

Stage 6 Mathematics Curriculum Sequence

Subject Intent: For every learner to be confident and fluent mathematicians who enjoy and succeed in mathematics, leaving school with a solid foundation of mathematical skills, knowledge and understanding, primed for their chosen fields in the 21<sup>st</sup> century.

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Big idea/Theme	<p><b>Numbers and the number system</b></p> <ul style="list-style-type: none"> <li>Understand and use decimals with up to three decimal places</li> <li>Work with numbers up to ten million</li> <li>Explore the use of negative numbers</li> <li>Develop understanding of factors and multiples</li> <li>Investigate prime numbers</li> </ul>	<p><b>Calculating: Division</b></p> <ul style="list-style-type: none"> <li>Develop written methods of short division for numbers up to four-digits divided by a one-digit number</li> <li>Deal with remainders when carrying out division</li> <li>Solve problems involving the four operations</li> </ul>	<p><b>Investigating properties of shapes</b></p> <ul style="list-style-type: none"> <li>Investigate properties of 2D shapes</li> <li>Investigate angles in polygons</li> <li>Understand and use the vocabulary of circles</li> </ul>	<p><b>Proportional Reasoning</b></p> <ul style="list-style-type: none"> <li>Solve problems involving scaling</li> <li>Explore enlargement</li> <li>Solve problems involving sharing and grouping</li> </ul>	<p><b>Angles</b></p> <ul style="list-style-type: none"> <li>Develop knowledge of angles</li> <li>Apply angle facts to deduce unknown angles</li> </ul>	<p><b>Calculating Space</b></p> <ul style="list-style-type: none"> <li>Explore area</li> <li>Investigate volume</li> <li>Solve problems involving area and volume</li> </ul>
Big Idea/Theme	<p><b>Checking, approximating and estimating:</b></p> <ul style="list-style-type: none"> <li>Explore ways of approximating numbers</li> <li>Explore ways of checking answers</li> </ul>	<p><b>Visualising and Constructing</b></p> <ul style="list-style-type: none"> <li>Construct 2D shapes</li> <li>Investigate 3D shapes</li> <li>Explore nets of 3D shapes</li> </ul>	<p><b>Formulae</b></p> <ul style="list-style-type: none"> <li>Use simple formulae written in words</li> <li>Create simple formulae written in words</li> <li>Work with formulae written algebraically</li> </ul>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>Explore number sequences</li> </ul>	<p><b>Calculating FDP</b></p> <ul style="list-style-type: none"> <li>Calculate with fractions</li> <li>Calculate with decimals</li> <li>Calculate with percentages</li> </ul>	<p><b>Movement</b></p> <ul style="list-style-type: none"> <li>Understand and use Cartesian coordinates</li> <li>Use transformations to move shapes</li> </ul>
Big Idea/Theme	<p><b>Calculating:</b></p> <ul style="list-style-type: none"> <li>Develop mental calculation skills</li> <li>Extend written methods of multiplication</li> <li>Know and use the order of operations</li> </ul>		<p><b>Exploring FDP</b></p> <ul style="list-style-type: none"> <li>Explore the equivalence between fractions</li> <li>Use the equivalence between fractions</li> <li>Explore the equivalence between</li> </ul>	<p><b>Measuring Space</b></p> <ul style="list-style-type: none"> <li>Solve problems involving measurement</li> </ul>	<p><b>Solving Equations</b></p> <ul style="list-style-type: none"> <li>Solve missing number problems</li> <li>Understand and use algebra</li> </ul>	<p><b>Presenting and measuring Data</b></p> <ul style="list-style-type: none"> <li>Construct and interpret pie charts</li> <li>Solve problems involving graphs and charts</li> </ul>



