# Year 5

## Number

| Number and Place Value | Addition and Subtraction | Multiplication and Division | Fractions (including decimals and percentages) |
|---|---|---|---|
| Pupils 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, including 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. | Pupils 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. | Pupils should be taught to:<br>▪ identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers<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>▪ recognise and use square numbers and cube numbers, and the notation for squared ($^2$) and | Pupils 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 [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]<br>▪ add and subtract fractions with the same denominator and denominators that are 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 [for example, 0.71 = $\frac{71}{100}$]<br>▪ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents |

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| | | cubed ($^3$)<br>▪ solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes<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. | ▪ 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<br>▪ 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<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 fractions with a denominator of a multiple of 10 or 25. |

## Measurement

Pupils should be taught to:

- convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres ($cm^2$) and square metres ($m^2$) and estimate the area of irregular shapes
- estimate volume [for example, using 1 $cm^3$ blocks to build cuboids (including cubes)] and capacity [for example, using water]
- solve problems involving converting between units of time
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

| | Geometry - | | Statistics |
|---|---|---|---|
| | Properties of Shapes | Position and Direction | Pupils 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. |
| | Pupils 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 ($^o$)<br>identify:<br>angles at a point and one whole turn (total 360$^o$)<br>angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180$^o$)<br>other multiples of 90$^o$<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. | Pupils 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. | |

# Year 6

## Number

| Number and Place Value | Addition and Subtraction | Multiplication and Division | Fractions (including decimals and percentages) |
|---|---|---|---|
| Pupils 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. | Pupils 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>▪ 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 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, an appropriate degree of accuracy. | | Pupils 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 [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]<br>▪ divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]<br>▪ associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]<br>▪ 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 |

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- multiply one-digit numbers with up to two decimal places by whole numbers
- use written division methods in cases where the answer has up to two decimal places
- solve problems which require answers to be rounded to specified degrees of accuracy
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

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<tr><td colspan="2">Ratio and Proportion</td><td>Algebra</td></tr>
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Pupils should be taught to:

- solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
- solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
- solve problems involving similar shapes where the scale factor is known or can be found
- solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

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Pupils should be taught to:

- use simple formulae
- generate and describe linear number sequences
- express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables.

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<tr><td colspan="3">Measurement</td></tr>
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Pupils should be taught to:

- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
- 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
- convert between miles and kilometres
- recognise that shapes with the same areas can have different perimeters and vice versa

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- recognise when it is possible to use formulae for area and volume of shapes
- calculate the area of parallelograms and triangles
- calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres ($cm^3$) and cubic metres ($m^3$), and extending to other units [for example, $mm^3$ and $km^3$].
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| | Geometry - | | Statistics |
|---|---|---|---|
| | Properties of Shapes | Position and Direction | Pupils 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. |
| | Pupils 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. | Pupils 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. | |