

## Skills and knowledge progression - Maths

National Curriculum Aims and purpose	School aims - skills, attitudes and knowledge that we would like all children to develop on their journey through the school
<p>Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.</p> <p><b>Aims</b> The national curriculum for mathematics aims to ensure that all pupils:</p> <ul style="list-style-type: none"> <li>• become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately</li> <li>• reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language</li> <li>• can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions</li> </ul>	<p>We are passionate about promoting high standards of mathematical understanding. We have an ambitious maths curriculum which equips all our children with the necessary skills in mathematics.</p> <p>By the end of their time in primary school, our children will have a secure understanding of the key concepts of mathematics so they can use and apply their knowledge across the wider curriculum. Our children will have a sense of the size of a number and know where it fits into our number system. They will be able to know by heart key number facts, including number bonds and multiplication tables. Our pupils will have developed the ability to use what they have learnt to calculate efficiently, both mentally and with pencil and paper, drawing on the calculation strategies they have been taught. They will be able to make sense of number problems and recognise the operations needed to solve them.</p> <p>Our children will learn how to explain their methods and reasoning, using correct mathematical terminology and will have strategies for checking them where necessary. They will be able to suggest suitable units for measuring, and make sensible estimates of measurements. Pupils will also be able to explain the numbers in graphs, diagrams, charts and tables and make sense of these types of data.</p> <p>Through our sequential, rigorous, interleaved and progressive maths curriculum, our children will acquire and develop the skills they need to be ready for the next stage of their education and learning journey. These skills will enable the children to become successful, active and positive members of their local community and wider world. We want all of our children to become confident, independent problem solvers across the curriculum and in their life beyond school.</p>
<p><b>Links to Learning in EYFS:</b></p> <p><b>Number</b></p> <ul style="list-style-type: none"> <li>• Have a deep understanding of number to 10, including the composition of each number;</li> <li>• Subitise (recognise quantities without counting) up to 5;</li> <li>• Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.</li> </ul> <p><b>Numerical Patterns</b></p> <ul style="list-style-type: none"> <li>• Verbally count beyond 20, recognising the pattern of the counting system;</li> <li>• Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;</li> <li>• Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.</li> </ul>	<p><b>Experiences for our children:</b></p> <ul style="list-style-type: none"> <li>- Regular cross curricular opportunities to apply mathematical skills and knowledge: <ul style="list-style-type: none"> <li>• history (timelines)</li> <li>• science (tables, bar charts, line graphs, reading thermometers, measuring volume/mass/length)</li> <li>• PE (timing, measuring length)</li> <li>• Geography (reading coordinates)</li> <li>• Music (repeating patterns)</li> <li>• Art (identifying and using shapes)</li> <li>• Computing (using angles in coding, data logging)</li> <li>• DT (measuring length/angles)</li> </ul> </li> <li>- One off projects using mathematical skills and knowledge <ul style="list-style-type: none"> <li>• Year 6 enterprise project</li> <li>• Whole school Titanic project</li> </ul> </li> </ul>

# Whole school end of year expectations for Mathematics

(Further depth of working towards and greater depth are available in our child target sheets)



	RECEPTION	EXPECTED STANDARD YEAR 1	EXPECTED STANDARD YEAR 2	EXPECTED STANDARD YEAR 3	EXPECTED STANDARD YEAR 4	EXPECTED STANDARD YEAR 5	EXPECTED STANDARD YEAR 6
Number and Place Value (and Algebra)	<ul style="list-style-type: none"> <li>Count objects, actions and sounds.</li> <li>Count beyond ten</li> <li>Verbally count beyond 20, recognising the pattern of the counting system.</li> <li>Link the number symbol (numeral) with its cardinal number value.</li> <li>Subitise (recognising quantities without counting) up to 5.</li> <li>Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity</li> <li>Understand the 'one more than/one less than' relationship between consecutive numbers.</li> <li>Have a deep understanding of numbers to 10, including the composition of each number.</li> </ul>	<ul style="list-style-type: none"> <li>Counts to and across 100, forwards and backwards, beginning with 0 or one, or from any given number</li> <li>Counts, reads and writes numbers to 100 in numerals; counts in multiples of twos, fives and tens</li> <li>Given a number, identifies one more and one less</li> </ul>	<ul style="list-style-type: none"> <li>Counts in steps of two, three, and five from 0, and in tens from any number, forward and backward</li> <li>Compares and orders numbers from 0 up to 100</li> <li>Uses &lt; &gt; and = signs correctly</li> <li>Uses place value and number facts to solve problems</li> </ul>	<ul style="list-style-type: none"> <li>Counts from 0 in multiples of four, eight, 50 and 100</li> <li>Can work out if a given number is greater or less than 100 or 1000</li> <li>Recognises the place value of each digit in a three-digit number (hundreds, tens, and units)</li> <li>Solves number problems and practical problems involving these ideas</li> <li>identify, represent and estimate numbers in different contexts.