(Assessment)	<ul style="list-style-type: none"> <li>• Analysis of students' written work and verbal responses</li> <li>• Spaced retrieval</li> <li>• Stage and age appropriate exam questions</li> <li>• Strategic questioning</li> <li>• Misconception checks</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis of students' written work and verbal responses</li> <li>• Spaced retrieval</li> <li>• Stage and age appropriate exam questions</li> <li>• Strategic questioning</li> <li>• Misconception checks</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis of students' written work and verbal responses</li> <li>• Spaced retrieval</li> <li>• Stage and age appropriate exam questions</li> <li>• Strategic questioning</li> <li>• Misconception checks</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis of students' written work and verbal responses</li> <li>• Spaced retrieval</li> <li>• Stage and age appropriate exam questions</li> <li>• Strategic questioning</li> <li>• Misconception checks</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis of students' written work and verbal responses</li> <li>• Spaced retrieval</li> <li>• Stage and age appropriate exam questions</li> <li>• Strategic questioning</li> <li>• Misconception checks</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis of students' written work and verbal responses</li> <li>• Spaced retrieval</li> <li>• Stage and age appropriate exam questions</li> <li>• Strategic questioning</li> <li>• Misconception checks</li> </ul>
Links to key stage 2 & 3/ prior knowledge needed	<p><b>Number and the number system</b></p> <ul style="list-style-type: none"> <li>• Understand and use place value in numbers with up to seven digits</li> <li>• Multiply and divide whole numbers by 10, 100, 1000</li> <li>• Multiply and divide numbers with one decimal place by 10, 100, 1000</li> <li>• Know the meaning of 'factor' and 'multiple' and 'prime'</li> </ul> <p><b>Checking, approximating</b></p>	<p><b>Calculating: Division</b></p> <ul style="list-style-type: none"> <li>• Use knowledge of multiplication tables when dividing</li> <li>• Know how to use short division</li> </ul> <p><b>Visualising and constructing</b></p> <ul style="list-style-type: none"> <li>• Know the names of common 2D shapes</li> <li>• Know the names of common 3D shapes</li> <li>• Use a protractor to measure and draw angles</li> </ul>	<p><b>Investigating properties of shapes</b></p> <p>Know the properties of rectangles</p> <p>Know the difference between a regular and an irregular polygon</p> <p>Add and subtract numbers up to three digits</p> <p><b>Formulae</b></p> <p>Know the order of operations</p>	<p><b>Proportional Reasoning</b></p> <ul style="list-style-type: none"> <li>• Recall multiplication facts for multiplication tables up to <math>12 \times 12</math></li> <li>• Recall division facts for multiplication tables up to <math>12 \times 12</math></li> <li>• Find fractions of an amount</li> <li>• Find multiples of a given number</li> </ul> <p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>• Count forwards and backwards in tens (hundreds, thousands) from any positive</li> </ul>	<p><b>Angles</b></p> <ul style="list-style-type: none"> <li>• Know that angles are measured in degrees</li> <li>• Know that angles in a full turn total <math>360^\circ</math>, and angle in half a turn must total <math>180^\circ</math></li> <li>• Estimate the size of angles</li> </ul> <p><b>Calculating FDP</b></p> <ul style="list-style-type: none"> <li>• Convert between mixed numbers and improper fractions</li> <li>• Find equivalent fractions</li> <li>• Add and subtract fractions when one</li> </ul>	<p><b>Calculating space</b></p> <ul style="list-style-type: none"> <li>• Know the meaning of perimeter (area, volume, capacity)</li> <li>• Know that the area of a rectangle is given by the formula <math>\text{area} = \text{length} \times \text{width}</math></li> <li>• Know that area can be measured using square centimetres or square metres, and the abbreviations <math>\text{cm}^2</math> and <math>\text{m}^2</math></li> <li>• Know that volume is measured in cubes</li> </ul> <p><b>Movement</b></p> <ul style="list-style-type: none"> <li>• Use coordinates in the first quadrant</li> </ul>

