



## Year 6 Spring 1

### Starter suggestions for Number

- Know by heart facts for all multiplication tables up to 12 x 12.
- Find pairs of numbers with a sum of 100, decimals with a sum of 0.1, 1, 10.
- To derive related facts from those already known (e.g.  $4 \times 0.8$  linked to  $4 \times 8$  or  $3 + 7 = 10$  linked to  $0.3 + 0.7 = 1$ ).
- Mentally multiply and divide two-digit and single-digit numbers.
- Use partitioning to double or halve any number.
- Mentally multiply and divide pairs of multiples of 10 and 100.
- Mentally multiply and divide two-digit decimals by a single digit number, e.g.,  $(U.t \times U$  or  $U.t \div U)$ .
- Identify the multiples/factors of given numbers.
- Read and write any integer and use decimal notation for tenths, hundredths and thousandths and know what each digit represents.
- Compare and order two or more different positive and/or negative integers and/or decimal numbers with up to 3 decimal places, say which is the least / greatest ;use the symbols  $<$ ,  $>$  and  $=$  correctly and place on a number line.
- Calculate differences in temperature, including those that involve a positive and negative temperature.
- Count forwards and backwards in steps of 0.001, 0.01, 0.1, 1, 10, 100, 1000, 25, 2.5, 0.2, 0.25 from any positive or negative integer or decimal.
- Recall and use addition and subtraction facts for 1 (with decimal numbers to two decimal places).
- Multiply and divide whole numbers and decimals mentally by 10 or 100, and integers by 1000 and use this to convert between units of measurement, e.g. cm to m, g to kg etc.
- Round whole numbers to the nearest 10, 100, 1000 or a number with up to three decimal places to the nearest integer or number of decimal places.
- Count in fraction steps (e.g. of  $\frac{1}{12}$ , i.e.  $\frac{1}{12}, \frac{1}{6}, \frac{1}{4}, \frac{1}{3}, \frac{5}{12}, \frac{1}{2}$ ).

### Starter suggestions for Measurement, Geometry and Statistics

- Know and use standard metric units of measure.
- Estimate and calculate length (including perimeter), mass, volume/capacity and area.
- Convert between units by multiplying and dividing by powers of 10.
- Know metric and imperial equivalences of feet, inches, pints and pounds.
- Read, write and convert between units of time.
- Identify and describe properties of 2-D and 3-D shapes, including regular and irregular.
- Find missing angles and lengths using properties of shape.
- Estimate and identify acute, obtuse and reflex angles.
- Describe positions on the first quadrant of a coordinate grid.
- Solve comparison, sum and difference problems using information presented in all types of graph.
- Continue to complete and interpret information in a variety of sorting diagrams (including those used to sort properties of numbers and shapes).

	Main learning	Rationale
<b>Week 1</b> Place value, sequences and coordinates	<ul style="list-style-type: none"> <li>Count forwards or backwards in steps of integers, decimals or powers of 10 for any number.</li> <li>Describe and extend number sequences including those with multiplication and division steps, inconsistent steps, alternating steps and those where the step size is a decimal.</li> <li>Use simple formulae.</li> <li>Generate and describe linear number sequences.</li> <li>Describe positions on the full coordinate grid (all four quadrants).</li> </ul>	Children link counting in steps of different size to sequences and describe and generate formulae for these sequences. A linear number sequence is one that increases or decreases by the same amount each time. The generalising of sequences is then related to the coordinate grid, where children recognise the values of the vertical and horizontal lines. They apply their knowledge of negative numbers to the second, third and fourth quadrants.
<b>Week 2</b> 2-D shape, coordinates, translation and reflection	<ul style="list-style-type: none"> <li>Describe positions on the full coordinate grid (all four quadrants).</li> <li>Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</li> </ul>	Children combine their understanding of shapes and coordinates. When identifying the coordinates of missing vertices of shapes, the coordinate grid should be on plain paper, so children are applying their knowledge of shapes, rather than simply counting squares. When reflecting and translating shapes, children should identify relationships between coordinates of the vertices and use these relationships when identifying and checking the coordinates of the transformed shape.
<b>Week 3</b> Measurement (temperature) and statistics (mean)	<ul style="list-style-type: none"> <li>Use negative numbers in context, and calculate intervals across zero.</li> <li>Order and compare numbers including integers, decimals and negative numbers.</li> <li>Calculate and interpret the mean as an average.</li> </ul>	Children use and calculate with negative numbers using the context of temperature (as it is often very cold at this time of year). When ordering numbers from a set of data, they can be introduced to averages. The median could be found once the numbers have been ordered, then leading on to finding the mean, consolidating their addition and division skills.