</li> </ul>	<ul style="list-style-type: none"> <li>Counts in multiples of six, seven, nine, 25 and 1,000</li> <li>Counts backwards through zero to include negative numbers</li> <li>Orders and compares numbers beyond 1,000</li> <li>Rounds any number to the nearest 10, 100 or 1,000</li> <li>Count backwards through zero to include negative numbers.</li> <li>find 1000 more or less than a given number</li> <li>read Roman numerals to 100 (I to C) and know that over time the numeral system changed to include the concept of zero and place value.</li> </ul>	<ul style="list-style-type: none"> <li>Reads, writes, orders and compares numbers to at least 1,000,000 and determines the value of each digit</li> <li>Interprets negative numbers in context, counts forwards and backwards with positive and negative whole numbers including through zero</li> <li>count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</li> <li>round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</li> <li>read Roman numerals to 1000 (M) and recognise years written in numerals</li> </ul>	<ul style="list-style-type: none"> <li>Rounds any whole number to a required degree of accuracy</li> <li>Uses negative numbers in context and calculates intervals across zero</li> <li>Know what each digit represents in numbers to 10 000 000.</li> <li>Uses simple formulae</li> <li>generate and describe linear number sequences.</li> <li>express missing number problems algebraically</li> <li>find pairs of numbers that satisfy an equation with two unknowns.</li> <li>enumerate possibilities of combinations of two variables.</li> </ul>
Vocabulary	<ul style="list-style-type: none"> <li>count</li> <li>order/ordinal</li> <li>compare</li> <li>forwards</li> <li>backwards</li> <li>numerals</li> <li>digit</li> <li>one more</li> <li>one less</li> <li>equal to</li> <li>more than</li> <li>less than (fewer)</li> </ul>	<ul style="list-style-type: none"> <li>sort</li> <li>represent</li> <li>multiples</li> <li>partitioning</li> <li>ones</li> <li>tens</li> </ul>	<ul style="list-style-type: none"> <li>count in steps</li> <li>count in multiples</li> <li>place value</li> <li>estimate</li> <li>compare</li> </ul>	<ul style="list-style-type: none"> <li>ascending</li> <li>descending</li> <li>10 or 100 more</li> <li>10 or 100 less</li> <li>hundreds</li> </ul>	<ul style="list-style-type: none"> <li>negative numbers</li> <li>roman numerals</li> <li>1000 more</li> <li>1000 less</li> <li>thousands</li> <li>round</li> </ul>	<ul style="list-style-type: none"> <li>ten thousands</li> <li>one hundred thousands</li> <li>powers of</li> <li>integer</li> </ul>	<ul style="list-style-type: none"> <li>millions</li> <li>ten millions</li> </ul>

Addition and Subtraction	<ul style="list-style-type: none"> <li>Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.</li> </ul>	<ul style="list-style-type: none"> <li>Read, write and understand calculations with +, - and = signs.</li> <li>Add and subtract one-digit numbers to 20.</li> <li>Show and use subtraction facts within 20.</li> <li>Add and subtract two-digit numbers to 20.</li> <li>Show and use number bonds to 20.</li> <li>Solve one step problems using addition and subtraction</li> </ul>	<ul style="list-style-type: none"> <li>Solves problems with addition and subtraction by: <ul style="list-style-type: none"> <li>1. using concrete objects and pictorial representations, including those involving numbers, quantities and measures; and</li> <li>2. applying an increasing knowledge of mental and written methods.</li> </ul> </li> <li>Recalls and uses addition and subtraction facts to 20 and 100</li> <li>recognise and use the inverse relationship between addition and subtraction</li> </ul>	<ul style="list-style-type: none"> <li>Adds and subtracts numbers mentally including: <ul style="list-style-type: none"> <li>a three-digit number and ones/units;</li> <li>a three-digit number and tens;</li> <li>and a three-digit number and hundreds</li> </ul> </li> <li>solve addition and subtraction problems.</li> <li>estimate the answer to a calculation and use inverse operations to check</li> <li>solve missing number problems.</li> </ul>	<ul style="list-style-type: none"> <li>Solves addition and subtraction two-step problems in context, deciding which operations and methods to use and which methods</li> <li>use inverse operations to check answers to a calculation.</li> <li>add and subtract numbers with up to 4 digits using efficient methods.</li> </ul>	<ul style="list-style-type: none"> <li>Adds and subtracts whole numbers with more than four digits, including using formal written methods (column addition and subtraction)</li> <li>Calculate mentally with increasingly large numbers (e.g. <math>12,462 - 2,300 = 10,162</math>)</li> <li>Add and subtract mentally using increasingly large numbers</li> <li>use addition and subtraction to solve multi-step problems</li> </ul>	<ul style="list-style-type: none"> <li>Solves addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</li> <li>Uses estimation to check answers to calculations and determines, in the context of a problem, an appropriate degree of accuracy</li> </ul>
