



## Year 6 Autumn 2

### Starter suggestions for Number

- Know by heart facts for all multiplication tables up to  $12 \times 12$ .
- 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.,  $(U.t \times U \text{ or } U.t \div U)$ .
- Read and write any integer and use decimal notation for tenths, hundredths and thousandths and know what each digit represents.
- Order and compare whole numbers up to 1 000 000, negative numbers and decimals.
- 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 and convert equivalent fractions (e.g. count in steps of  $\frac{1}{12}$  converting to  $\frac{1}{12}, \frac{1}{6}, \frac{1}{4}, \frac{1}{3}, \frac{5}{12}, \frac{1}{2}, \dots$ ).

### 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 2D and 3D 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> Fractions	<ul style="list-style-type: none"> <li>Identify common factors, common multiples and prime numbers.</li> <li>Compare and order fractions, including fractions <math>&gt;1</math> (including on a number line).</li> <li>Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.</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> <li>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</li> <li>Solve problems involving fractions.</li> </ul>	<p>Children use knowledge of multiplication facts to identify factors and multiples of different numbers. In doing so, children can learn that prime numbers are ones whose only factors are themselves and 1. Prime numbers up to 100 can be derived using the Sieve of Eratosthenes.</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 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 2</b> Fractions, percentages, ratio and proportion	<ul style="list-style-type: none"> <li>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</li> <li>Find simple percentages of amounts.</li> <li>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.</li> <li>Solve problems involving the calculation of percentages (for example, of measures, and such as 15% of 360) and the use of percentages for comparison.</li> <li>Solve problems involving similar shapes where the scale factor is known or can be found.</li> <li>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</li> </ul>	<p>Children learn that percentage is a way of expressing a proportion as a fraction of 100. Links are made between scaling up or down to create fractions with a denominator that is 100. Links are also made between the equivalence that 10% is the same as <math>\frac{1}{10}</math> and that to find <math>\frac{1}{10}</math> of an amount you divide by 10. From finding 10%, other amounts can be found such as 5%, 40% etc.</p> <p>Children also learn how to share in unequal amounts by using ratios. Ratio can also be understood as comparing part to part. This can be applied to scaling up and down to draw similar shapes according to a given ratio.</p>
<b>Week 3</b> Geometry (angles) and statistics (pie charts)	<ul style="list-style-type: none"> <li>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</li> <li>Interpret and construct pie charts and line graphs and use these to solve problems.</li> <li>Solve comparison, sum and difference problems using information presented in all types of graph.</li> </ul>	<p>Children's work on angles is extended to applying the understanding of relationships between different ones in order to calculate missing angles on a straight line (total <math>180^\circ</math>), around a point (total <math>360^\circ</math>) and that vertically opposite angles are equal.</p> <p>The knowledge of angles around a point is then combined with knowledge of percentages when constructing pie charts. Children become familiar with pie charts, understanding the purpose of presenting data in this way and solving problems by interpreting data in different presentations.</p>



	Main learning	Rationale
<b>Week 4</b> <b>Measurement</b> <b>(length, perimeter and mass)</b>	<ul style="list-style-type: none"> <li>▪ Solve problems involving the calculation and conversion of units of measure (including money and time), using decimal notation up to three decimal places where appropriate.</li> <li>▪ Use, read, write and convert between standard units, converting measurements of length and mass, from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places.</li> <li>▪ Convert between miles and kilometres.</li> </ul>	<p>Children apply their understanding of the Base 10 number system and multiplying and dividing by powers of 10 in order to convert between units of measurement for length and mass.</p> <p>The learning of measurement should be practically based, and perimeter should be included in the learning of length as it is a measure of distance.</p> <p>Children are also introduced to the relationship between miles and kilometres i.e. that 8km is roughly equivalent to 5 miles, and use this to convert between these two units.</p>
<b>Week 5</b> <b>Measurement</b> <b>(area and volume)</b>	<ul style="list-style-type: none"> <li>▪ Recognise that shapes with the same areas can have different perimeters and vice versa.</li> <li>▪ Calculate the area of parallelograms and triangles.</li> <li>▪ Use, read and write standard units using decimal notation to up to three decimal places.</li> <li>▪ Recognise when it is possible to use the formulae for area and volume of shapes.</li> <li>▪ Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (<math>\text{cm}^3</math>) and cubic metres (<math>\text{m}^3</math>) and extending to other units (for example, <math>\text{mm}^3</math> and <math>\text{km}^3</math>).</li> </ul>	<p>The work on perimeter from the previous week can be followed up by investigating shapes with the same perimeter having different areas and vice versa.</p> <p>Children learn how to find the area of triangles and parallelograms by relating their knowledge of finding the area of rectangles. Area of a triangle should be understood by children as <math>\frac{1}{2}</math> (base x height). Area of a parallelogram should be related to area of a rectangle, with children cutting a parallelogram to create a rectangle.</p> <p>Children should learn and understand the formula for finding the area of these 2D shapes, and then relate this to finding the volume of prisms, including cubes and cuboids.</p>
<b>Week 6</b> <b>Assess and review</b>	Assess and review week	<p>It is useful at regular intervals for teachers to consider the learning that has taken place over a term (or half term), assess and review children's understanding of the learning and use this to inform where the children need to go next.</p>