

Mathematics – Progression Map

Counting

Calculating

Visualising

Estimating

Communicating

Reasoning

Problem Solving

Thinking Mathematically
Daily Routines :

Number and Place Value

- count in multiples of 6, 7, 9, 25 and 1000
- find 1000 more or less than a given number
- count backwards through zero to include negative numbers
- recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and units)
- order and compare numbers beyond 1000
- identify, represent and estimate numbers using different representations
- round any number to the nearest 10, 100 or 1000
- solve number and practical problems that involve all of the above and with increasingly large numbers
- read Roman numerals to 100 (I to C) and know that over time, the numeral system changed and the concept of zero and place value.

Addition and Subtraction

- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- estimate and use inverse operations to check answers to a calculation
- solve addition and subtraction two-step problems in contexts, deciding which operations and order of operations to use and why.

Geometry (properties of shapes)

- compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes
- identify acute and obtuse angles and compare and order angles up to two right angles by size
- identify lines of symmetry in 2-D shapes presented in different orientations
- complete a simple symmetric figure with respect to a specific line of symmetry.

Measures

- Convert between different units of measure [for example, kilometre to metre; hour to minutes; minutes to seconds; grams to kilograms; litres to millilitres]
- measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres
- find the area of rectilinear shapes by counting squares
- estimate, compare and calculate different measures, including money in pounds and pence
- 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; months to weeks; weeks to days.

Half Term

Counting

Calculating

Visualising

Thinking Mathematically
Daily Routines :

Multiplication and Division

- recall multiplication and division facts for multiplication tables up to 12 × 12
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 10 and 100; multiplying by 1000; dividing by 10 and 100; dividing by 1000; multiplying together three numbers
- recognise and use factor pairs and commutativity in mental calculations
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding, including using the distributive law to multiply a number by a sum of two numbers; integer scaling problems and harder correspondence problems such as 150 people at 12 tables are connected to m objects.

Fractions

- recognise and show, using diagrams, families of common equivalent fractions
- count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by ten.
- solve problems involving increasingly harder fractions to calculate quantities, and fractions

Non-Statutory Guidance

Number and Place Value	<p>Using a variety of representations, including measures, and place value of numbers beyond 1000, including continuing to maintain fluency in other multiples through varied and frequent practice.</p> <p>They begin to extend their knowledge of the number system to include numbers and fractions that they have met so far.</p> <p>They connect estimation and rounding numbers to the real world.</p> <p>Roman numerals should be put in their historical context. There have been different ways to write whole numbers and the introduction of zero and place value were introduced over a period of time.</p>
Addition and Subtraction	<p>Pupils continue to practise both mental methods and written methods with increasingly large numbers to aid fluency (see Mathematics Appendix 1).</p>
Multiplication and Division	<p>Pupils continue to practise recalling and using multiplication facts to aid fluency.</p> <p>Pupils practise mental methods and extend this to three-digit numbers (for example $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$).</p> <p>Pupils practise to become fluent in the formal written method for short division with exact answers (see Mathematics Appendix 2).</p> <p>Pupils write statements about the equality of expressions using the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $2 \times (6 \times 5) = (2 \times 6) \times 5$.</p> <p>They combine their knowledge of number facts and rules to solve problems and written calculations for example, $2 \times 6 \times 5 = 10 \times 6$.</p> <p>Pupils solve two-step problems in contexts, choosing the most appropriate method with increasingly harder numbers. This should include problems such as the numbers of choices of a meal on a menu, or three times as many as 10 children.</p>
Fractions	<p>Pupils should connect hundredths to tenths and place value.</p> <p>They extend the use of the number line to connect fractions.</p> <p>Pupils understand the relation between non-unit fractions and the whole of quantities, with particular emphasis on tenths and hundredths.</p> <p>Pupils make connections between fractions of a length, area, volume, mass, time, temperature, representation of one whole or set of quantities. Pupils should be able to recognise equivalent fractions and simplify where appropriate (for example $\frac{2}{4} = \frac{1}{2}$ and $\frac{4}{8} = \frac{1}{2}$).</p> <p>Pupils continue to practise adding and subtracting fractions to become fluent through a variety of increasingly complex problems.</p> <p>Pupils are taught throughout that decimals and fractions are different representations of the same numbers and proportions.</p> <p>Pupils' understanding of the number system and decimal notation extends to tenths and then hundredths. This includes recognising that dividing by 10 is the same as multiplying by $\frac{1}{10}$ and division of whole number by 10 and later 100.</p> <p>They practise counting using simple fractions and decimals forwards and backwards.</p> <p>Pupils learn decimal notation and the language associated with it in the context of measurements. They make comparisons and calculations with quantities that are expressed to the same number of decimal places. They are able to represent numbers with one or two decimal places on a number line.</p>
Measures	<p>Pupils build on their understanding of place value and units of measurement, including money.</p> <p>They use multiplication to convert from larger to smaller units (for example, 1000g to 1kg).</p> <p>They use division to convert from smaller to larger units (for example, 1kg to 1000g).</p>