# Long term planning Key Stage 2- Year 5 and 6

## Mathematics

| Number and place value- Year 5 | Number and place value- Year 6 |
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| Children should be taught to:<br>Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.<br>Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.<br>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero.<br>Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.<br>Solve number problems and practical problems that involve all of the above.<br>Read Roman numerals to 1000 (M) and recognise years written in Roman numerals. | Children should be taught to:<br>Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.<br>Round any whole number to a required degree of accuracy.<br>Use negative numbers in context, and calculate intervals across zero.<br>Solve number and practical problems that involve all of the above. |

| Addition and Subtraction- Year 5 | Addition, Subtraction Multiplication and Division- Year 6 |
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| Children should be taught to:<br>Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).<br>Add and subtract numbers mentally with increasingly large numbers.<br>Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.<br>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. | Children should be taught to:<br>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.<br>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.<br>Perform mental calculations, including with mixed operations and large numbers.<br>Identify common factors, common multiples and prime numbers.<br>Use their knowledge of the order of operations to carry out calculations involving the four operations.<br>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.<br>Solve problems involving addition, subtraction, multiplication and division.<br>Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy. |

| Multiplication and Division- Year 5 | |
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| Children should be taught to:<br>Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.<br>Solve problems involving multiplication and division where larger numbers are used by decomposing them into their factors.<br>Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.<br>Establish whether a number up to 100 is prime and recall prime numbers up to 19.<br>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.<br>Multiply and divide numbers mentally drawing upon known facts.<br>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.<br>Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.<br><br>Recognise and use square numbers and cube numbers, and the notation for squared ($^2$) and cubed ($^3$).<br>Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.<br>Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates. | |

| Fractions including decimals and percentages- Year 5 | Fractions including decimals and percentages - Year 6 |
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| Children should be taught to:<br>Compare and order fractions whose denominators are all multiples of the same number.<br>Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.<br>Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)<br>Add and subtract fractions with the same denominator and multiples of the same number.<br>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.<br>Read and write decimal numbers as fractions (e.g. 0.71 = $\frac{71}{100}$)<br>Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.<br>Round decimals with two decimal places to the nearest whole number and to one decimal place.<br>Read, write, order and compare numbers with up to three decimal places.<br>Solve problems involving number up to three decimal places. | Children should be taught to:<br>Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.<br>Compare and order fractions, including fractions >1.<br>Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.<br>Multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$)<br>Divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)<br>Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)<br>Identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places. |

| 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 hundred, and as a decimal fraction.<br><br>Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25. | Multiply one-digit numbers with up to two decimal places by whole numbers.<br>Use written division methods in cases where the answer has up to two decimal places.<br>Solve problems which require answers to be rounded to specified degrees of accuracy.<br>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. |
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| **Measurement- Year 5** | **Measurement- Year 6** |
| Children should be taught to:<br>Convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre).<br>Understand and use equivalences between metric units and common imperial units such as inches, pounds and pints.<br>Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.<br>Calculate and compare the area of squares and rectangles including using standard units, square centimetres ($cm^2$) and square metres ($m^2$) and estimate the area of irregular shapes.<br>Estimate volume (e.g. using 1 $cm^3$ blocks to build cubes and cuboids) and capacity (e.g. using water).<br>Solve problems involving converting between units of time.<br>Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling. | Children should be taught to:<br>Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.<br>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.<br>Convert between miles and kilometres.<br>Recognise that shapes with the same areas can have different perimeters and vice versa.<br>Recognise when it is possible to use formulae for area and volume of shapes.<br>Calculate the area of parallelograms and triangles.<br>Calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed ($cm^3$) and cubic metres ($m^3$), and extending to other units. |
| **Properties of Shape- Year 5** | **Properties of Shape- Year 6** |
| Children should be taught to:<br>Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.<br>Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.<br>Draw given angles, and measure them in degrees ($^\circ$)<br>Identify angles at a point and one whole turn (total $360^\circ$)<br>Identify angles at a point on a straight line and ½ a turn (total $180^\circ$)<br>Identify other multiples of $90^\circ$<br>Use the properties of rectangles to deduce related facts and find missing lengths and angles.<br>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. | Children should be taught to:<br>Draw 2-D shapes using given dimensions and angles.<br>Recognise, describe and build simple 3-D shapes, including making nets.<br>Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.<br>Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.<br>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. |
| **Position and Direction- Year 5** | **Position and Direction- Year 6** |
| Children should be taught to:<br>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. | Children should be taught to:<br>Describe positions on the full coordinate grid (all four quadrants).<br>Draw and translate simple shapes on the coordinate plane, and reflect them in the axes. |
| **Statistics- Year 5** | **Statistics- Year 6** |
| Children should be taught to:<br>Solve comparison, sum and difference problems using information presented in a line graph.<br>Complete, read and interpret information in tables, including timetables. | Children should be taught to:<br>Interpret and construct pie charts and line graphs and use these to solve problems.<br>Calculate and interpret the mean as an average. |
| | **Ratio and Proportion- Year 6** |
| | Children should be taught to:<br>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.<br>Solve problems involving the calculation of percentages (e.g. of measures) such as 15% of 360 and the use of percentages for comparison.<br>Solve problems involving similar shapes where the scale factor is known or can be found.<br>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. |
| | **Algebra- Year 6** |
| | Children should be taught to:<br>Express missing number problems algebraically.<br>Use simple formulae expressed in words.<br>Generate and describe linear number sequences.<br>Find pairs of numbers that satisfy number sentences involving two unknowns.<br>Enumerate all possibilities of combinations of two variables. |