



## Year 5 Programme of Study

Mathematics Mastery is fully aligned to the National Curriculum. Our Programmes of Study outline the objectives taught throughout the year in Mathematics Mastery lessons\*.

\*Some National Curriculum objectives are also further embedded during Maths Meetings, see Maths Meeting termly guidance [here](#).

<b>Autumn</b>	<b>1. Reasoning with large whole numbers</b>  <b>(2 weeks)</b>	<ul style="list-style-type: none"> <li>• read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</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>• solve number problems and practical problems that involve all of the above</li> <li>• read Roman numerals to 1000 (M) and recognise years written in Roman numerals</li> </ul>
	<b>2. Problem solving with integer addition and subtraction</b>  <b>(2 weeks)</b>	<ul style="list-style-type: none"> <li>• add and subtract numbers mentally with increasingly large numbers</li> <li>• add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</li> <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>
	<b>3. Line graphs and timetables</b>  <b>(2 weeks)</b>	<ul style="list-style-type: none"> <li>• solve comparison, sum and difference problems using information presented in a line graph</li> <li>• complete, read and interpret information in tables, including timetables</li> <li>• solve problems involving converting between units of time</li> </ul>
	<b>4. Multiplication and division</b>  <b>(3 weeks)</b>	<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>• recognise and use square numbers and the notation for squared (<math>^2</math>)</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> <li>• multiply and divide whole numbers by 10, 100 and 1000</li> <li>• multiply and divide numbers mentally drawing upon known facts</li> <li>• solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</li> <li>• multiply numbers up to 4 digits by a one- or two-digit number using a formal written method</li> <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> <li>• solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</li> </ul>
	<b>5. Perimeter and area</b>  <b>(1 week)</b>	<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 (<math>\text{cm}^2</math>) and square metres (<math>\text{m}^2</math>) and estimate the area of non-rectilinear shapes</li> </ul>



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<b>Spring</b>	<b>6. Fractions and decimals</b>  <b>(3 weeks)</b>	<ul style="list-style-type: none"> <li>compare and order fractions whose denominators are all multiples of the same number</li> <li>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</li> <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 [for example, <math>\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}</math>]</li> <li>identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths</li> <li>read and write decimal numbers as fractions [for example, <math>0.71 = \frac{71}{100}</math>]</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>
	<b>7. Angles</b>  <b>(2 weeks)</b>	<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>); angles at a point on a straight line and <math>\frac{1}{2}</math> a turn (total <math>180^{\circ}</math>); other multiples of <math>90^{\circ}</math></li> </ul>
	<b>8. Fractions, decimals and percentages</b>  <b>(3 weeks)</b>	<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> <li>solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</li> <li>recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal</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 fraction and decimal equivalents of percentages that are multiples of 10 and 25</li> <li>solve problems involving number up to three decimal places</li> <li>use all four operations to solve problems involving measure (for example length, mass, volume, money) using decimal notation, including scaling</li> </ul>
	<b>9. Transformations</b>  <b>(2 weeks)</b>	<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> <li>use the properties of rectangles to deduce related facts and find missing lengths and angles</li> <li>describe positions on the full coordinate grid (all four quadrants) (Y6 objective)</li> <li>interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero (through coordinates context)</li> </ul>



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<b>Summer</b>	<b>10. Converting units of measure</b>  <b>(2 week)</b>	<ul style="list-style-type: none"> <li>convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram)</li> <li>multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</li> <li>understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints</li> </ul>
	<b>11. Calculating with whole numbers and decimals</b>  <b>(3 weeks)</b>	<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> <li>solve problems involving number up to three decimal places</li> <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> <li>multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</li> </ul>
	<b>12. 2-D and 3-D shape</b>  <b>(2 weeks)</b>	<ul style="list-style-type: none"> <li>distinguish between regular and irregular polygons based on reasoning about equal sides and angles</li> <li>use the properties of rectangles to deduce related facts and find missing lengths and angles</li> <li>identify 3-D shapes, including cubes and other cuboids, from 2-D representations</li> <li>recognise, describe and build simple 3-D shapes, including making nets (Y6 objective)</li> <li>illustrate and name parts of circles, including radius, diameter and circumference and know that diameter is twice the radius. (Y6 objective)</li> </ul>
	<b>13. Volume</b>  <b>(1 week)</b>	<ul style="list-style-type: none"> <li>estimate volume [for example, using 1 cm<sup>3</sup> blocks to build cuboids (including cubes)] and capacity [for example, using water]</li> <li>recognise and use cube numbers and the notation for cubed (<sup>3</sup>)</li> </ul>
	<b>14. Problem solving</b>  <b>(2 weeks)</b>	<ul style="list-style-type: none"> <li>interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero</li> <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> <li>interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (for example, <math>98 \div 4 = 4 \text{ r } 2</math>, <math>98 = 24 \text{ r } 2 = 24 \text{ r } 2 = 24.5 \approx 25</math>). (Non-statutory)</li> <li>calculate and interpret the mean as an average (Y6 objective)</li> </ul>