Vocabulary	<ul style="list-style-type: none"> <li>add</li> <li>plus</li> <li>altogether</li> <li>total</li> <li>take away /minus</li> <li>number bonds</li> <li>part</li> <li>whole</li> <li>digit</li> </ul>	<ul style="list-style-type: none"> <li>addition/add</li> <li>subtraction</li> <li>difference</li> <li>equals</li> <li>facts</li> <li>problems</li> <li>missing number problems</li> <li>2-digit number</li> <li>inverse</li> </ul>	<ul style="list-style-type: none"> <li>sum</li> <li>3-digit number</li> <li>commutative</li> </ul>	<ul style="list-style-type: none"> <li>column addition</li> <li>column subtraction</li> <li>exchange</li> <li>estimate</li> </ul>	<ul style="list-style-type: none"> <li>4-digit number</li> <li>operations</li> <li>methods</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
Multiplication and Division	<ul style="list-style-type: none"> <li>Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.</li> </ul>	<ul style="list-style-type: none"> <li>share and group small amounts</li> <li>double single digit numbers.</li> <li>use arrays and multiples.</li> <li>solve one-step multiplication and division problems</li> </ul>	<ul style="list-style-type: none"> <li>Recalls and uses multiplication and division facts for the two, five and 10 multiplication tables, including recognising odd and even numbers</li> <li>Solves problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts</li> </ul>	<ul style="list-style-type: none"> <li>Recalls and uses multiplication and division facts for the multiplication tables: <ul style="list-style-type: none"> <li>three;</li> <li>four; and</li> <li>eight.</li> </ul> </li> <li>Writes and calculates mathematical statements for multiplication and division using the multiplication tables that are known including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods</li> <li>solve multiplication and division problems.</li> </ul>	<ul style="list-style-type: none"> <li>Recalls multiplication and division facts for multiplication tables up to <math>12 \times 12</math></li> <li>multiply two-digit and three-digit numbers by a one-digit number using formal written layout</li> <li>use place value and known derived facts to multiply and divide mentally.</li> </ul>	<ul style="list-style-type: none"> <li>Identifies multiples and factors including finding all factor pairs of a number and common factors of two numbers</li> <li>Solves problems involving multiplication and division including using a knowledge of factors and multiples, squares and cubes</li> <li>Solves problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</li> <li>know and use the vocabulary of prime numbers, prime factors and composite.</li> <li>Multiply and divide numbers up to 4 digits by a one or two-digit number.</li> <li>multiply and divide numbers mentally.</li> </ul>	<ul style="list-style-type: none"> <li>Multiplies multi-digit numbers up to four digits by a two-digit whole number using the formal written method of long multiplication</li> <li>Divides numbers up to four digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context</li> <li>use the knowledge of the order of operations to carry out calculations involving the 4 operations.</li> <li>identify common factors, common multiples and prime numbers.</li> <li>interpret remainders as whole number remainders, fractions or rounding</li> </ul>

	<ul style="list-style-type: none"> <li>double</li> <li>half</li> <li>twice as many</li> <li>equal</li> <li>unequal</li> <li>share</li> <li>group</li> <li>odd</li> <li>even</li> </ul>	<ul style="list-style-type: none"> <li>multiplication</li> <li>division</li> <li>arrays</li> </ul>	<ul style="list-style-type: none"> <li>multiplication tables</li> <li>commutative</li> <li>repeated addition</li> </ul>	<ul style="list-style-type: none"> <li>exchange</li> <li>mathematical statements</li> <li>missing number problems</li> <li>integer scaling problems</li> <li>correspondence problems</li> <li>derived facts</li> </ul>	<ul style="list-style-type: none"> <li>factor pairs</li> <li>formal written layout</li> <li>distributive law</li> <li>remainders</li> </ul>	<ul style="list-style-type: none"> <li>multiples</li> <li>factors</li> <li>prime numbers</li> <li>square numbers</li> <li>cube numbers</li> <li>short division</li> <li>product</li> <li>dividend</li> <li>divisor</li> <li>quotient</li> <li>operations</li> </ul>	<ul style="list-style-type: none"> <li>multi-digit numbers</li> <li>long division</li> </ul>
