

## Year 6 – Small steps objective coverage

### **AUTUMN TERM – YEAR 6**

#### **Place value within 100,000 and 1,000 000**

To read and write numbers to 1,000,000 fluently and identify their place value.  
 To read and write numbers to 10,000,000 fluently and identify their place value.  
 To use understanding of place value and numbers up to 10,000,000 to partition numbers and solve problems in real-life contexts.  
 To accurately identify and estimate where numbers up to 10,000,000 lie on a number line.  
 To use understanding of place value and numbers up to 10,000,000 to compare and order numbers.  
 To use understanding of place value to help them round numbers up to 10,000,000.  
 To learn about negative numbers and their relationship with positive numbers

#### **Number – Four operations**

To develop understanding of the columnar written methods of addition and subtraction where exchanging is not necessary.  
 To develop understanding of the multiplication of 4-digit numbers by 1-digit numbers using multiple representations and methods.  
 To develop understanding of the multiplication of 4-digit numbers by 2-digit numbers using multiple representations and methods.  
 To develop understanding of dividing numbers up to 4 digits by 2-digit numbers using multiple representations and methods.  
 To develop understanding of how 1-digit factors of 2-digit numbers can be used to make the division of numbers with up to 4-digits by 2-digit numbers easier to solve.  
 To learn long division as a method for solving division calculations where short division is less efficient.  
 To use the methods learnt about to solve mathematical problems with real-life contexts.  
 To develop understanding of division with remainders  
 To deepen understanding of remainders and how to represent them.  
 To develop understanding of factors and how common factors link two or more numbers.  
 To develop understanding of multiples and how common multiples link two or more numbers.  
 To recognise and identify prime numbers and explore how these numbers are different from other numbers.  
 To recognise and identify square and cube numbers and explore how these numbers are different from others.  
 To learn the correct order of operations and use this to help solve multi-step calculations.  
 To extend understanding of the order of operations by investigating what effect brackets can have on a calculation.  
 To learn efficient mental methods for solving calculations with smaller numbers, including decimals.  
 To learn efficient mental methods for solving calculations with larger numbers, up to millions.  
 To draw upon their learning to read, understand and solve mathematical puzzles and problems.

#### **Number – Fractions**

To apply knowledge of factors to use common factors to simplify fractions.  
 To extend understanding of simplifying fractions to simplify mixed numbers and improper fractions.  
 To use understanding of fractions to count up and down on a number line, place missing fractions on a number line and find missing numbers in a fractional sequence.  
 To use understanding of fractions to develop their ability to compare and order fractions by making the denominators the same and comparing the numerators.  
 To develop understanding of comparing and ordering mixed numbers and improper fractions by converting between improper fractions and mixed numbers and using a common denominator.  
 To link prior knowledge of finding equivalent fractions with common denominators to adding and subtracting fractions where the answer is between 0 and 1.  
 To understand how to add and subtract mixed numbers where the fractional answer is between 0 and 1 and does not cross the whole.  
 To extend knowledge of adding mixed numbers and fractions by using two methods to add mixed fractions where the fractional answer is greater than 1.  
 To extend understanding of subtracting mixed numbers and fractions to calculations where the fractional answer crosses the whole and they cannot simply subtract the wholes and subtract the parts.

		<p>To extend knowledge of adding and subtracting mixed numbers to solve problems which involve adding and subtracting more than two mixed numbers.</p> <p>To solve more complex problems that involve adding and subtracting mixed numbers and fractions with more than one step.</p>
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## SPRING TERM – YEAR 6

