding double brackets<br>Plotting quadratic graphs<br>Using quadratic graphs<br>Factoring quadratic expressions<br>Solving quadratic equations algebraically<br>Key Vocabulary<br>line of symmetry, parabola, co-ordinates, roots, difference of two squares<br><br>Sources Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br><br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Spring 1 | *17 Perimeter, Area and volume 2* | **Why This?** This unit of the scheme of learning allows students to calculate lengths and areas associated with circles and compound shapes made from circles. It extends these ideas into common 3D shapes and their volumes. The shapes and solids used in this unit have links with real world objects and can be used to help solve real world problems in contexts such as density, pressure, proportion and capacity.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The timing of this unit has been carefully sequenced at the end of KS4 as it builds from concepts in earlier units. This builds upon Unit 1 (place value) and unit 5 (using formulae and unit 8 rectangles, parallelograms and triangles).<br>**Key Knowledge**<br>Circumference of a circle<br>Area of a circle<br>Semicircles and sectors<br>Composite 2D shapes and cylinders<br>Pyramids and cones<br>Spheres and composite solids<br>**Key Vocabulary**<br>Length, perimeter, area, circumference, radius, diameter, chord, sector, segment, pyramid, cone, sphere, hemisphere, volume, surface area, units of measuremet, compound shape, composite solid, pi, arc length.<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *18 Fractions, Indices and Standard Form* | **Why This?** This unit of the scheme of learning allows students to calculate with fractions and mixed numbers, work with the laws of indices and calculate with standard form. Fractions are an important way to describe proportion and are wildly used in the real world as an application of the knowledge learned in a maths classroom. Indices can be used in calculations of number work and algebra work and describe repeated multiplications. Standard form is a commonly used standard measure using in science and other real-world situations to describe very large and very small values. Calculating in standard form makes calculations with these types of numbers trivial.<br><br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The timing of this unit has been carefully sequenced at the end of KS4 as it builds from concepts in earlier units. This block builds upon knowledge from Unit 2, focusing on understanding powers generally, and in particular in standard form.<br>**Key Knowledge**<br>Multiplying and dividing fractions<br>The laws of indices<br>Writing large numbers in standard form<br>Writing small numbers in standard form<br>Calculating with standard form<br>**Key Vocabulary**<br>Improper fraction, proper fraction, unit fraction, mixed number, reciprocal, power, index number, base number, multiplicand, multiplier, power of ten<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Spring 2 | *19 Congruence, Similarity and Vectors* | **Why This?** This unit of the scheme of learning allows students to understand the properties required for two shapes to be congruent and has links with the previous work on transformations. The topic defines the mathematical definition of similarity and connects this with the work previously done on enlargement and direct proportion. Column vectors allow students to describe a movement and are useful in describing enlargements and translations on a grid.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. This unit builds upon Unit 6 and Unit 10 which cover angles in triangles and describing enlargements. It also includes work on solving equations and angles in parallel lines.<br>**Key Knowledge**<br>Similarity and enlargement<br>Congruence<br>Vectors<br>**Key Vocabulary**<br>Congruency, Similarity, Column Vector, Scalar, Object, Image, direct proportion<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *20 More Algebra* | **Why This?** This unit of the scheme of learning teaches students to apply their algebraic knowledge into visual representations including graphs of functions which can then be used to solve problems. It extends the ideas of linear, quadratic and cubic functions into reciprocal functions. These graphs can then be used to solve equations in two variables when presented as simultaneous equations. This is then formalised into a written algebraic method. Final the topic focuses on rearranging formulae which allows students to work inversely when working with generalised formulae and has many links to the real world where formulae are used in this way.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The timing of this unit has been carefully sequenced at the end of KS4 as it builds on recent knowledge from unit 16 (quadratic graphs) and from unit 11 (proportion problem)s.<br>**Key Knowledge**<br>Graphs of reciprocal functions<br>Non-linear graphs<br>Solving simultaneous equations graphically<br>Solving simultaneous equations algebraically<br>Rearranging formulae<br>**Key Vocabulary**<br>Graph, function, quadratic, linear, cubic, reciprocal, variable, coefficient, simultaneous equations, formulae, subject, rearrange, non-linear<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit.<br>**Personal Development links** |
| Summer 1 | | Revision for GCSE |
| Summer 2 | | **End of the course.** |