	<ul style="list-style-type: none"> <li>Approximate any number by rounding to the nearest 10, 100 or 1000, 10000 or 100 000</li> <li>Approximate any number with one or two decimal places by rounding to the nearest whole number</li> <li>Approximate any number with two decimal places by rounding to the one decimal place</li> <li>Estimate addition (subtraction) calculations with up to four digits</li> </ul> <p><b>Calculating</b></p>		<p>Know the fact that area of rectangle = length <math>\times</math> width</p> <p><b>Exploring FDP</b></p> <ul style="list-style-type: none"> <li>Understand the concept of a fraction as a proportion</li> <li>Understand the concept of equivalent fractions</li> <li>Understand the concept of fractions, decimals and percentages being equivalent</li> <li>Know that a percentage means 'out of 100'</li> </ul>	<p>number up to 10 000 (100 000, 1 000 000)</p> <ul style="list-style-type: none"> <li>Count forwards and backwards through zero</li> </ul> <p><b>Measuring space</b></p> <ul style="list-style-type: none"> <li>Convert between adjacent metric units of length, mass and capacity</li> <li>Know rough equivalents between inches and cm, feet and cm, kg and lb, pint and ml</li> <li>Use decimal notation to two decimal places when converting between metric unit</li> </ul>	<p>denominator is a multiple of the other</p> <ul style="list-style-type: none"> <li>Multiply a proper fraction by a whole number</li> <li>Use the formal written method of short multiplication</li> <li>Know the effect of multiplying and dividing by 10 and 100</li> <li>Know percentage equivalents of <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{3}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{2}{5}</math>, <math>\frac{4}{5}</math></li> </ul> <p><b>Solving Equations</b></p> <p>Use symbols to represent variables in a formula</p>	<ul style="list-style-type: none"> <li>Identify a translation</li> <li>Carry out a translation in the first quadrant</li> <li>Identify a reflection</li> <li>Carry out a reflection in the first quadrant using mirror lines parallel to the axes</li> <li>Know the meaning of 'congruent', 'congruence', 'object', 'image'</li> </ul> <p><b>Presenting and measuring Data</b></p> <ul style="list-style-type: none"> <li>Measure and construct angles using a protractor</li> <li>Interpret and construct a simple line graph</li> <li>Approximate a number by rounding to a given number of decimal places</li> </ul>
Skill set development	Problem solving Mathematical reasoning Number sense Quantitative reasoning Communication Spatial sense Independence Teamwork	Problem solving Mathematical reasoning Quantitative reasoning Ability to manipulate Construct logical arguments Communication Representation Independence Teamwork	Problem solving Mathematical reasoning Quantitative reasoning Communication Representation Pattern spotting Independence Teamwork	Problem solving Mathematical reasoning Quantitative reasoning Construct logical arguments Communication Spatial sense Measurement Independence Teamwork	Problem solving Mathematical reasoning Quantitative reasoning Ability to manipulate Communication Independence Teamwork	Problem solving Mathematical reasoning Quantitative reasoning Communication Interpretation Inference Information ordering Independence Teamwork

<p><b>Key Vocabulary</b> (Tier 2/ Tier 3)</p>	<p><b>Number and the number system</b> Place value Digit Negative number (Common) multiple (Common) factor Divisible Prime number, Composite number</p> <p><b>Checking, approximating, and estimating</b></p> <p>Approximate Round Decimal place Check Solution Answer Estimate Order of magnitude Accurate Accuracy</p>	<p><b>Calculating: Division</b></p> <p>Commutative Divide, Division, Divisible Divisor, Dividend, Quotient, Remainder Factor Short division Long division Remainder Operation Estimate</p> <p><b>Visualising and constructing</b></p> <p>Protractor Measure Nearest Construct Sketch Cube, Cuboid, Cylinder, Pyramid, Prism Net Edge, Face, Vertex (Vertices) Visualise</p>	<p><b>Investigating properties of shapes</b></p> <p>Quadrilateral, Square, Rectangle, Parallelogram, (Isosceles) Trapezium, Kite, Rhombus, Delta, Arrowhead Triangle, Scalene, Right-angled, Isosceles, Equilateral Polygon, Regular, Irregular Pentagon, Hexagon, Octagon, Decagon, Dodecagon Circle, Radius, Diameter, Circumference, Centre Parallel Diagonal Angle</p> <p><b>Formulae</b></p> <p>Formula, Formulae Expression Variable Substitute Symbol Mile Kilometre Metric Imperial</p> <p><b>Exploring FDP</b></p>	<p><b>Proportional Reasoning</b></p> <p>Proportion Ratio Quantity Integer Similar (shapes) Enlargement Scale factor Group Share Multiples</p> <p><b>Patterns</b></p> <p>Pattern Sequence Linear Term Ascending Descending</p> <p><b>Measuring space</b></p> <p>Length, distance Mass, weight Volume Capacity Metre, centimetre, millimetre Tonne, kilogram, gram, milligram Litre, millilitre Hour, minute, second Inch, foot, yard Pound, ounce</p>	<p><b>Angles</b></p> <p>Angle Degrees Right angle Acute angle Obtuse angle Reflex angle Protractor Vertically opposite</p> <p><b>Calculating FDP</b></p> <p>Mixed number Equivalent fraction Simplify, cancel Lowest terms Proper fraction, improper fraction, top-heavy fraction, vulgar fraction Numerator, denominator Percent, percentage</p> <p><b>Solving Equations</b></p> <p>Algebra, algebraic, algebraically Symbol Expression Variable Substitute Equation Unknown Enumerate</p>	<p><b>Calculating space</b></p> <p>Perimeter, area, volume, capacity Square, rectangle, parallelogram, triangle Composite rectilinear Polygon Cube, cuboid Millimetre, Centimetre, Metre, Kilometre Square millimetre, square centimetre, square metre, square kilometre Cubic centimetre, centimetre cube Formula, formulae Convert Length, breadth, depth, height, width</p> <p><b>Movement</b></p> <p>2-D Grid Axis, axes, x-axis, y-axis Origin Quadrant (Cartesian) coordinates Point Translation Reflection Transformation Object, Image Congruent, congruence</p>
---------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