	Main learning	Rationale
<b>Week 4</b> <b>Calculating with fractions</b>	<ul style="list-style-type: none"> <li>Identify common factors, common multiples and prime numbers.</li> <li>Use common factors to simplify fractions; use common multiples to express fractions in the same denominator.</li> <li>Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.</li> <li>Multiply simple pairs of proper fractions (<i>using diagram</i>), writing the answer in its simplest form (e.g. <math>\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}</math>).</li> <li>Divide proper fractions by whole numbers (<i>using diagram</i>) (e.g. <math>\frac{1}{3} \div 2 = \frac{1}{6}</math>).</li> <li>Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. <math>\frac{3}{8}</math>).</li> </ul>	<p>Children use knowledge of multiplication facts to identify factors and multiples of different numbers. In doing so, they can learn that prime numbers are ones whose only factors are themselves and 1.</p> <p>Children apply their knowledge of common factors to create equivalent fractions in order to compare, order and position on a number line.</p> <p>Children apply their knowledge of common multiples in order to add and subtract fractions with different denominators, by converting to equivalent fractions.</p> <p>When multiplying and dividing fractions, it is essential that children use diagrams and knowledge of multiplication and division of whole numbers to understand the concept of calculating with fractions.</p> <p>Children recognise that fractions, decimals and percentages are all ways of expressing a proportion. Decimals (decimal fractions) are ways of writing fractions in our Base 10 number system, so converting to tenths, hundredths and thousandths is essential understanding.</p>
<b>Week 5</b> <b>Mental and written division</b>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>Use written division methods in cases where the answer has up to two decimal places.</li> <li><i>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</i></li> <li>Solve problems which require answers to be rounded to specified degrees of accuracy.</li> </ul>	<p>Children learn when it is appropriate to use mental and written methods of calculation.</p> <p>Children make links with their knowledge of rounding numbers to estimate the answers to calculations. Calculations should be in contexts including, money, measures, real life problems and number enquiries.</p> <p>Children should also explore missing number problems using algebraic notation, including pairs of numbers to satisfy and equation with two unknowns and generalising the relationship between the two numbers.</p> <p>Written methods should be agreed by the school and shared in the progression in written calculations policy. Efficient written methods are required to be taught by the end of Key Stage 2.</p>
<b>Week 6</b> <b>Mental and written multiplication</b>	<ul style="list-style-type: none"> <li>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.</li> <li>Multiply one-digit numbers with up to two decimal places by whole numbers.</li> <li><i>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</i></li> <li><i>Select a mental strategy appropriate for the numbers involved in the calculation.</i></li> <li>Solve problems which require answers to be rounded to specified degrees of accuracy.</li> <li>Enumerate possibilities of combinations of two variables.</li> </ul>	<p>Children learn when it is appropriate to use mental and written methods of calculation.</p> <p>Children make links with their knowledge of rounding numbers to estimate the answers to calculations. Calculations should be in contexts including, money, measures, real life problems and number enquiries.</p> <p>Children should also explore missing number problems using algebraic notation, including pairs of numbers to satisfy and equation with two unknowns and generalising the relationship between the two numbers.</p> <p>Children should explore finding all possibilities problems when there are two variables e.g. using the two variables of colour and parts of a house, how many different houses are possible if the walls, roof and door can be either red, blue or yellow. When all combinations have been found, then the children should identify and generalise about the number of combinations and the choices for each variable.</p> <p>Written methods should be agreed by the school and shared in the progression in written calculations policy. Efficient written methods are required to be taught by the end of Key Stage 2.</p>