# Curriculum Progression

# Mathematics

| Mathematics | | |
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| **Year 10 Higher** | **Topic** | **Programme of Study** |
| Autumn 1 | *1 Number* | Why This? Basic use of number is a fundamental life skill. This block revisits and extends KS3 number content, unlocking a significant amount of additional content at KS4. For example, students will be reviewing prime factorisation and associated number content such as HCF and LCM. They will learn to manipulate surds and recognise a surd as an exact answer to a calculation.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The timing of this unit has been carefully sequenced at the beginning of KS4 so that it allows access to further KS4 content – some of it is prerequisite knowledge for upcoming units of work.<br>Key Knowledge<br>Number problems and reasoning<br>Place value and estimating<br>HCF and LCM<br>Calculating with powers (indices)<br>Zero, fractional and negative powers<br>Powers of 10 and standard form<br>Surds<br>Key Vocabulary Number, addition, subtraction, division, multiplication, reasoning, place value, place holder, highest, common, factor, lowest, multiple, indices, power, index, fractional, negative, standard form, surds, coefficient.<br>Sources Bespoke lesson PowerPoints, White Rose Education, Pearson ActiveLearn, Corbett Maths, Go Teach Maths, Maths Genie, MathsPad, MathsBox, Dr Austin.<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are embedding in the Coast and Vale Learning Trust teaching PowerPoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | ***2 Algebra*** | **Why This?** This topic provides insights into functions, expressions and generalisations. It starts towards a deep understanding of the basic algebraic forms with more complex expressions being dealt with later. It brings together key skills with a visual representation of sequences as seen in the real-world.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. Substitution into formulae underpins the study of other GCSE subjects such as GCSE PE and particularly GCSE Physics, which is why it is sequenced early in Year 10. Additionally, the use of sequences in patterns for more practical design lessons such as design technology and textiles can be used for the creation of patterns in sequence. It builds on work from the previous unit on Indices.<br>**Key Knowledge**<br>Algebraic indices<br>Expanding and factorising<br>Equations<br>Formulae<br>Linear sequences<br>Non-linear sequences<br>More expanding and factorising<br>**Key Vocabulary** indices, index, power, term, expression, expanding, factorising, factor, highest common factor, equation, expression, formulae, formula, linear, non-linear, sequence, geometric, binomial.<br>**Sources** Bespoke lesson PowerPoints, White Rose Education, Pearson ActiveLearn, Corbett Maths, Go Teach Maths, Maths Genie, MathsPad, MathsBox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are embedding in the Coast and Vale Learning Trust teaching PowerPoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Autumn 2 | *3 Interpreting and Representing Data* | **Why This?** This block builds on KS3 work on the collection, representation and use of summary statistics to describe data. Students will see graphs in a variety of professions in real-world contexts. These can be seen in jobs but also on things like the news where students will be able to read and understand the information presented to them.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. Much of the content is familiar, both from previous study within and beyond mathematics (including Geography and Science) and from everyday life. The steps have been chosen to balance consolidation of existing knowledge with extending and deepening, particularly in terms of interpretation of results and evaluating and criticising statistical methods and diagrams.<br>**Key Knowledge**<br>*Statistical diagrams 1*<br>*Time series*<br>*Scatter graphs*<br>*Line of best fit*<br>*Averages and range*<br>*Statistical diagrams 2*<br>**Key Vocabulary** Mean, median, mode, range, time, series, continuous, discrete, scatter, graph, plot, point, line of best fit, quarter, trend, consistent, variable, relationship, linear, positive, negative, correlation, scale, origin, estimate, interpolate, interpolation.<br>**Sources** Bespoke lesson PowerPoints, White Rose Education, Pearson ActiveLearn, Corbett Maths, Go Teach Maths, Maths Genie, MathsPad, MathsBox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are embedding in the Coast and Vale Learning Trust teaching PowerPoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *4 Fractions, Ratios and percentages* | **Why This?** This block builds on KS3 work on ratio and fractions, highlighting similarities and differences and links to other areas of mathematics including both algebra and geometry. The focus is on reasoning and understanding notation to support the solution of increasingly complex problems that include information presented in a variety of forms.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. Percentages feature heavily in real life and GCSE papers and this block builds on the understanding gained in KS3. Calculator methods are encouraged throughout and are essential for repeated percentage change/growth and decay problems. Use of financial contexts is central to this block, helping students to maintain familiarity with the vocabulary they are unlikely to use outside school.<br>**Key Knowledge**<br>Fractions<br>Ratios<br>Ratio and proportion<br>Percentages<br>Fractions, decimals and percentages<br>**Key Vocabulary** Ratio, simplest form, convert, unit, equivalent, share, more than, less than, part, whole, proportion, fraction, compare, direct proportion, gradient, equation, origin, percentage, decimal, represent.<br>**Sources** Bespoke lesson PowerPoints, White Rose Education, Pearson ActiveLearn, Corbett Maths, Go Teach Maths, Maths Genie, MathsPad, MathsBox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are embedding in the Coast and Vale Learning Trust teaching PowerPoints being written specifically for this unit. |