Measurements	<ul style="list-style-type: none"> <li>Compare length, weight and capacity.</li> </ul>	<ul style="list-style-type: none"> <li>know and use words relating to days.</li> <li>sequence events in order.</li> <li>know the value of different coins and notes.</li> <li>know how to use words relating to dates such as weeks and months.</li> <li>measure and record lengths, heights and mass/weight.</li> <li>measure and record capacity and volume.</li> <li>measure and record time.</li> <li>tell the time to the hour and half past hour.</li> <li>tell the time to the hour and half past hour.</li> </ul>	<ul style="list-style-type: none"> <li>Solves simple problems in a practical context involving addition and subtraction of money of the same unit including giving change</li> <li>compare and order lengths, mass, volume/capacity.</li> <li>recognise and use symbols for pound (£) and pence (p).</li> <li>compare and sequence intervals of time</li> </ul>	<ul style="list-style-type: none"> <li>Measures, compares, adds and subtracts lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)</li> <li>Adds and subtracts amounts of money to give change, using both £ and p in practical contexts</li> <li>Tells and writes the time from an analogue clock and 12-hour and 24-hour clocks</li> <li>estimate and read time and compare times using appropriate vocabulary.</li> <li>Identifies right angles, recognises that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identifies whether angles are greater than or less than a right angle</li> <li>Tell the time using Roman numerals from I to XII</li> <li>measure the perimeter of simple 2-D shapes</li> </ul>	<ul style="list-style-type: none"> <li>Converts between different units of measure e.g. kilometre to metre; hour to minute</li> <li>find the area of rectilinear shapes by counting squares.</li> <li>measure and calculate the perimeter of a rectilinear shape in cm and m</li> <li>estimate, compare and calculate different measure, including money in pounds and pence.</li> <li>read, write and convert time between analogue and digital 12—and 24—hour clocks.</li> <li>solve problems involving converting from: hours to minutes; minutes to seconds; years to months; weeks to days.</li> </ul>	<ul style="list-style-type: none"> <li>Converts between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)</li> <li>Measures and calculates the perimeter of composite rectilinear shapes in centimetres and metres</li> <li>Calculates and compares the area of rectangles (including squares), and including using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>)</li> <li>Understand and use approximate equivalences between metric units and imperial units such as inches &amp; pounds</li> <li>estimate the volume and capacity.</li> <li>use all four operations to solve problems involving measure using decimal notation, including scaling.</li> </ul>	<ul style="list-style-type: none"> <li>Uses, reads, writes and converts between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places</li> <li>recognise when it is possible to use formulae for area and volume of shapes.</li> <li>calculate the area of parallelograms and triangles</li> <li>recognise that shapes with the same areas can have different perimeters and vice-versa.</li> <li>calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres(cm<sup>3</sup>) and cubic metres (m<sup>3</sup>), and extending to other units e.g. mm<sup>3</sup> and km<sup>3</sup></li> </ul>
Vocabulary	<ul style="list-style-type: none"> <li>measure</li> <li>wide(er)</li> <li>narrow(er)</li> <li>compare</li> <li>long(er)(est)</li> <li>short(er)(est)</li> <li>length</li> </ul>	<ul style="list-style-type: none"> <li>compare</li> </ul>	<ul style="list-style-type: none"> <li>standard units</li> <li>estimate</li> <li>order</li> <li>record results</li> <li>centimetre cm</li> <li>metre m</li> </ul>	<ul style="list-style-type: none"> <li>millimetre mm</li> <li>perimeter</li> <li>0</li> </ul>	<ul style="list-style-type: none"> <li>kilometres km</li> <li>rectilinear figure</li> <li>area</li> </ul>	<ul style="list-style-type: none"> <li>decimal notation</li> <li>scaling</li> <li>metric units</li> <li>imperial units</li> <li>inches</li> <li>compound shape</li> <li>irregular shapes</li> <li>square centimetres</li> <li>square metres</li> </ul>	<ul style="list-style-type: none"> <li>conversion</li> <li>miles</li> <li>formulae</li> <li>parallelograms</li> <li>triangles</li> <li>feet</li> </ul>
	<b>Measure (height, weight and capacity)</b>						
Vocabulary	<ul style="list-style-type: none"> <li>height</li> <li>long(er)/short(er)</li> <li>tall(er)/short(er)</li> <li>weight</li> <li>capacity</li> <li>heavy/light</li> <li>heavier than</li> <li>lighter than</li> </ul>	<ul style="list-style-type: none"> <li>mass</li> <li>volume</li> </ul>	<ul style="list-style-type: none"> <li>kilogram kg</li> <li>gram g</li> <li>quarter full</li> <li>three quarters full</li> <li>litres l</li> <li>millilitres ml</li> <li>temperature</li> <li>Celsius</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>cubic centimetre</li> <li>pounds</li> <li>pints</li> </ul>	<ul style="list-style-type: none"> <li>cubic metre</li> <li>cubic millimetre</li> <li>cubic kilometre</li> <li>gallons</li> <li>stones</li> <li>ounces</li> </ul>



	<ul style="list-style-type: none"> <li>big/bigger/biggest</li> <li>full/empty</li> <li>more than</li> <li>less than</li> <li>half/half full</li> </ul>						
<b>Time</b>							
<b>Vocabulary</b>	<ul style="list-style-type: none"> <li>time</li> <li>quicker</li> <li>slower</li> <li>earlier</li> <li>later</li> <li>before</li> <li>after</li> <li>first</li> <li>next</li> <li>today</li> <li>yesterday</li> <li>tomorrow</li> <li>morning</li> <li>afternoon</li> <li>evening</li> <li>day</li> <li>week</li> <li>hour</li> <li>minutes</li> </ul>	<ul style="list-style-type: none"> <li>chronological order</li> <li>days of the week</li> <li>months of the year</li> <li>month</li> <li>year</li> <li>o'clock</li> <li>half past</li> <li>second</li> </ul>	<ul style="list-style-type: none"> <li>intervals of time</li> <li>quarter past/to</li> <li>duration</li> </ul>	<ul style="list-style-type: none"> <li>analogue clock</li> <li>roman numerals</li> <li>12-hour clock</li> <li>24-hour clock</li> <li>a.m./p.m.</li> <li>noon</li> <li>midnight</li> <li>leap year</li> <li>digital</li> </ul>	<ul style="list-style-type: none"> <li>convert</li> </ul>		
