

## National Centre for Excellence in the Teaching of Mathematics

### National Curriculum: Year Overview - Year 5

#### Number and Place Value

- ▶ read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
- ▶ count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
- ▶ interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
- ▶ round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- ▶ solve number problems and practical problems that involve all of the above
- ▶ read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

#### Addition and Subtraction

- ▶ add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- ▶ add and subtract numbers mentally with increasingly large numbers
- ▶ use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- ▶ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

#### Multiplication and Division

identify multiples and factors:

- ▶ identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers
- ▶ know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- ▶ establish whether a number up to 100 is prime and recall prime numbers up to 19

- ▶ 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
- ▶ multiply and divide numbers mentally, drawing upon known facts
- ▶ 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
- ▶ multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- ▶ recognise and use square numbers and cube numbers, and the notation for squared ( $^2$ ) and cubed ( $^3$ )
- ▶ solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes
- ▶ solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- ▶ solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

## Fractions (including decimals and percentages)

- ▶ compare and order fractions whose denominators are all multiples of the same number
- ▶ identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- ▶ 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,  $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$ ]
- ▶ add and subtract fractions with the same denominator and denominators that are multiples of the same number
- ▶ multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- ▶ read and write decimal numbers as fractions [for example,  $0.71 = \frac{71}{100}$ ]
- ▶ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- ▶ round decimals with two decimal places to the nearest whole number and to one decimal place
- ▶ read, write, order and compare numbers with up to three decimal places
- ▶ solve problems involving number 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 100, and as a decimal

- ▶ solve problems which require knowing percentage and decimal equivalents of  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{2}{5}$  and those fractions with a denominator of a multiple of 10 or 25.

## Measurement

- ▶ 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 ( $\text{cm}^2$ ) and square metres ( $\text{m}^2$ ) and estimate the area of irregular shapes
- ▶ estimate volume [for example, using  $1 \text{ cm}^3$  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 - properties of space

- ▶ identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- ▶ know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- ▶ draw given angles, and measure them in degrees ( $^\circ$ )
- ▶ identify:
  - ▶ angles at a point and one whole turn (total  $360^\circ$ )
  - ▶ angles at a point on a straight line and  $\frac{1}{2}$  a turn (total  $180^\circ$ )
  - ▶ other multiples of  $90^\circ$
- ▶ use the properties of rectangles to deduce related facts and find missing lengths and angles
- ▶ distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

## Geometry - position and direction

- ▶ 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.

## Statistics

- ▶ solve comparison, sum and difference problems using information presented in a line graph
- ▶ complete, read and interpret information in tables, including timetables.