# Curriculum Progression

# Mathematics

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| Spring 1 | *5 Angles and Trigonometry* | **Why This?** Students will also reinforce their understanding of trigonometry and Pythagoras from earlier this year, applying their skills in another context as well as using mathematics to model real-life situations.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. This block provides a great opportunity to revisit other materials and make links across the mathematics curriculum. Accurate drawing and use of scales will be vital, as is the use of parallel line angles rules; all of these have been covered at Key Stage 3. This unit builds on knowledge of surds from unit 1 and formulae from unit 2.<br>**Key Knowledge**<br>Angle properties of triangles and quadrilaterals<br>Interior angles of a polygon<br>Exterior angles of a polygon<br>Pythagoras' theorem 1<br>Pythagoras' theorem 2<br>Trigonometry 1<br>Trigonometry 2<br>**Key Vocabulary** Angle, obtuse, triangle, acute, reflex, equilateral, isosceles, scalene, right-angles, squares, kite, rectangle, parallelogram, rhombus, trapezium, interior, polygon, exterior, Pythagoras, sine, cosine, tangent.<br>**Sources** Bespoke lesson PowerPoints, White Rose Education, Pearson ActiveLearn, Corbett Maths, Go Teach Maths, Maths Genie, MathsPad, MathsBox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real-world applications are embedding in the Coast and Vale Learning Trust teaching PowerPoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *6 Graphs* | **Why This?**<br>This graph unit builds upon work done at KS3 and supports students in identifying different types of graphs and what they show. Graphs are used in various aspects of mathematics, but in the real world they can take on specific meanings. For example an exponential graph can be used to model population growth such as monitoring wildlife conservation projects. The use of different types of graphs can help predict trends and are therefore useful in other subject areas such as science.<br><br>**Why Now?**<br>This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The timing of this unit has been carefully sequenced to allow students to link previous work on direct proportion and rates of change. Students will focus on interpreting information shown from graphs and link prior learning on compound measures to distance time graphs. Students can also begin to link solutions to solving equations with solutions using a graph. It builds on work from unit 2 (Formulae), unit 3 (Scatter Graphs) and unit 5 (Pythagoras).<br><br>**Key Knowledge**<br>Linear graphs<br>More linear graphs<br>Graphing rates of change<br>Real-life graphs<br>Line segments<br>Quadratic graphs<br>Cubic and reciprocal graphs<br>More graphs<br><br>**Key Vocabulary** Linear, equation, intercept, gradient, rate of change, variable, constant, coordinate, axes, segment, quadratic, roots, cubic, reciprocal<br><br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br><br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br><br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