<b>Money</b>							
<b>Vocabulary</b>		<ul style="list-style-type: none"> <li>money</li> <li>coins</li> <li>notes</li> <li>pounds £</li> <li>pence p</li> </ul>	<ul style="list-style-type: none"> <li>value</li> <li>change</li> </ul>				
<b>Fractions (Decimals and Percentages)</b>		<ul style="list-style-type: none"> <li>recognise, find and name half of an object, shape and amount.</li> <li>recognise, find and name a quarter of an object, shape and amount.</li> </ul>	<ul style="list-style-type: none"> <li>Recognises, finds, names and writes fractions <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math>, <math>\frac{2}{4}</math>, and <math>\frac{3}{4}</math> of a length, shape, set of objects or quantity</li> <li>write simple fractions and recognise equivalence.</li> </ul>	<ul style="list-style-type: none"> <li>Counts up and down in tenths; recognises that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10</li> <li>Recognises, finds and writes fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators</li> <li>Recognises and shows, using diagrams, equivalent fractions with small denominators</li> <li>compare and order fractions, and fractions with the same denominator.</li> </ul>	<ul style="list-style-type: none"> <li>Recognises and shows, using diagrams, families of common equivalent fractions</li> <li>Counts up and down in hundredths; recognises that hundredths arise when dividing an object by 100 and dividing tenths by 10</li> <li>Rounds decimals with one decimal place to the nearest whole number</li> <li>Solves simple measure and money problems involving fractions and decimals to two decimal places</li> <li>recognise and write decimal equivalents to <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, and <math>\frac{3}{4}</math>.</li> <li>recognise and write decimal equivalents of any number of tenths or hundredths</li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders fractions whose denominators are all multiples of the same number</li> <li>Reads and writes decimal numbers as fractions e.g. <math>0.71 = \frac{71}{100}</math></li> <li>Reads, writes, orders and compares numbers with up to three decimal places</li> <li>Solves problems which require knowing percentage and decimal equivalents of <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{2}{5}</math>, <math>\frac{4}{5}</math> and those fractions with a denominator of a multiple of 10 or 25</li> <li>recognise and use 1000ths and relate them to 10ths,</li> </ul>	<ul style="list-style-type: none"> <li>Uses written division methods in cases where the answer has up to two decimal places</li> <li>Solves problems which require answers to be rounded to specified degrees of accuracy</li> <li>Recalls and uses equivalences between simple fractions, decimals and percentages, including in different contexts</li> <li>Compare and order fractions, including fractions <math>&gt;1</math></li> <li>+ and—fractions with different denominators and mixed numbers, using the concept of equivalent fractions.</li> </ul>

				<ul style="list-style-type: none"> <li>recognise and show, using diagrams, equivalent fractions.</li> </ul>	<ul style="list-style-type: none"> <li>add and subtract fractions with the same denominator.</li> </ul>	<ul style="list-style-type: none"> <li>100ths and decimal equivalents.</li> <li>round decimals with 2 decimal places to the nearest whole number &amp; to 1one decimal place.</li> <li>read and order numbers with 3 decimal places.</li> <li>write % as a fraction</li> </ul>	<ul style="list-style-type: none"> <li>multiply simple pairs of proper fractions, writing the answer in its simplest form.</li> <li>divide proper fractions by whole numbers.</li> </ul>
Vocabulary	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>whole</li> <li>half</li> <li>quarter</li> <li>equal parts</li> </ul>	<ul style="list-style-type: none"> <li>three quarters</li> <li>third</li> <li>equivalent fractions</li> <li>unit fractions</li> <li>non unit fractions</li> <li>numerator</li> <li>denominator</li> <li>one whole</li> </ul>	<ul style="list-style-type: none"> <li>tenths</li> </ul>	<ul style="list-style-type: none"> <li>decimal equivalence</li> <li>hundredths</li> <li>convert</li> <li>proper fractions</li> <li>improper fractions</li> <li>decimal point</li> </ul>	<ul style="list-style-type: none"> <li>fifth</li> <li>thousandths</li> <li>mixed numbers</li> <li>per cent %</li> <li>factors</li> <li>integer</li> <li>complements</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
