

## National Centre for Excellence in the Teaching of Mathematics

### National Curriculum: Year Overview - Year 6

#### Number – number and place value

- ▶ read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
- ▶ round any whole number to a required degree of accuracy
- ▶ use negative numbers in context, and calculate intervals across zero
- ▶ solve number problems and practical problems that involve all of the above.

#### Number - addition, subtraction, multiplication and division

- ▶ multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- ▶ 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
- ▶ 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
- ▶ perform mental calculations, including with mixed operations and large numbers
- ▶ identify common factors, common multiples and prime numbers
- ▶ use their knowledge of the order of operations to carry out calculations involving the four operations
- ▶ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- ▶ solve problems involving addition, subtraction, multiplication and division
- ▶ use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

#### Number - fractions (including decimals and percentages)

- ▶ use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- ▶ compare and order fractions, including fractions  $>1$
- ▶ add and subtract fractions with different denominators and mixed numbers, using the

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- concept of equivalent fractions
- ▶ multiply simple pairs of proper fractions, writing the answer in its simplest form [for example,  $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ ]
- ▶ divide proper fractions by whole numbers [for example,  $\frac{1}{3} \div 2 = \frac{1}{6}$ ]
- ▶ associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example,  $\frac{3}{8}$ ]
- ▶ 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
- ▶ 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.

## Ratio and Proportion

- ▶ 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 use 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

## Algebra

- ▶ use simple formulae
- ▶ generate and describe linear number sequences
- ▶ express missing number problems algebraically
- ▶ find pairs of numbers that satisfy number sentences involving two unknowns
- ▶ enumerate possibilities of combinations of two variables

## Measurement

- ▶ 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 up to three decimal places
- ▶ convert between miles and kilometres
- ▶ recognise that shapes with the same areas can have different perimeters and vice versa
- ▶ recognise when it is possible to use the 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 ( $\text{cm}^3$ ) and cubic metres ( $\text{m}^3$ ), and extending to other units [for example,  $\text{mm}^3$  and  $\text{km}^3$ ]

## Geometry - properties of shapes

- ▶ draw 2-D shapes using given dimensions and angles
- ▶ recognise, describe and build simple 3-D shapes including making nets
- ▶ compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
- ▶ illustrate and name parts of circle, including radius, diameter and circumference and know that the diameter is twice the radius
- ▶ recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

## Geometry - position and direction

- ▶ describe positions on the full coordinate grid (all four quadrants)
- ▶ draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

## Statistics

- ▶ interpret and construct pie charts and line graphs and use these to solve problems
- ▶ calculate and interpret the mean as an average