



# Becoming a Mathematician at Bonnygate Primary School



## Becoming a Mathematician at Bonnygate Primary School

### A Nursery Bonnygate Mathematician will:

### A Reception Bonnygate Mathematician will:

Number

- Compare amounts, saying 'lots', 'more' or 'same'.
- Develop counting-like behaviour, such as making sounds, pointing or saying some numbers in sequence.
- Count in everyday contexts, sometimes skipping numbers – '1-2-3-5'.
- Experiment with their own symbols and marks as well as numerals.
- Show 'finger numbers' up to 5.
- Compare quantities using language: 'more than', 'fewer than' 2.
- Say one number for each item in order: 1,2,3,4,5
- Solve real world mathematical problems with numbers up to 5.
- Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').
- Recite numbers past 5.
- Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').
- Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.

- Count objects, actions and sounds.
- Link the number symbol (numeral) with its cardinal number value.
- Count beyond ten.
- Explore the composition of numbers to 10.
- Compare numbers to 10.
- Automatically recall number bonds for numbers 0–10.
- Understand the 'one more than/one less than' relationship between consecutive numbers.
- Subitise (recognise quantities without counting) up to 5. (ELG)
- 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. (ELG)

#### **Early Learning Goals:**

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5.
- 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.

Numerical Patterns

- Build with a range of resources.
- Complete inset puzzles.
- Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc.
- Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc.
- Discuss routes and locations, using words like 'in front of' and 'behind'.
- Understand position through words alone – for example, "The bag is under the table," – with no pointing.
- Extend and create ABAB patterns – stick, leaf, stick, leaf.
- Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'
- Notice and correct an error in a repeating pattern.
- Combine shapes to make new ones – an arch, a bigger triangle, etc.
- Make comparisons between objects relating to size, length, weight and capacity
- Describe a familiar route.
- Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.

- Continue, copy and create repeating patterns.
- Compare length, weight and capacity.
- Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.
- Select, rotate and manipulate shapes in order to develop spatial reasoning skills.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. (ELG)
- Verbally count beyond 20, recognising the pattern of the counting system. (ELG)
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally. (ELG)

#### **Early Learning Goals:**

- Verbally count beyond 20, recognising the pattern of the counting system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.



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A Year 1 Bonnygate Mathematician will:		A Year 2 Bonnygate Mathematician will:
Counting	<ul style="list-style-type: none"> <li>Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.</li> <li>Count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens.</li> </ul>	<ul style="list-style-type: none"> <li>Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward.</li> </ul>
Place Value		<ul style="list-style-type: none"> <li>Recognise the place value of each digit in a two-digit number.</li> <li>Compare and order numbers from 0 up to 100; use <math>&lt;</math>, <math>&gt;</math> and <math>=</math> signs.</li> </ul>
Representing number	<ul style="list-style-type: none"> <li>Identify and represent numbers using objects and pictorial representations including the number line, &amp; use language of: equal to, more than, less than (fewer), most, least.</li> <li>Read and write numbers from 1 to 20 in numerals and words.</li> <li>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.</li> </ul>	<ul style="list-style-type: none"> <li>Identify, represent and estimate numbers using different representations, including the number line.</li> <li>Read and write numbers to at least 100 in numerals and in words.</li> </ul>
Number facts (+/-)	<ul style="list-style-type: none"> <li>Given a number, identify one more and one less.</li> <li>Represent and use number bonds and related subtraction facts within 20.</li> </ul>	<ul style="list-style-type: none"> <li>Use place value and number facts to solve problems.</li> <li>Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.</li> </ul>
Mental +/-	<ul style="list-style-type: none"> <li>Add and subtract one-digit and two-digit numbers to 20, including zero</li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <math>TU+U</math>, <math>TU+T</math>, <math>TU+TU</math> and <math>U+U+U</math>.</li> <li>Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.</li> </ul>
Problems +/-	<ul style="list-style-type: none"> <li>Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math>.</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems with addition and subtraction, using concrete, pictorial and abstract representations.</li> <li>Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</li> </ul>
Number facts ( $\times/\div$ )		<ul style="list-style-type: none"> <li>Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.</li> </ul>
Mental ( $\times/\div$ )		<ul style="list-style-type: none"> <li>Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (=) signs.</li> <li>Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.</li> </ul>
Problems ( $\times/\div$ )	<ul style="list-style-type: none"> <li>Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.</li> </ul>
Recognising	<ul style="list-style-type: none"> <li>Recognise, find and name a half as one of two equal parts of an</li> </ul>	<ul style="list-style-type: none"> <li>Recognise, find, name and write fractions <math>1/3</math>, <math>1/4</math>, <math>2/4</math> and <math>3/4</math> of a length, shape, set of</li> </ul>