Geometry	<ul style="list-style-type: none"> <li>Select, rotate and manipulate shapes in order to develop spatial reasoning skills.</li> <li>Compose and decompose shapes so that children can recognise a shape can have other shapes within it, just as numbers can.</li> <li>Draw information from a simple map</li> <li>Continue, copy and create repeating patterns.</li> </ul>	<ul style="list-style-type: none"> <li>recognise and name 2-D and 3-D shapes.</li> <li>Describe movement, position and direction.</li> </ul>	<ul style="list-style-type: none"> <li>Compares and sorts common 2-D and 3D shapes and everyday objects</li> <li>Uses mathematical vocabulary to describe position, direction and movement including movement in a straight line, and distinguishes between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)</li> </ul>	<ul style="list-style-type: none"> <li>Draws 2-D shapes and makes 3-D shapes using modelling materials; recognises 3-D shapes in different orientations and describe them</li> <li>Identifies horizontal and vertical lines and pairs of perpendicular and parallel lines</li> <li>recognise that two right angles make a half-turn. 3 make 3/4 of a turn and 4 make a complete turn.</li> <li>identify whether angles are greater than or less than a right angle.</li> </ul>	<ul style="list-style-type: none"> <li>Compares and classifies geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</li> <li>Identifies lines of symmetry in two dimensional shapes presented in different orientations</li> <li>Plots specified points and draws sides to complete a given polygon</li> <li>describe movements between positions as translations of a given unit to the left/right and up/down.</li> <li>identify acute and obtuse angles and compare and order up to two right angles by size.</li> </ul>	<ul style="list-style-type: none"> <li>Draws given angles and measures them in degrees (0)</li> <li>Distinguishes between regular and irregular polygons based on reasoning about equal sides and angles</li> <li>Identify, describe and represent the position of a shape following a reflection or translation.</li> <li>use the properties of rectangles to deduce related facts and find missing lengths and angles.</li> <li>identify angles at a point and one whole turn.</li> </ul>	<ul style="list-style-type: none"> <li>Compares and classifies geometric shapes based on their properties and sizes and finds unknown angles in any triangles, quadrilaterals and regular polygons</li> <li>Draws and translates simple shapes on the coordinate plane and reflects them in the axes</li> <li>Interprets pie charts and line graphs and uses these to solve problems</li> <li>recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</li> </ul>
Vocabulary	<ul style="list-style-type: none"> <li>2-d shapes</li> <li>rectangle</li> <li>square</li> <li>circle</li> <li>triangle</li> <li>characteristics</li> <li>3-d shapes</li> <li>cuboids</li> <li>cubes</li> <li>cone</li> <li>spheres</li> <li>curved</li> <li>straight</li> <li>flat</li> </ul>	<ul style="list-style-type: none"> <li>sides</li> <li>corners</li> <li>properties</li> <li>pyramids</li> <li>faces</li> </ul>	<ul style="list-style-type: none"> <li>pentagon</li> <li>hexagon</li> <li>line of symmetry</li> <li>properties</li> <li>cylinder</li> <li>edges</li> <li>vertices</li> <li>vertex</li> </ul>	<ul style="list-style-type: none"> <li>right-angle triangle</li> <li>heptagon</li> <li>octagon</li> <li>polygon</li> <li>properties</li> <li>prism</li> </ul>	<ul style="list-style-type: none"> <li>isosceles</li> <li>equilateral</li> <li>scalene</li> <li>trapezium</li> <li>rhombus</li> <li>parallelogram</li> <li>kite</li> <li>geometric shapes</li> <li>quadrilaterals</li> </ul>	<ul style="list-style-type: none"> <li>regular polygon</li> <li>irregular polygon</li> </ul>	<ul style="list-style-type: none"> <li>radius</li> <li>diameter</li> <li>circumference</li> <li>dimensions</li> </ul>
	<b>Geometry - properties of a shape</b>						
Vocabulary	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>orientations</li> <li>angles</li> <li>acute angle</li> <li>obtuse angle</li> <li>turn</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>reflex angles</li> <li>degrees</li> <li>one whole turn</li> <li>angles on straight line</li> <li>angles around a point</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

				<ul style="list-style-type: none"> <li>• right angles</li> <li>• half turn</li> <li>• three quarters of a turn</li> <li>• greater than right angle</li> <li>• less than right angle</li> <li>• horizontal lines</li> <li>• vertical lines</li> <li>• perpendicular lines</li> <li>• parallel lines</li> </ul>		<ul style="list-style-type: none"> <li>• vertically opposite</li> <li>• missing angles</li> </ul>	
	<b>Geometry - position and direction</b>						
<b>Vocabulary</b>	<ul style="list-style-type: none"> <li>• over</li> <li>• under</li> <li>• between</li> <li>• around</li> <li>• through</li> <li>• on</li> <li>• into</li> <li>• next to</li> <li>• behind</li> <li>• beneath</li> <li>• order</li> <li>• repeat</li> <li>• patterns</li> <li>• on top of</li> </ul>	<ul style="list-style-type: none"> <li>• position</li> <li>• direction</li> <li>• movement</li> <li>• whole turn</li> <li>• quarter turn</li> <li>• half turn</li> <li>• three-quarter turn</li> </ul>	<ul style="list-style-type: none"> <li>• clockwise/anti-clockwise</li> <li>• straight line</li> <li>• rotation</li> <li>• arrange</li> <li>• sequences</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• co-ordinates</li> <li>• first quadrant</li> <li>• grid</li> <li>• translation</li> <li>• plot</li> <li>• polygon</li> <li>• axis</li> </ul>	<ul style="list-style-type: none"> <li>• reflection</li> </ul>	<ul style="list-style-type: none"> <li>• four quadrants</li> <li>• co-ordinate plane</li> </ul>