			<p>Fraction  Improper fraction, Proper fraction, Vulgar fraction, Top-heavy fraction  Percentage  Decimal  Proportion  Simplify  Equivalent  Lowest terms</p>	Pint, gallon		<p><b>Presenting and measuring Data</b></p> <p>Data  Scale  Axis, axes  Graph  Frequency  Time graph, Time series  Line graph  Pie chart  Sector  Angle  Protractor  Degrees  Maximum, minimum  Average  Mean  Measure  Data  Statistic  Statistics  Approximate  Round</p>
Reading and Oracy	<p>Students need to be able read, speak and think in mathematical language, identifying key concepts and processes of the wordier questions. Teachers will improve students' verbal communication skills, to enable them to show their understanding of mathematics accurately. Common strategies within lessons are:</p> <ul style="list-style-type: none"> <li>- giving students sufficient time to read and process information from wordier questions</li> <li>- asking open questions</li> <li>- expanding and justifying answers</li> <li>- repetition of a correctly modelled sentence, to practice oracy skills</li> <li>- using the correct vocabulary and terms within discussions</li> <li>- referring to definitions and meanings when using tier 2 and 3 mathematical vocabulary</li> <li>- addressing common misconceptions.</li> </ul>					

Numeracy	<p><b>Numbers and the number system</b></p> <p>Addition Multiplication Division Subtraction Decimals Numbers BODMAS Symbols (common in mathematics) Fractions</p> <p><b>Checking, approx. and Estimating</b></p> <p>Addition Multiplication Division Decimals BODMAS Symbols (common in mathematics)</p> <p><b>Calculating</b> Addition Subtraction Multiplication</p>	<p><b>Calculating: Division</b></p> <p>Addition Multiplication Division Subtraction Decimals Numbers BODMAS Symbols (common in mathematics) Fractions</p> <p><b>Visualising and constructing</b></p> <p>Introduction to geometry Net diagrams of 3D shapes Introduction to angles Properties of polygons Shapes, Curved 3D Shapes</p>	<p><b>Investigating properties of shapes</b></p> <p>Properties of polygons Introduction to angles Introduction to geometry</p> <p><b>Formulae</b></p> <p>Introduction to algebra BODMAS Equations Multiplication Division Addition Subtraction</p> <p><b>Exploring FDP</b></p> <p>Fractions Decimals Percentages Numbers</p>	<p><b>Proportional Reasoning</b></p> <p>Proportion Ratio Number Fractions Shapes Multiplication</p> <p><b>Patterns</b></p> <p>Introduction to Algebra Addition Subtraction Division Multiplication</p> <p><b>Measuring space</b></p> <p>Multiplication Division Numbers Systems of measurement</p>	<p><b>Angles</b></p> <p>Introduction to Geometry Introduction to angles</p> <p><b>Calculating FDP</b></p> <p>Multiplication Division Percentages Fractions Decimals Fractions Numbers Addition Subtraction</p> <p><b>Solving Equations</b></p> <p>Introduction to algebra Multiplication Division Addition Subtraction</p>	<p><b>Calculating space</b></p> <p>Calculating Area Area Addition Subtraction Division Multiplication Shapes</p> <p><b>Movement</b></p> <p>Transformations of 2D shapes Multiplication Area Addition Subtraction Division Ratio and proportion</p> <p><b>Presenting and Measuring Data</b></p> <p>Addition Subtraction</p>