fractions	<p>object, shape or quantity.</p> <ul style="list-style-type: none"> <li>Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.</li> </ul>	objects or quantity.
Fraction calculations		<ul style="list-style-type: none"> <li>Write simple fractions for example, <math>\frac{1}{2}</math> of 6 = 3 and recognise the equivalence of <math>\frac{2}{4}</math> and <math>\frac{1}{2}</math>.</li> </ul>
Measures	<ul style="list-style-type: none"> <li>Compare, describe and solve practical problems for: length/height, weight/mass, capacity/volume &amp; time.</li> <li>Measure and begin to record length/height, weight/mass, capacity/volume &amp; time.</li> </ul>	<ul style="list-style-type: none"> <li>Choose and use appropriate standard units to estimate and measure length/height (m/cm); mass (kg/g); temperature (<math>^{\circ}</math>C); capacity (litres/ml) to the nearest. appropriate unit, using rulers, scales, thermometers and measuring vessels</li> <li>Compare and order lengths, mass, volume/capacity and record the results using &gt;, &lt; and =</li> </ul>
Money	<ul style="list-style-type: none"> <li>Recognise and know the value of different denominations of coins and notes.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value.</li> <li>Find different combinations of coins that equal the same amounts of money.</li> <li>Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change.</li> </ul>
Time	<ul style="list-style-type: none"> <li>Sequence events in chronological order using language</li> <li>Recognise and use language relating to dates, including days of the week, weeks, months and years</li> <li>Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times</li> </ul>	<ul style="list-style-type: none"> <li>Compare and sequence intervals of time.</li> <li>Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.</li> <li>Know the number of minutes in an hour and the number of hours in a day.</li> </ul>
Shape vocabulary	<ul style="list-style-type: none"> <li>Recognise and name common 2-D shapes (e.g. Square, circle, triangle).</li> <li>Recognise and name common 3-D shapes (e.g. Cubes, cuboids, pyramids &amp; spheres).</li> </ul>	<ul style="list-style-type: none"> <li><i>(vertices, edges, faces, symmetry)</i></li> </ul>
Properties of 2-d shape		<ul style="list-style-type: none"> <li>Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line.</li> <li>Compare and sort common 2-D and 3-D shapes and everyday objects.</li> </ul>
Properties of 3-d shape		<ul style="list-style-type: none"> <li>Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces.</li> <li>Identify 2-D shapes on the surface of 3-D shapes.</li> <li>Compare and sort common 2-D and 3-D shapes and everyday objects.</li> </ul>
Position & Direction	<ul style="list-style-type: none"> <li>Describe position, direction and movement, including whole, half, quarter and three-quarter turns.</li> </ul>	<ul style="list-style-type: none"> <li>Order and arrange combinations of mathematical objects in patterns and sequences.</li> <li>Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right.</li> <li>Angles for quarter, half and <math>\frac{3}{4}</math> turns.</li> </ul>
Interpreting data		<ul style="list-style-type: none"> <li>Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.</li> </ul>
Extract info from		<ul style="list-style-type: none"> <li>Ask and answer simple questions by counting the number of objects in each category</li> </ul>

data

and sorting the categories by quantity.

- Ask and answer questions about totaling and comparing categorical data.



