

Problem Solving \& Reasoning

## Number - number and place value

Count from 0 in multiples of 4, 8, 50 and 100

- Count up and down in tenths
- Read and write numbers up to 1000 in numerals and in words
- Read and write numbers with one decimal place
- Identify, represent and estimate numbers using different representations (including the number line)
- Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)
Identify the value of each digit to one decimal place
- Partition numbers in different ways (e.g. $146=100+$ $40+6$ and $146=130+16$ )
- Compare and order numbers up to 1000
- Compare and order numbers with one decimal place
- Find 1,10 or 100 more or less than a given number
- Round numbers to at least 1000 to the nearest 10 or 100
- Find the effect of multiplying a one- or two-digit number by 10 and 100, identify the value of the digits in the answer
- Describe and extend number sequences involving counting on or back in different steps
- Read Roman numerals from I to XII
- Solve number problems and practical problems involving these ideas


## Number - fractions

- Show practically or pictorially that a fraction is one whole number divided by another (e.g. $\frac{3}{4}$ can be interpreted as $3 \div 4$ )
- Understand that finding a fraction of an amount relates to division
- Recognise that tenths arise from dividing objects into 10 equal parts and in dividing one-digit numbers or quantities by 10
- Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
- Recognise and use fractions as numbers: unit fractions and non unit fractions with small denominators
- Recognise and show, using diagrams, equivalent fractions with small denominators
- Add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7}+\frac{1}{7}=\frac{6}{7}$ ]
- Compare and order unit fractions, and fractions with the same denominators (including on a number line)
- Count on and back in steps of $\frac{1}{2}, \frac{1}{4}$ and $\frac{1}{3}$
- Solve problems that involve all of the above


## 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
- Understand and use take away and difference for subtraction deciding on the most efficient method for the numbers involved, irrespective of context
- Recall/use addition/subtraction facts for 100 (multiples of 5 and 10)
- Derive and use addition and subtraction facts for 100
- Derive and use addition and subtraction facts for multiples of 100 totalling 1000
- Add and subtract numbers mentally, including

> a three-digit number and ones
a three-digit number and tens
a three-digit number and hundreds

- Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction


## Geometry - properties of shapes

- Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them - Recognise angles as a property of shape or a description of a turn
- Identify right angles, recognise that two right angles make a half-turn three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle
- Identify horizontal and vertical lines and pairs of perpendicular and parallel lines

Geometry - position and direction

- Describe positions on a square grid labelled with letters and numbers


## Statistics

- Use sorting diagrams to compare and sort objects, numbers and common 2-D and 3-D shapes and everyday objects
- Interpret and present data using bar charts, pictograms and tables
- Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables

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)
- Understand that division is the inverse of multiplication and vice versa
- Understand how multiplication and division statements can be represented using arrays
- Understand division as sharing and grouping and use each appropriately
- Recall and use multiplication and division facts for the 3,4 and 8 multiplication tables
- Derive and use doubles of all numbers to 100 and corresponding halves - Derive and use doubles of all multiples of 50 to 500
- Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
- Solve problems, including missing number problems, involving multiplication and division (and interpreting remainders), including positive integer scaling problems and correspondence problems in which n objects are connected to m objects


## Measures

- Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (1/ml)
- Continue to estimate and measure temperature to the nearest degree $\left({ }^{\circ} \mathrm{C}\right)$ using thermometers
- Understand perimeter is a measure of distance around the boundary of a shape
- Measure the perimeter of simple 2-D shapes
- Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks
- Estimate/read time with increasing accuracy to the nearest minute
- Record/compare time in terms of seconds, minutes, hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon, midnight
- Know the number of seconds in a minute and the number of days in each month, year and leap year
- Compare durations of events [for example to calculate the time taken by particular events or tasks]
- Continue to recognise and use the symbols for pounds ( $£$ ) and pence (p) and understand that the decimal point separates pounds/pence
- Recognise that ten 10 p coins equal $£ 1$ and that each coin is $\frac{1}{10}$ of $£ 1$
- Add and subtract amounts of money to give change, using both $£$ and $p$ in practical contexts
- Solve problems involving money and measures and simple problems involving passage of time