# Mathematics

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| Spring 2 | *7 Area and Volume* | **Why This?**<br>When we teach students about area, surface area, and volume, we are teaching ideas that help them measure the physical world. These skills can be used in other subject areas such as calculating surface area to volume ratio in biology, or quantity of material in design technology<br><br>**Why Now?**<br>This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon and extends skills covered in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The formulae for arc length and sector area are built up from students' understanding of fractions. They are also introduced to the formulae for surface area and volume of spheres and cones; here higher students can enhance their knowledge and skills of working with area and volume ratios. Students can also now go on to explore the total volume of shapes made by combining cylinders, spheres and cones, and also look at parts of the shapes. It builds on Pythagoras from unit 5 and Formulae from unit 2.<br><br>**Key Knowledge**<br>Perimeter and area<br>Units and accuracy<br>Prisms<br>Circles<br>Sectors of circles<br>Cylinders and spheres<br>Pyramids and cones<br><br>**Key Vocabulary** length, width, perpendicular height, perimeter, area ,volume, base, cross section surface area, parallelogram, trapezium, kite, circle, semicircle, sector, Pi, cylinder, cone, pyramid, sphere<br><br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br><br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br><br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *8 Transformations and Constructions* | **Why This?** This block revisits and extends KS3 geometry content, unlocking a significant amount of additional content at KS4.Transformations are all around us. For example, in art, artists might use reflections to create symmetry. In architecture or engineering, rotations and dilations might be used to create scale drawings or models. Students need to be aware of the importance of accuracy in geometric constructions in real-life applications such as engineering and architecture. Students need to comprehend that understanding loci allows prediction of objects in motion in scenarios such as space exploration and nature conservation.<br><br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. The timing of this unit has been carefully sequenced as some of it is prerequisite knowledge for upcoming units of work. Students explore all the transformations and constructions, relating these to symmetry and properties of shapes when appropriate. There is an emphasis on describing as well as performing transformations as using the language promotes deeper thinking and understanding. The reflections unit provides a good opportunity to revisit equations of a straight line. Transformations also provides an opportunity to revisit the names of shapes. Higher tier students can extend their learning to explore the idea of invariance and can go on to look at trigonometric graphs as a vehicle for exploring graph transformations in later units. It builds on angle properties from unit 5.<br><br>**Key Knowledge**<br>3d Solids<br>Reflection and rotation<br>Enlargement<br>Transformations and combinations of different transformations<br>Scale drawing and bearings<br>Constructions 1<br>Constructions 2<br>Loci<br><br>**Key Vocabulary** face, edge, vertices, cross section, reflection, object, image, line of reflection, rotation, clockwise, anticlockwise, centre of rotation, transformation, column vector, enlargement, centre of enlargement, scale factor, bearing, bisector, perpendicular, construct, arc, compass, equidistant, loci<br><br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Summer 1 | *9 Equations and Inequalities* | **Why This?** Students will have covered both equations and inequalities at key stage 3, this unit offers the opportunity to revisit and reinforce standard techniques and deepen their understanding. Looking at the difference between equations and inequalities, students will establish the difference between a solution and a solution set; they will also explore how number lines and graphs can be used to represent the solutions to inequalities. As well as solving equations, emphasis needs to be placed on forming equations from given information. This provides an excellent opportunity to revisit other topics in the curriculum such as angles on a straight line/in shapes/parallel lines, probability, area and perimeter etc. Factorising quadratics to solve equations is covered in the Higher strand here and is revisited in Year 11.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds on equations, expanding and factorising from unit 2 and quadratic graphs which were first studied in unit 6.<br>**Key Knowledge**<br>Solving linear inequalities<br>Solving quadratic equations<br>Completing the square<br>Solving simultaneous equations<br>**Key Vocabulary** solve, solution, solution set, linear, inequality, quadratic, equation, factorise, formula, roots, turning point, simultaneous, intersect, roots, turning point<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *10 Probability* | **Why This?** This unit builds on KS3 and provides a good context in which to revisit fraction arithmetic and conversion between fractions, decimals and percentages. Tables and Venn diagrams are revisited and understanding and use of tree diagrams is developed, with conditional probability being a key focus<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013<br>It builds on knowledge of number problems from unit 1 and knowledge of fractions from unit 4.<br>**Key Knowledge**<br>Combined events<br>Mutually exclusive events<br>Experimental probability<br>**Key Vocabulary** outcome, event, equally likely, independent, dependent, mutually exclusive, Venn diagram, complement, Venn diagram, Intersection, Union, tree diagram<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Summer 2 | *11 Multiplicative reasoning* | **Why This?** Students develop their multiplicative reasoning in a variety of contexts, they revisit speed, pressure and density calculations and move on to compound calculations to test their understanding.<br>Students are encouraged to develop strategies for solving more complex ratio problems often involving an algebraic approach.<br>Students also have a chance to study more complex proportion equations, working in the abstract.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds on percentages, ratio and proportion from unit 4, graphing rates of change from unit 6 and cubic and reciprocal graphs from unit 6.<br>**Key Knowledge**<br>Growth and decay<br>Compound measures<br>Ratio<br>Proportion<br><br>**Key Vocabulary** growth, decay, direct, inverse, proportion, density, mass, volume, pressure, area, speed, distance, time, ratio, compound<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *12 Similarity and congruence* | **Why This?** Building on their experience of enlargement and similarity in previous years, this unit extends students' experiences and looks more formally at dealing with similar triangles. Parallel line angle rules are revisited to support establishment of similarity. Congruency is introduced through considering what information is needed to produce a unique triangle and also establishing that a pair of triangles are congruent through formal proof.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds upon angle properties from unit 5, constructions from unit 8, enlargements from unit 8 and fractions from unit 4.<br>**Key Knowledge**<br>Congruence<br>Proof<br>Similarity<br><br>**Key Vocabulary** similar, congruent, proof, enlarge, scale factor, parallel, corresponding, alternate, area, volume,<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |