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A Year 3 Bonnygate Mathematician will:		A Year 4 Bonnygate Mathematician will:
Counting	<ul style="list-style-type: none"> <li>Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.</li> </ul>	<ul style="list-style-type: none"> <li>Count in multiples of 6, 7, 9, 25 and 1000.</li> <li>Find 1000 more or less than a given number.</li> <li>Count backwards through zero to include negative numbers.</li> </ul>
Place Value	<ul style="list-style-type: none"> <li>Recognise the place value of each digit in a three-digit number.</li> <li>Compare and order numbers up to 1000.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise the place value of each digit in a four-digit number.</li> <li>Order and compare numbers beyond 1000.</li> <li>Round any number to the nearest 10, 100 or 1000.</li> </ul>
Representing number	<ul style="list-style-type: none"> <li>Identify, represent and estimate numbers using different representations.</li> <li>Read and write numbers up to 1000 in numerals and in words.</li> </ul>	<ul style="list-style-type: none"> <li>Identify, represent and estimate numbers using different representations.</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>
Mental +/-	<ul style="list-style-type: none"> <li>Add and subtract numbers mentally, including: HTU+U, HTU+T and HTU+H.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
Written +/-	<ul style="list-style-type: none"> <li>Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.</li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.</li> </ul>
Problems +/-	<ul style="list-style-type: none"> <li>Estimate the answer to a calculation and use inverse operations to check answers.</li> <li>Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</li> </ul>	<ul style="list-style-type: none"> <li>Estimate and use inverse operations to check answers to a calculation.</li> <li>Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>
Number facts (x/÷)	<ul style="list-style-type: none"> <li>Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.</li> </ul>	<ul style="list-style-type: none"> <li>Recall multiplication and division facts for multiplication tables up to <math>12 \times 12</math>.</li> </ul>
Mental (x/÷)	<ul style="list-style-type: none"> <li>Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods.</li> </ul>	<ul style="list-style-type: none"> <li>Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers.</li> <li>Recognise and use factor pairs and commutativity in mental calculations.</li> </ul>
Written (x/÷)	<ul style="list-style-type: none"> <li>Progress to formal written methods calculations as above.</li> </ul>	<ul style="list-style-type: none"> <li>Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.</li> </ul>
Problems (x/÷)	<ul style="list-style-type: none"> <li>Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects</li> </ul>
Recognising fractions	<ul style="list-style-type: none"> <li>Count up and down in tenths;</li> <li>Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10.</li> </ul>	<ul style="list-style-type: none"> <li>Count up and down in hundredths;</li> <li>Recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.</li> </ul>
Comparing fractions	<ul style="list-style-type: none"> <li>Compare and order unit fractions, and fractions with the same denominators.</li> <li>Recognise and show, using diagrams, equivalent fractions with small denominators.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise and show, using diagrams, families of common equivalent fractions.</li> </ul>
Finding fractions of quantities	<ul style="list-style-type: none"> <li>Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.</li> <li>Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number.</li> </ul>

Fraction calculations	<ul style="list-style-type: none"> <li>Add and subtract fractions with the same denominator within one whole [for example, <math>5/7 + 1/7 = 6/7</math>].</li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract fractions with the same denominator.</li> </ul>
Decimals as fractional amounts	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Recognise and write decimal equivalents of any number of tenths or hundredths</li> <li>Recognise and write decimal equivalents to <math>\frac{1}{4}</math>, <math>\frac{1}{2}</math> and <math>\frac{3}{4}</math>.</li> <li>Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.</li> </ul>
Ordering decimals	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Round decimals with one decimal place to the nearest whole number.</li> <li>Compare numbers with the same number of decimal places up to two decimal places.</li> </ul>
Fraction problems	<ul style="list-style-type: none"> <li>Solve problems using all fraction knowledge.</li> </ul>	<ul style="list-style-type: none"> <li>Solve simple measure and money problems involving fractions and decimals to two decimal places.</li> </ul>
Measures	<ul style="list-style-type: none"> <li>Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).</li> </ul>	<ul style="list-style-type: none"> <li>Convert between different units of measure.</li> <li>Estimate, compare and calculate different measures, including money in pounds and pence.</li> </ul>
Mensuration	<ul style="list-style-type: none"> <li>Measure the perimeter of simple 2-D shapes.</li> </ul>	<ul style="list-style-type: none"> <li>Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres.</li> <li>Find the area of rectilinear shapes by counting squares.</li> </ul>
Money	<ul style="list-style-type: none"> <li>Add and subtract amounts of money to give change, using both £ and p in practical contexts.</li> </ul>	
Time	<ul style="list-style-type: none"> <li>Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks.</li> <li>Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight.</li> <li>Know the number of seconds in a minute and the number of days in each month, year and leap year.</li> <li>Compare durations of events.</li> </ul>	<ul style="list-style-type: none"> <li>Convert between different units of measure (e.g. Hours to minutes).</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>
Shape vocabulary	<ul style="list-style-type: none"> <li>Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.</li> </ul>	
Properties of 2-d shape	<ul style="list-style-type: none"> <li>Draw 2-D shapes.</li> </ul>	<ul style="list-style-type: none"> <li>Compare and classify geometric shapes, including quadrilaterals and triangles, based on properties and sizes.</li> <li>Identify lines of symmetry in 2-D shapes presented in different orientations.</li> <li>Complete a simple symmetric figure with respect to a specific line of symmetry.</li> </ul>
Properties of 3-d shape	<ul style="list-style-type: none"> <li>Make 3-D shapes using modelling materials.</li> <li>Recognise 3-D shapes in different orientations and describe them.</li> </ul>	
Angles	<ul style="list-style-type: none"> <li>Recognise angles as a property of shape or a description of a turn.</li> <li>Identify right angles, recognise that two right angles make a half- turn, three make three quarters of a turn and four a complete turn.</li> <li>Identify whether angles are greater or less than right angle.</li> </ul>	<ul style="list-style-type: none"> <li>Identify acute and obtuse angles and compare and order angles up to two right angles by size.</li> </ul>
Position & Direction		<ul style="list-style-type: none"> <li>Describe positions on a 2-D grid as coordinates in the first quadrant.</li> <li>Describe movements between positions as translations of a given unit to the left/right and up/down.</li> <li>Plot specified points and draw sides to complete a given polygon.</li> </ul>