<b>Statistics</b>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Asks and answers questions about totalling and comparing categorical data</li> </ul>	<ul style="list-style-type: none"> <li>• Interprets and presents data using bar charts, pictograms and tables</li> <li>• Solve one and two-step problems using presented data</li> </ul>	<ul style="list-style-type: none"> <li>• Solves comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs</li> <li>• interpret and present data using bar charts and time graphs</li> </ul>	<ul style="list-style-type: none"> <li>• Completes, reads and interprets information in tables, including timetables</li> <li>• complete, read and interpret information in tables Including timetables</li> <li>• solve difference, comparison and sum problems using information presented in a line graph.</li> </ul>	<ul style="list-style-type: none"> <li>• Calculates and interprets the mean as an average</li> <li>• Construct and interpret line graphs and pie charts</li> </ul>
<b>Vocabulary</b>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• pictograms</li> <li>• tally chart</li> <li>• block diagram</li> <li>• category</li> <li>• sorting</li> <li>• totalling</li> <li>• comparing</li> <li>• horizontal</li> <li>• vertical</li> </ul>	<ul style="list-style-type: none"> <li>• table</li> <li>• bar chart</li> <li>• one-step problem</li> <li>• two-step problem</li> </ul>	<ul style="list-style-type: none"> <li>• time graph</li> <li>• discrete data</li> <li>• continuous data</li> <li>• line graph</li> <li>• comparison problem</li> <li>• sum problem</li> <li>• difference problem</li> <li>• calculate</li> <li>• interpret</li> </ul>	<ul style="list-style-type: none"> <li>• timetable</li> <li>• two-way tables</li> </ul>	<ul style="list-style-type: none"> <li>• pie chart</li> <li>• mean</li> </ul>
<b>Ratio and Proportion</b>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Solves problems involving the calculation of percentages e.g. of measures and calculations such as 15 per cent of 360, and the use of percentages for comparison</li> <li>• Solves problems involving unequal sharing and grouping using knowledge of fractions and multiples</li> <li>• solve problems involving similar shapes where the scale factor is known or can be found.</li> </ul>

							<ul style="list-style-type: none"> <li>• relative size</li> <li>• missing values</li> <li>• integer multiplication</li> <li>• percentages</li> <li>• scale factor</li> <li>• unequal sharing &amp; grouping</li> </ul>
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### End of Year Expectations Fluency, Problem Solving and Reasoning

	EXPECTED STANDARD YEAR 1	EXPECTED STANDARD YEAR 2	EXPECTED STANDARD YEAR 3	EXPECTED STANDARD YEAR 4	EXPECTED STANDARD YEAR 5	EXPECTED STANDARD YEAR 6
<b>Fluency</b>	<ul style="list-style-type: none"> <li>• to have secure knowledge and understanding within all the aspects of the Y1 curriculum and can make choices about which mathematics to use when calculating, solving problems and investigating.</li> <li>• Number sense is secure. Number bonds are used readily to solve calculations. The organisation of thinking, including practical resources and pictorial representations are integral to the working out. Recording is appropriate to the task set. Pupils are able to explore further and extend their number and mathematical skills through tasks which increase in complexity and depth.</li> </ul>	<ul style="list-style-type: none"> <li>• to have secure knowledge and understanding within all the aspects of the Y2 curriculum and can make choices about which mathematics to use when calculating, solving problems and investigating.</li> <li>• Number bonds and tables are used readily to solve calculations.</li> <li>• The inverse is used to work out missing number problems.</li> <li>• Commutativity is understood.</li> <li>• The organisation of thinking, including practical resources and pictorial representations are integral to the working out.</li> <li>• Recording is appropriate to the task set.</li> <li>• Pupils are able to explore further and extend their number and mathematical skills through tasks which increase in <b>complexity and depth</b>.</li> </ul>	<ul style="list-style-type: none"> <li>• to have secure knowledge and understanding within all the aspects of the Y3 curriculum and can make choices about which mathematics to use when calculating, solving problems and investigating.</li> <li>• Number bonds, complements, tables and place value are used readily to solve calculations.</li> <li>• To add and subtract fractions with the same denominator.</li> <li>• Appropriate choices about when to calculate mentally or when to use written methods are made with confidence.</li> <li>• The organisation of thinking, including practical resources and pictorial representations are integral to the working out.</li> <li>• Sophisticated models and images are used to secure conceptual understanding.</li> <li>• Recording is appropriate to the task set.</li> <li>• Pupils are able to explore further and extend their number and mathematical skills through tasks which increase in complexity and depth.</li> </ul>	<ul style="list-style-type: none"> <li>• to have secure knowledge and understanding within all the aspects of the Y4 curriculum and can make choices about which mathematics to use when calculating, solving problems and investigating.</li> <li>• Number facts, number systems and place value, including decimals, are used readily to solve calculations, solving problems and investigating.</li> <li>• Distributive law is used in multiplication. To add and subtract fractions with the same denominator.