Numeracy Objectives – 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
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
- 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.

Number – addition and subtraction

- solve addition and subtraction **multi-step** problems in contexts, deciding which operations and methods to use and why (including decimals)
- Complements of decimals to one whole
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- (brackets?)
- add and subtract whole numbers with more than 4 digits, (and decimals with up to 3 dp) including using formal written methods (columnar addition and subtraction)
- **add and subtract numbers mentally with increasingly large numbers**

Number – multiplication and division

- 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**.
- **establish whether a number up to 100 is prime and recall prime numbers up to 19**
- 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**
- recognise and use square numbers **and cube numbers**, and the **notation for** squared (^{2}) and **cubed (^{3})**
- multiply numbers **up to 4 digits** by a one- or two-digit number using a formal written method, (including grid) 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
- Express remainders in different ways e.g. 98÷4= 98/4=24r2=24½=24.5~25
- Use mental arithmetic strategies when appropriate, e.g. partitioning, chunking and jottings
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

Number – fractions

- 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, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]
- 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
- 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 plus FDP equivalence.

identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths

- read, write, order and compare numbers with up to three decimal places
- round decimals with two decimal places to the nearest whole number and to one decimal place
- compare and order fractions whose denominators are all multiples of the same number
- add and subtract fractions with the same denominator and denominators that are multiples of the same number

Geometry – properties of shapes

- identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- distinguish between regular and irregular polygons based on reasoning about equal sides and angles.
- 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 – prev Y4 - (total 360°)
  - angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°)
  - other multiples of 90°
- use the properties of rectangles to deduce related facts and find missing lengths and angles

- multiply and divide whole numbers and decimals numbers by 10 and 100, giving answers up to two decimal places
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- solve problems involving number up to three decimal places
- Find fractions and percentages of amounts

solve problems which require knowing percentage and decimal equivs. of $\frac{1}{2}$, $\frac{1}{4}$, ¾ $\frac{1}{5}$, $\frac{2}{5}$, 3/5, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.

Ratio and proportion

- Solve simple problems involving similar shapes where the scale factor is known or can be found.
- Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. e.g. In a class there are 30 children. For every 3 boys there are 2 girls. How many boys in the class? Problems e.g. altering a recipe from 2 – 6 people e.g. 1 egg, 3 spoons of flour – 3 eggs, 9 spoons of flour.
- solve problems involving the calculation of percentages 10% 25% 50% 75% 40% etc

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.
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Statistics

complete, read and interpret information in tables, including timetables.

- solve comparison, sum and difference problems using information presented in a line graph

Algebra

- Extended balance and missing number puzzles
- Counting and describing non-linear sequences eg square and triangular numbers…Fibonacci
- Line graphs in 4 quadrants, including finding co-ordinates of a line given the 'rule', position to term
- Problem solving with line graphs and sequences

Measurement

use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

- 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 including using the relations of perimeter to find unknown lengths in centimetres and metres
- calculate and compare the area of rectangles (including squares) including using the relations of area to find unknown lengths,, and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes
- calculate the area from scale drawings using given measurements
- estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water
- read, write and convert time between analogue and digital 12- and 24-hour clocks
- solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.
- solve problems involving converting between units of time