Interpreting data	<ul style="list-style-type: none"><li>• Interpret and present data using bar charts, pictograms and tables.</li></ul>	<ul style="list-style-type: none"><li>• Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.</li></ul>
Extract info from data	<ul style="list-style-type: none"><li>• Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.</li></ul>	<ul style="list-style-type: none"><li>• Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.</li></ul>



# Becoming a Mathematician Expert at Bonnygate Primary School



## Becoming a Mathematician at Bonnygate Primary School

### A Year 5 Bonnygate Mathematician Expert will:

### A Year 6 Bonnygate Mathematician Expert will:

Counting	<ul style="list-style-type: none"> <li>Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.</li> <li>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.</li> </ul>	<ul style="list-style-type: none"> <li>Use negative numbers in context, and calculate intervals across zero.</li> </ul>
Place Value	<ul style="list-style-type: none"> <li>Read, write, order and compare numbers up to 1 000 000 and determine the value of each digit.</li> <li>Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.</li> </ul>	<ul style="list-style-type: none"> <li>Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.</li> <li>Round any whole number to a required degree of accuracy.</li> </ul>
Representing number	<ul style="list-style-type: none"> <li>Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.</li> <li>Recognise and use square numbers and cube numbers, and the notation for squared (<sup>2</sup>) and cubed (<sup>3</sup>).</li> </ul>	
Mental +/-	<ul style="list-style-type: none"> <li>Add and subtract numbers mentally with increasingly large numbers.</li> </ul>	<ul style="list-style-type: none"> <li>Perform mental calculations, including with mixed operations and large numbers.</li> </ul>
Written +/-	<ul style="list-style-type: none"> <li>Add and subtract whole numbers with more than 4 digits, including using formal written methods.</li> </ul>	
Problems +/-	<ul style="list-style-type: none"> <li>Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.</li> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>	
Number facts (x/÷)	<ul style="list-style-type: none"> <li>Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.</li> <li>Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.</li> <li>Establish whether a number up to 100 is prime and recall prime numbers up to 19.</li> </ul>	<ul style="list-style-type: none"> <li>Identify common factors, common multiples and prime numbers.</li> </ul>
Mental (x/÷)	<ul style="list-style-type: none"> <li>Multiply and divide numbers mentally drawing upon known facts.</li> <li>Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.</li> </ul>	<ul style="list-style-type: none"> <li>Perform mental calculations, including with mixed operations and large numbers.</li> </ul>
Written (x/÷)	<ul style="list-style-type: none"> <li>Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers.</li> </ul>	<ul style="list-style-type: none"> <li>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.</li> </ul>



