



## Year 6 Programme of Study for Mathematics

- The topics in this document should be taught in the order that they are written.
- All objectives should be taught through problem solving and encourage the development of reasoning and fluency.
- Please refer to the other planning documents for further guidance.
- Use the last week of each half term for addressing misconceptions and assessment.
- By the end of each half term, the children should have a firm understanding of the objectives highlighted in red.
- **Every lesson should include 10-15 minutes of daily arithmetic – focusing on previous learning, key number facts for the year group and the developing of conceptual understanding through the discussion of related examples.**

### Daily Arithmetic

Each maths lesson should start with daily arithmetic. The focus of this time must be mental strategies and revision of learning already covered. This session should be quick and focused with discussion over strategies used. Maximum of 15 minutes before the main teaching session begins. Refer to examples in the maths folder.

### Daily Ten

At the end of each day, children should be practising use key mental strategies using Daily Ten on Topmarks.

Mastery Checker		
Taught in the context of number through problem solving over the year	Calculation problems	<ul style="list-style-type: none"><li>• use their knowledge of the order of operations to carry out calculations involving the four operations</li><li>• express missing number problems algebraically</li><li>• solve problems involving addition, subtraction, multiplication and division</li><li>• use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy</li></ul>
	Proportion problems	<ul style="list-style-type: none"><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 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>



<b>1<sup>st</sup> Half of Autumn term</b>	<b>Integers (2 weeks)</b>	<ul style="list-style-type: none"> <li>• read, write, order and compare numbers up to 10 000 000 and determine the value of each digit</li> <li>• round any whole number to a required degree of accuracy</li> <li>• solve problems involving addition and subtraction</li> <li>• generate and describe linear number sequences</li> <li>• solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</li> </ul>
	<b>Multiplication and Division (4 weeks)</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>• 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 calculate and interpret the mean as an average</li> <li>• identify common factors, common multiples and prime numbers</li> <li>• perform mental calculations, including with mixed operations and large numbers</li> <li>• express missing number problems algebraically</li> <li>• find pairs of numbers that satisfy an equation with two unknowns</li> <li>• solve problems which require answers to be rounded to specified degrees of accuracy</li> </ul>
	<b>Assessment and addressing misconceptions (1 week)</b>	Assess at the beginning of the week then plan to address misconceptions for the remainder of the sessions.

<b>2<sup>nd</sup> Half of Autumn term</b>	<b>Week of Inspirational Maths / Problem solving week</b>	Use Youcubed website/NRich to begin half term focusing on these areas: <ul style="list-style-type: none"> <li>• Problem solving, reasoning, fluency</li> <li>• Mindset in Maths</li> </ul>
	<b>Fractions (5 weeks)</b>	<ul style="list-style-type: none"> <li>• use common factors to simplify fractions; use common multiples to express fractions in the same denomination</li> <li>• compare and order fractions, including fractions &gt; 1</li> <li>• generate and describe linear number sequences (with fractions)</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, writing the answer in its simplest form [for example, <math>\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}</math>]</li> <li>• divide proper fractions by whole numbers [for example, <math>\frac{1}{3} \div 2 = \frac{1}{6}</math>]</li> <li>• associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, <math>\frac{3}{8}</math>]</li> <li>• recall and use equivalences between simple fractions and decimals, including in different contexts know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers</li> </ul>
	<b>Assessment and addressing misconceptions (1 week)</b>	Assess at the beginning of the week then plan to address misconceptions for the remainder of the sessions.



<b>1<sup>st</sup> Half of Spring term</b>	<b>Decimals and measure (2 weeks)</b>	<ul style="list-style-type: none"> <li>• identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places</li> <li>• solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate</li> <li>• use, read, write and convert between standard units, converting measurements of length, mass, volume and time 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> <li>• recognise that shapes with the same areas can have different perimeters and vice versa</li> <li>• recognise when it is possible to use formulae for area and volume of shapes</li> <li>• use simple formulae</li> <li>• calculate the area of parallelograms and triangles</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>
	<b>Percentages and pie charts (2 week)</b>	<ul style="list-style-type: none"> <li>• recall and use equivalences between simple fractions, decimals and percentages, including in different contexts</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>• interpret and construct pie charts and line graphs and use these to solve problems</li> </ul>
	<b>Assessment and addressing misconceptions (1 week)</b>	Assess at the beginning of the week then plan to address misconceptions for the remainder of the sessions.

<b>2<sup>nd</sup> Half of Spring term</b>	<b>Co-ordinates and shape (2 weeks)</b>	<ul style="list-style-type: none"> <li>• use negative numbers in context, and calculate intervals across zero</li> <li>• describe positions on the full coordinate grid (all four quadrants)</li> <li>• enumerate possibilities of combinations of two variables</li> <li>• draw 2-D shapes using given dimensions and angles</li> <li>• draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</li> <li>• recognise, describe and build simple 3-D shapes, including making nets</li> <li>• illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius</li> <li>• solve number and practical problems that involve all of the above</li> </ul>
	<b>Missing lengths and angles (2 week)</b>	<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>• express missing number problems algebraically</li> <li>• compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons</li> </ul>
	<b>Assessment and addressing misconceptions (1 week)</b>	Assess at the beginning of the week then plan to address misconceptions for the remainder of the sessions.