	Division BODMAS Symbols (common in mathematics)		Multiplication Division Addition Subtraction Proportion			Division Multiplication Data graphs and Charts Data presenting Real-world maths Statistics types of data Simple statistical analysis
Opportunities						
Careers	<b>Numbers and the number system</b>  Accountancy Market research Analyst Bank Clerk Shop Assistant  <b>Checking, approx. and Estimating</b>  Maths Teacher Shop Assistant Manager Professional sports person Business manager  <b>Calculating</b>  Engineering	<b>Calculating: Division</b>  Calculating engineers Actuary Picker/Packer Warehouse operative Dispatcher at an airport  <b>Visualising and constructing</b>  Research associate in mathematical modelling  Graduate Physicist	<b>Investigating properties of shapes</b>  Carpentry Interior design Maths teacher  <b>Formulae</b>  Accountants Auditors Budget analysts Insurance underwriters Loan officers	<b>Proportional Reasoning</b>  Banking Finance Mortgage brokers Stockbrokers Commercial lenders  <b>Patterns</b>  Quantitative analyst  Data Analyst Research associate in mathematics	<b>Angles</b>  Toolmaker/skilled Machinist Mathematical / computational modelling developer Interior systems installer Carpentry Apprenticeship  <b>Calculating FDP</b>  Rotational support officer  Accounting	<b>Calculating space</b>  Architecture Civil Engineering Interior Decorating Carpet fitter Making and fitting blinds Carpentry Gardeners  <b>Movement</b>  Glaziers Construction and building inspectors Aerospace engineers

	Accountancy Actuary Economist Financial analyst	Mathematical Modeller  Research associate	Science Doctors  <b>Exploring FDP</b>  Health Workers Engineering Scientists Cooking/chefs Farming and mechanics	Renewable energy consultant  <b>Measuring space</b>  Mechanic Warehouse operative Yard operative/forklift	Data Entry Real Estate brokers Hairdressers Associate calibration technician  <b>Solving Equations</b>  Air traffic Controller Dietitian Carpenter Market research analyst Boiler maker Meteorologist	Actuaries Architects  <b>Presenting and Measuring Data</b>  Data Analyst Computer game developer Teaching Operational researcher Data Scientist
SMSC including British Values, Culture and Diversity	<p>The mathematics curriculum helps prepare pupils for life in a modern Britain by developing their personal qualities and social skills with the chance to discuss, argue and challenge other people’s ideas in a safe environment. Everyone is encouraged to express their own personal views on the mathematical topics. Alongside everyone learning how to be accepting of other people’s views, students gain realisation that there is not always one route to an answer but several different ways.</p> <p><b>Spiritual</b> - pupils are encouraged to use their imagination and creativity to break problems down and solve them by thinking out side of the box.</p> <p><b>Moral</b> – pupils look at consequences and what happens if rules are not followed. Will an action to one number apply to all numbers?</p> <p><b>Social</b> – developing personal qualities and social skills. Being able to work with others, show perseverance, being able to ask for help and not being afraid to try something new.</p> <p><b>Cultural</b> – understanding others students’ views and being able to express their own views. Exploring problems from a range of cultures.</p>					

Relationship and Sex Education and Health Education	The mathematics curriculum aims to provide pupils with the knowledge and understanding that will enable them to lead a happy, healthy and successful adult life. All pupils are supported to develop resilience, to know how and when to ask for help, and to know where to access support. This develops their capacity to make sound decisions when facing risks, challenges and complex contexts in their lives. Character traits such as perseverance and self-belief, together with personal attributes such as honesty, integrity, tolerance and kindness, will be actively cultivated and celebrated.
-----------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------