	<ul style="list-style-type: none"> <li>Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.</li> </ul>	<ul style="list-style-type: none"> <li>Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.</li> <li>Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to context.</li> </ul>
Problems ( $\times/\div$ )	<ul style="list-style-type: none"> <li>Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.</li> <li>Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.</li> <li>Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</li> </ul>	<ul style="list-style-type: none"> <li>Use their knowledge of the order of operations to carry out calculations involving the four operations.</li> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> <li>Solve problems involving addition, subtraction, multiplication and division.</li> <li>Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</li> </ul>
Recognising fractions	<ul style="list-style-type: none"> <li>Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements <math>&gt; 1</math> as a mixed number.</li> </ul>	
Comparing fractions	<ul style="list-style-type: none"> <li>Compare and order fractions whose denominators are all multiples of the same number.</li> <li>Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.</li> </ul>	<ul style="list-style-type: none"> <li>Use common factors to simplify fractions.</li> <li>Use common multiples to express fractions in the same denomination.</li> <li>Compare and order fractions, including fractions <math>&gt; 1</math>.</li> </ul>
Fraction calculations	<ul style="list-style-type: none"> <li>Add and subtract fractions with the same denominator and denominators that are multiples of the same number.</li> <li>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.</li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.</li> <li>Multiply simple pairs of proper fractions, writing the answer in its simplest form</li> <li>Divide proper fractions by whole numbers.</li> </ul>
Decimals as fractional amounts	<ul style="list-style-type: none"> <li>Read and write decimal numbers as fractions.</li> </ul>	<ul style="list-style-type: none"> <li>Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction.</li> <li>Identify the value of each digit in numbers given to three decimal places.</li> </ul>
Ordering decimals	<ul style="list-style-type: none"> <li>Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.</li> <li>Round decimals with two decimal places to the nearest whole number and to one decimal place.</li> <li>Read, write, order and compare numbers with up to three decimal places.</li> </ul>	
Calculating with decimals		<ul style="list-style-type: none"> <li>Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.</li> <li>Multiply one-digit number with up to two decimal places by whole numbers.</li> </ul>

		<ul style="list-style-type: none"> <li>Use written division methods in cases where the answer has up to two decimal places.</li> </ul>
Percentages	<ul style="list-style-type: none"> <li>Recognise the per cent symbol (%) and understand that per cent.</li> <li>Relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal.</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison.</li> </ul>
Fraction problems	<ul style="list-style-type: none"> <li>Solve problems involving number up to three decimal places.</li> <li>Solve 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> </ul>	<ul style="list-style-type: none"> <li>Solve problems which require answers to be rounded to specified degrees of accuracy.</li> <li>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</li> </ul>
Ratio & Proportion		<ul style="list-style-type: none"> <li>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.</li> <li>Solve problems involving similar shapes where the scale factor is known or can be found.</li> <li>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</li> </ul>
Algebra		<ul style="list-style-type: none"> <li>Use 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>
Measures	<ul style="list-style-type: none"> <li>Convert between different units of metric measure.</li> <li>Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.</li> <li>Estimate volume and capacity.</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.</li> <li>Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places.</li> <li>Convert between miles and kilometres.</li> </ul>
Mensuration	<ul style="list-style-type: none"> <li>Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.</li> <li>Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise that shapes with the same areas can have different perimeters and vice versa.</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>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.</li> </ul>
Money	<ul style="list-style-type: none"> <li>Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.</li> </ul>	
Time	<ul style="list-style-type: none"> <li>Solve problems involving converting between units of time.</li> </ul>	

Shape vocabulary		<ul style="list-style-type: none"> <li>Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.</li> </ul>
Properties of 2-d shape	<ul style="list-style-type: none"> <li>Use the properties of rectangles to deduce related facts and find missing lengths and angles.</li> <li>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</li> </ul>	<ul style="list-style-type: none"> <li>Draw 2-D shapes using given dimensions and angles.</li> <li>Compare and classify geometric shapes based on their properties and sizes.</li> </ul>
Properties of 3-d shape	<ul style="list-style-type: none"> <li>Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise, describe and build simple 3-D shapes, including making nets.</li> <li>Find unknown angles in any triangles, quadrilaterals, and regular polygons.</li> </ul>
Angles	<ul style="list-style-type: none"> <li>Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.</li> <li>Draw given angles, and measure them in degrees (<math>^{\circ}</math>).</li> <li>Identify angles at a point and one whole turn (total <math>360^{\circ}</math>); at a point on a straight line and <math>\frac{1}{2}</math> a turn (total <math>180^{\circ}</math>).</li> <li>Identify other multiples of <math>90^{\circ}</math>.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</li> </ul>
Position & Direction	<ul style="list-style-type: none"> <li>Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.</li> </ul>	<ul style="list-style-type: none"> <li>Describe positions on the full coordinate grid (all four quadrants).</li> <li>Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</li> </ul>
Interpreting data	<ul style="list-style-type: none"> <li>Complete, read and interpret information in tables, including timetables.</li> </ul>	<ul style="list-style-type: none"> <li>Interpret and construct pie charts and line graphs calculate and interpret the mean as an average.</li> </ul>
Extract info from data	<ul style="list-style-type: none"> <li>Solve comparison, sum and difference problems using information presented in a line graph.</li> </ul>	<ul style="list-style-type: none"> <li>Use pie charts and line graphs to solve problems.</li> </ul>