# Curriculum Progression

# Mathematics

| Mathematics | | |
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| **Year 11 Higher** | **Topic** | **Programme of Study** |
| Autumn 1 | *13 More Trigonometry* | Why This? Trigonometry is an important branch of mathematics that has practical applications in various fields such as engineering, physics, architecture, and even in everyday tasks like navigation. Learning trigonometry in school helps students develop problem-solving skills, logical reasoning, and critical thinking.<br>Why Now? This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in Unit 5 (Angles and Trigonometry). The timing of this unit has been carefully sequenced towards the end of Year 10 so that it allows access to further KS4 content – some of it is prerequisite knowledge for upcoming units of work.<br>It builds on work from unit 7 (sectors of circles) and unit 8 (reflection and rotation).<br>Key Knowledge<br>Accuracy<br>Graph of the sine function<br>Graph of the cosine function<br>Graph of the tangent function<br>Calculating the areas and the sine rule<br>The cosine rule and 2d trigonometry problems<br>Solving problems in 3d<br>Transforming trigonometric graphs 1<br>Transforming trigonometric graphs 2<br>Key Vocabulary Sine Rule<br>Cosine Rule, Substitute,Rearrange,Equation,Subject of the formula<br>Exact value, Adjacent, Opposite, Included angle<br>Sources Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>Curriculum Assessment tasks: Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>Personal Development links: Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *14 Further Statistics* | **Why This?** Statistics is used to collect, represent and analyse data to test hypothesis. Cumulative frequency graphs (or cumulative frequency diagrams) are useful when representing or analysing the distribution of large, grouped data sets. They can also be used to find estimates for the median value, the lower quartile, and the upper quartile for the data set.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in KS3. It builds on work from unit 3 (Averages, Range and Statistical Diagrams).<br>**Key Knowledge**<br>Sampling<br>Cumulative frequency<br>Box plots<br>Drawing histograms<br>Interpreting histograms<br>Comparing and describing distributions<br>Constructions, loci and bearings - Foundation<br>**Key Vocabulary** Histogram, Frequency Density, Area, Class width, Class interval, Cumulative frequency, Upper bound, Lower quartile, Median, Upper quartile, Outlier, Consistent, Range, Spread, Interquartile range<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |
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# Curriculum Progression

## Mathematics

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| Autumn 2 | *15 Equations and graphs* | **Why This?** Iteration is used to find approximate solutions to equations involving higher powers. Typically, these equations do not factorise easily and so the repeated Mathematical process of Iteration can be used. This has applications in Engineering, Physics and Architecture.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon earlier skills such as solving quadratic equations and rearranging formulae. It uses knowledge of linear and quadratic graphs from unit 6 and solving linear inequalities from unit 9.<br>**Key Knowledge**<br>Representing inequalities graphically<br>Solving simultaneous equations graphically<br>Solving cubic equations graphically<br>Using Iteration to find approximate solutions to equations<br>**Key Vocabulary** Inequality, Solution set, Included, Not included, Rearrange, Subject, Formula, Iteration, Converge, Recurrence, Iterative<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| | *16 Circle Theorems* | **Why This?** We can use circle theorems with prior knowledge of other angle properties to calculate missing angles, without the use of a protractor. This has applications in architecture e.g. when designing decorative features like domes and arches. Engineers also use circle theorems to locate points and determine their separations from satellites.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in KS3. It builds upon knowledge of unit 5 (Angle Properties of triangles and quadrilaterals), unit 7 (sectors of circles) and unit 12 (geometric proof and congruence).<br>**Key Knowledge**<br>Radii and chords<br>Tangents<br>Angles in circles<br>Applying circle theorems<br>**Key Vocabulary** Radius, Tangent, Centre, Semicircle, Diameter, Segment, Chord, Subtend, Arc, Cyclic Quadrilateral, Bisects, Alternate Segment Theorem<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit. |

