



National Curriculum for Mathematics: 2014			
	Year 4	Year 5	Year 6
Number and Place Value	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Count in multiples of 6, 7, 9, 25 and 100</li> <li>Find 1000 more or less than a given number</li> <li>Count backwards through zero to include negative numbers</li> <li>Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones)</li> <li>Order and compare numbers beyond 1000</li> <li>Identify, represent and estimate numbers using different representations</li> <li>Round any number to the nearest 10, 100 or 1000</li> <li>Solve number and practical problems that involve all of the above and with increasingly large positive numbers</li> <li>Read Roman numerals to 100 (I to C) and understand how, over time, the numeral system changed to include the concept of zero and place value</li> </ul>	<p>Pupils should be taught to:</p> <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>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero</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>	<p>Pupils should be taught to:</p> <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> <li>Use negative numbers in context, and calculate intervals across zero</li> <li>Solve number problems and practical problems that involve all of the above.</li> </ul>
Addition and subtraction	<p>Pupils should be taught to:</p> <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> <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>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</li> <li>Add and subtract numbers mentally with increasingly large numbers</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>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>



Multiplication and division	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Recall multiplication and division facts for multiplication tables up to 12 x 12</li> <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 commutatively in mental calculations</li> <li>Multiply two-digit and three-digit numbers by a one-digit number using formal written layout</li> <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 which n objects are connected to m objects.</li> </ul>	<p>Pupils should be taught to:</p> <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> <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 numbers mentally drawing upon known facts</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>Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</li> <li>Recognise and use square numbers and cube numbers, and the notation for squared (<math>^2</math>) and cubed (<math>^3</math>)</li> <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>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the efficient written method of long multiplication</li> <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> <li>Perform mental calculations, including with mixed operations and large numbers</li> <li>Identify common factors, common multiples and prime numbers</li> <li>Use their knowledge of the order of operations to carry out calculations involving the four operations</li> <li>Using their knowledge of the order of operations to carry out calculations involving the four operations</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, levels of accuracy</li> </ul>
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Fractions (including decimals and percentages)	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• Recognise and show, using diagrams, families of common equivalent fractions</li> <li>• Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten</li> <li>• Solve problems involving increasingly harder fractions to calculate quantities, including non-unit fractions where the answer is a whole number</li> <li>• Add and subtract fractions with the same denominator.</li> <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>; <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> <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> <li>• Solve simple measures and money problems involving fractions and decimals to two decimal places</li> </ul>	<p>Pupils should be taught to:</p> <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> <li>• Recognise mixed numbers and improper fractions and convert from one to the other and write mathematical statements <math>&gt;1</math> as a mixed number (e.g. <math>2/5 + 4/5 = 6/5 = 1 \frac{1}{5}</math>)</li> <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>• Read and write decimal numbers as fractions (e.g. <math>0.71 = 71/100</math>)</li> <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> <li>• Solve problems involving numbers up to three decimal places</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 those fractions with a denominator of a multiple of 10 or 25</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• Use common factors to simplify fractions; use common multiples to express fractions in the same denomination</li> <li>• Compare and order fractions including fractions <math>&gt;1</math></li> <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 (e.g. <math>\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}</math>)</li> <li>• Divide proper fractions by whole numbers (e.g. <math>1/3 \div 2 = 1/6</math>)</li> <li>• Associate a fraction with division and calculate decimal fraction equivalents (e.g. <math>0.375</math>) for a simple fraction (e.g. <math>3/8</math>)</li> <li>• Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places</li> <li>• Multiply one-digit numbers with up to two decimal places by whole numbers</li> <li>• Use written division methods in cases where the answer has up to two decimal places</li> <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>
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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Ratio and proportion</p>			<p>Pupils should be taught to:</p> <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 the calculation of percentages (e.g of measures, and such as 15% of 360) and the use of percentages for comparison</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>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Algebra</p>			<p>Pupils should be taught to:</p> <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 number sentences involving two unknowns</li> <li>• Enumerate possibilities of combinations of two variables.</li> </ul>



Measurement	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Convert between different units of measure (e.g. kilometre to metre; hour to minute)</li> <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</li> <li>Estimate, compare and calculate different measures, 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>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Convert between different units of measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)</li> <li>Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints</li> <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> <li>Estimate volume (e.g. using 1 cm<sup>3</sup> blocks to build cuboids (including cubes)) and capacity (e.g. using water)</li> <li>Solve problems involving converting between units of time</li> <li>Use all four operations to solve problems involving measure (for example, length, mass, volume, money) using decimal notation, including scaling</li> </ul>	<p>Pupils should be taught to:</p> <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 three decimal places</li> <li>Convert between miles and kilometre</li> <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>Recognise when it is necessary to use the formulae for area and volume of shapes</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>
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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Geometry: properties of shape</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</li> <li>Identify acute and obtuse angles and compare and order angles up to two right angles by size</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>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Identify 3-D shapes, including cubes and cuboids, from 2-D representations</li> <li>Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles</li> <li>draw given angles, measuring them in degrees (<math>^{\circ}</math>)</li> <li>Identify                         <ul style="list-style-type: none"> <li>Angles at a point and one whole turn (total <math>360^{\circ}</math>)</li> <li>Angles at a point on a straight line and <math>\frac{1}{2}</math> a turn (total <math>180^{\circ}</math>)</li> <li>Other multiples of <math>90^{\circ}</math></li> </ul> </li> <li>use the properties of a rectangle 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>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>draw 2D shapes using given dimensions and angles</li> <li>recognise, describe and build simple 3-D shapes, including making nets</li> <li>compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons</li> <li>illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius</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>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Geometry: position, direction, motion</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Describe positions on a 2-D grid as coordinates in the first quadrant</li> <li>Describe movement 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>	<p>Pupils should be taught to:</p> <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>	<p>Pupils should be taught to:</p> <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>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Statistics</p>	<p>Pupils should be taught to:</p> <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> <li>Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.</li> </ul>	<p>Pupils should be taught to:</p> <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> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Interpret and construct pie charts and line graphs and use these to solve problems</li> <li>Calculate and interpret the mean as an average</li> </ul>