Key Learning in Mathematics – Year 5

Number – number and place value

- Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
- *Count forwards and backwards in decimal steps*
- Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
- Read, write, order and compare numbers with up to 3 decimal places
- *Identify the value of each digit to three decimal places*
- *Identify represent and estimate numbers using the number line*
- *Find 0.01, 0.1, 1, 10, 100, 100 and other powers of 10 more or less than a given number*
- Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- Round decimals with two decimal places to the nearest whole number and to one decimal place
- Multiply/divide whole numbers and decimals by 10, 100 and 1000
- Interpret negative numbers in context, count on and back with positive and negative whole numbers, including through zero
- *Describe and extend number sequences including those with multiplication/division steps and where the step size is a decimal*
- Read Roman numerals to 1000 (M); recognise years written as such
- Solve number and practical problems that involve all of the above

Number – fractions, decimals and percentages

- Recognise mixed numbers and improper fractions and convert from one form to the other
- Read and write decimal numbers as fractions (e.g. 0.71 = $\frac{71}{100}$)
- *Count on and back in mixed number steps such as* $1\frac{1}{2}$
- Compare and order fractions whose denominators are all multiples of the same number *(including on a number line)*
- Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- Add and subtract fractions with denominators that are the same and that are multiples of the same number *(using diagrams)*
- Write statements > 1 as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)
- Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- 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 involving fractions and decimals to three places*
- 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 fractions with a denominator of a multiple of 10 or 25

Number – addition and subtraction

- *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)*
- *Select a mental strategy appropriate for the numbers involved in the calculation*
- *Recall and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place)*
- *Derive and use addition and subtraction facts for 1 (with decimal numbers to two decimal places)*
- Add and subtract numbers mentally with increasingly large numbers *and decimals to two decimal places*
- Add and subtract whole numbers with more than 4 digits *and decimals with two decimal places,* including using formal written methods (columnar addition and subtraction)
- 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
- *Solve addition and subtraction problems involving missing numbers*

Geometry – properties of shapes

- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles
- Use the properties of rectangles to deduce related facts and find missing lengths and angles
- Identify 3-D shapes 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 (°)
- Identify:
  - angles at a point and one whole turn (total 360°)
  - angles at a point on a straight line and half a turn (total 180°)
  - other multiples of 90°

Geometry – position and direction

- *Describe positions on the first quadrant of a coordinate grid*
- *Plot specified points and complete shapes*
- 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

- *Complete and interpret information in a variety of sorting diagrams (including those used to sort properties of numbers and shapes)*
- Complete, read and interpret information in tables and timetables
- Solve comparison, sum and difference problems using information presented in *all types of graph including* a line graph
- *Calculate and interpret the mode, median and range*

Number – multiplication and division

- *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)*
- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two 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
- Recognise and use square (^{2}) and cube (^{3}) numbers, and notation
- *Use partitioning to double or halve any number, including decimals to two decimal places*
- Multiply and divide numbers mentally drawing upon known facts
- Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- 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
- 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
- *Use estimation/inverse to check answers to calculations; determine, in the context of a problem, an appropriate degree of accuracy*
- 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

Measurement

- *Use, read and write standard units of length and mass*
- Estimate *(and calculate)* volume ((e.g., using 1 cm^3 blocks to build cuboids (including cubes)) and capacity (e.g. using water)
- *Understand the difference between liquid volume and solid volume*
- *Continue to order temperatures including those below 0°C*
- Convert between different units of metric measure
- Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
- Measure/calculate the perimeter of composite rectilinear shapes
- Calculate and compare the area of rectangle, use standard units square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes
- *Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks*
- Solve problems involving converting between units of time
- Use all four operations to solve problems involving measure using decimal notation, including scaling