</li> <li>• Appropriate choices about when to calculate mentally or when to use written methods are made with confidence. Formal written methods are used efficiently with all appropriate working evident.</li> <li>• The organisation of thinking is effective to demonstrate understanding and diagrams and mathematical notation are used well.</li> <li>• Sophisticated models and images are used to secure conceptual understanding.</li> <li>• Recording is appropriate to the task set.</li> <li>• Pupils are able to explore further and extend their number and mathematical skills through tasks which increase in complexity and depth.</li> </ul>	<ul style="list-style-type: none"> <li>• to have secure knowledge and understanding within all the aspects of the Y5 curriculum and can make judgments about which mathematics to use when solving problems and investigating.</li> <li>• Patterns and relationships are used readily to solve equations and construct strategies for finding solutions.</li> <li>• To add and subtract fractions with the same denominator, and multiples of the denominator.</li> <li>• To multiply fractions.</li> <li>• The organisation of thinking and recording is appropriate to the task set.</li> <li>• Pupils are able to explore further and extend their number and mathematical skills through tasks which increase in complexity and depth</li> </ul>	<ul style="list-style-type: none"> <li>• to have secure knowledge and understanding within all the aspects of the Y6 curriculum and can make judgments about which mathematics to use when solving problems and investigating.</li> <li>• Patterns and relationships are used readily to solve equations and construct strategies for finding solutions.</li> <li>• The laws of arithmetic, including BODMAS are understood and applied.</li> <li>• The organisation of thinking and recording is appropriate to the task set.</li> <li>• Pupils can calculate with fractions, decimals and percentages.</li> <li>• Pupils are able to explore further and extend their number and mathematical skills through tasks which increase in complexity and depth.</li> </ul>



Problem Solving	<ul style="list-style-type: none"> <li>to be able to identify the mathematics required and respond to problems in a variety of contexts with increasing fluency.</li> <li>Problem solving includes real life contexts and cross curricular application.</li> </ul>	<ul style="list-style-type: none"> <li>to be able to identify the mathematics required and respond to problems in a variety of contexts with increasing fluency.</li> <li>Problem solving includes real contexts and cross curricular application.</li> <li>Problems with more than one step can be solved.</li> </ul>	<ul style="list-style-type: none"> <li>to be able to identify the mathematics required and respond to problems in a variety of contexts with increasing fluency.</li> <li>There is particular reference to the contexts of measures, money and time.</li> <li>Problem solving includes real life contexts and cross curricular application.</li> </ul>	<ul style="list-style-type: none"> <li>to be able to identify the mathematics required and respond to problems in a variety of contexts with increasing fluency.</li> <li>Multistep problems are readily solved in the contexts of measures, money and time.</li> <li>Problem solving includes real life contexts and cross curricular application.</li> </ul>	<ul style="list-style-type: none"> <li>to be able to interpret and respond to problems in a variety of contexts with mathematical fluency.</li> <li>Problem solving includes real life contexts and cross curricular application</li> </ul>	<ul style="list-style-type: none"> <li>to be able to interpret and respond to problems in a variety of contexts with mathematical fluency.</li> <li>Problem solving includes real life contexts and cross curricular application, including conversions.</li> </ul>
Reasoning	<ul style="list-style-type: none"> <li>to apply conceptual knowledge to recognise patterns and relationships, to show results using clear mathematical models such as practical apparatus, diagrams or number sentences.</li> </ul>	<ul style="list-style-type: none"> <li>to apply conceptual knowledge to recognise patterns and relationships,</li> <li>to explain results using clear mathematical models such as practical apparatus, diagrams or number sentences</li> </ul>	<ul style="list-style-type: none"> <li>to apply conceptual knowledge to use patterns, relationships and properties of number to begin to generalise.</li> <li>To explain results using clear mathematical models such as practical apparatus, diagrams or number sentences as models of proof.</li> </ul>	<ul style="list-style-type: none"> <li>to apply conceptual knowledge to use patterns, relationships and properties of number to draw conclusions and make general statements.</li> <li>Lines of enquiry are generated and justified with mathematical models.</li> <li>To explain results clearly using appropriate representations and communications to offer a proof.</li> </ul>	<ul style="list-style-type: none"> <li>to apply conceptual knowledge to make generalisations, conjecture relationships and provide sophisticated models of proof, including enquiry and reasoned argument.</li> </ul>	<ul style="list-style-type: none"> <li>to apply conceptual knowledge to make generalisations, conjecture relationships and provide sophisticated models of proof, including formula and reasoned argument.</li> </ul>