# Curriculum Progression

## Mathematics

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| Spring 1 | *17 More Algebra* | **Why This?** Students have covered both fractions and solving equations at key stage 3, and this unit offers the opportunity to revisit and reinforce standard techniques and deepen their understanding. Knowledge of surds from year 10 is built upon, as is the concept of algebraic proof which will feature in the next unit, building upon a deeper understanding and enabling students to see maths as a whole rather than separate discrete topics. This is a substantive unit.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013. It builds on knowledge from unit 2 (algebraic indices, expanding and factorising) and unit 9 (solving quadratic equations).<br>**Key Knowledge**<br>Rearranging formulae<br>Algebraic fractions<br>Simplify algebraic fractions<br>More algebraic fractions<br>Proof<br>Surds<br>Solving algebraic fraction equations<br>**Key Vocabulary** solve, numerator, denominator, rationalise, proof, equation, factorise, formula, subject<br>**Sources** Bespoke lesson powerpoints, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths, Maths Genie, Mathspad, Mathsbox, Dr Austin.<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections, misconceptions followed up in Retrieval Starters.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are embedding in the Coast and Vale Learning Trust teaching powerpoints being written specifically for this unit |

# Curriculum Progression

## Mathematics

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| | *18 Vectors and Geometric Proof* | **Why This?** Vectors are important in navigation where the actual velocity of an aeroplane relative to the earth is given by the combined velocities of the wind (which carries the plane along as if it were a glider) together with the velocity which the plane would have in still air. All the vector algebra (adding, subtracting, multiplying) draws upon knowledge of algebra simplification studied at KS3 and in Year 10.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013<br>It builds on knowledge of unit 5 (Pythagoras), unit 8 (Transformations) and unit 4 (Ratio and Proportion).<br>**Key Knowledge**<br>Vectors and vector notation<br>Vector arithmetic<br>More vector arithmetic<br>Parallel vectors and collinear points<br>Solving geometric problems<br>**Key Vocabulary** vector, scalar, position vector, parallel, collinear, displacement, magnitude<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit |

# Curriculum Progression

## Mathematics

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| Spring 2 | *19 Proportion and Graphs* | **Why This?** Working with proportion is a practical life skill. For example, using inverse proportion, deploying more bricklayers on a site would reduce the time to complete the task. There are applications in GCSE Physics – the effect of loading weights on a spring, and applications in civil engineering as torsion is applied to steel and the structure deforms.<br>**Why Now?** This topic is taken from the National Curriculum in England: Mathematics Program of Study for Key Stage 4 Ref: DFE-00496-2014. It builds upon skills in the Mathematics Program of Study for Key Stage 3 Ref: DFE-00179-2013<br>It builds on knowledge from unit 11 (Ratio and Proportion), unit 17 (Rearranging Formulae), Unit 13 (Graphs of sine, cosine and tangent).<br>**Key Knowledge**<br>Direct proportion<br>More direct proportion<br>Inverse proportion<br>Exponential functions<br>Non-linear graphs<br>Translating graphs of functions<br>Reflecting graphs of functions<br>**Key Vocabulary** direct proportion, inverse proportion, exponential, linear, non-linear, transform, refect, translate<br>**Sources** Bespoke lesson powerpoints created collaboratively as a department and across the Trust throughout 2021-2023, White Rose Education, Pearson Activelearn, Corbett Maths, Go Teach Maths<br>**Curriculum Assessment tasks:** Regular Exit Tickets, End of Unit low stakes testing, test corrections and follow up improvement check homework.<br>**Personal Development links:** Careers in mathematics, cultural capital, SMSC opportunities, literacy and real world applications are fully embedded in the Coast and Vale Learning Trust teaching powerpoints written specifically for this unit. |
| Summer 1 | | Revision for GCSE |
| Summer 2 | | **End of the course.** |