<b><u>Number – Fractions and decimals</u></b>	<b><u>Number – percentages</u></b>	<b><u>Ratio &amp; Proportion</u></b>	<b><u>Measure –</u></b>	<b><u>Measure – area and perimeter</u></b>
<p>To multiply proper and improper fractions and mixed numbers by a whole number.</p> <p>To multiply a fraction by a fraction using visual aids such as divided squares to support understanding.</p> <p>To multiply a fraction by a fraction by multiplying the numerators and multiplying the denominators.</p> <p>To divide unit fractions by a whole number</p> <p>To divide a non unit fraction by a whole number when the numerator is a multiple of the whole number.</p> <p>To divide any fraction by a whole number.</p> <p>To solve fraction problems involving addition, subtraction, multiplication and division using the order of operations and visual aids such as bar models to support their understanding.</p> <p>To find fractions of amounts in various contexts using visual aids such as bar models to solve problems and support their understanding.</p> <p>To solve problems involving finding fractions of amounts, including problems to find the whole given information about a part.</p> <p>To multiply decimals by powers of 10.</p> <p>To divide by powers of 10.</p> <p>To convert decimals to fractions where the denominator is a power of 10 writing the fraction in its simplest form.</p> <p>To convert fractions to decimals.</p> <p>To calculate the decimal equivalents of fractions by drawing on known fraction/decimal equivalents or by dividing the numerator by the denominator.</p> <p>To multiply decimals by whole numbers using known multiplication facts.</p> <p>To multiply a decimal by a whole number where the product requires crossing into the next place up, or where one or both numbers in the multiplication need to be partitioned.</p> <p>To divide decimals by using known multiplication facts and adjusting by powers of 10.</p> <p>To use short division and exchange to divide decimals</p>	<p>To find a percentage of a range of amounts.</p> <p>To learn two methods of finding 20%.</p> <p>To find 1% and then use this to work out multiples of 1%.</p> <p>To find 75% by working out 50% and 25% and then adding them together.</p> <p>To find missing values in problems involving percentages.</p> <p>To use a range of strategies to convert fractions to percentages.</p> <p>To find equivalent fractions, decimals and percentages, and convert between them.</p> <p>To order and compare decimals, percentages and fractions, including those which are greater than 1.</p> <p>To solve a range of problems and puzzles involving fractions, decimals and percentages.</p>	<p>To be introduced to the concept of ratio and proportion.</p> <p>To compare ratios, explore different representations of ratio and identify ratios from given amounts or diagrams.</p> <p>To compare fractions and ratio.</p> <p>To use ratios to deduce quantities.</p> <p>To measure lines on a map or plan and calculate the length in real life.</p> <p>To be provided with measurements and find the scale factor.</p> <p>To learn that for two shapes to be similar they must have the same proportions.</p> <p>To solve problems involving proportion where the scale is not a whole number.</p> <p>To solve a range of problems involving ratio including 2-step problems.</p>	<p>To read, write and recognise all metric measures for length, mass and capacity.</p> <p>To convert between metric units of measurement, including measurements that involve decimals.</p> <p>To solve a range of problems using all four operations in the context of metric measures.</p> <p>To learn the 5:8 ratio between miles and kilometres.</p> <p>To consolidate knowledge of imperial measures, converting between two imperial units and between an imperial and metric unit of measurement.</p>	<p>To find the area of shapes by counting individual squares.</p> <p>To explore simple shapes that have the same area but different perimeters.</p> <p>To explore how shapes with the same perimeter can have different areas.</p> <p>To explore how a parallelogram can be rearranged into a rectangle to derive the formula for calculating the shape's area.</p> <p>To apply knowledge of area to estimate the area of triangles by counting squares and to find the area by rearranging triangles into rectangles.</p> <p>To find the area of right-angled triangles.</p> <p>To apply knowledge of area to calculate the area of any triangle.</p> <p>To apply knowledge of perimeter to solve problems.</p> <p>To calculate the volume of cuboids and explore different shapes with the same volume.</p> <p>To calculate the volume of shapes, using the formula <math>V = l \times w \times h</math>, and find missing dimensions when the volume is given.</p>

## SUMMER TERM – YEAR 6

### **Properties of shape**

To reinforce prior knowledge of angle types and understand how to measure angles using a protractor.

To draw shapes accurately using a ruler and a protractor.

To apply knowledge of accurately drawing shapes and measuring angles to understand that angles in a triangle total  $180^\circ$ .

To extend understanding of angles in a triangle and apply knowledge to calculate missing angles without using a protractor.

To understand how to calculate missing angles in an isosceles triangle given one of the other angles.

To reinforce prior knowledge of properties of shapes and extend learning to understand the interior angles of a quadrilateral sum to  $360^\circ$ .

To develop understanding of the sum of the angles in quadrilaterals and extend this to calculate the sum of the interior angles in other polygons, then use these to find missing angles.

To extend understanding of angles to discover vertically opposite angles are equal.

To understand that as the number of vertices increases an equal distance from the centre, a circle is formed.

To use understanding of properties of 3D shapes to develop their ability to identify shapes from nets and draw nets.

### **Algebra**

To investigate number sequences and identify the algebraic rule that governs them.

To find a rule for a number sequence that has more than one step by represent these sequences in a concrete, pictorial and abstract manner, focusing particularly on the algebraic expressions.

To apply an understanding of algebraic rules and investigate how they can be used to solve and generalise a contextual problem.

To use algebraic rules to find the  $n$ th term in an algebraic sequence.

To create algebraic expressions that generalise the rule in a number sequence.

To find and record algebraic formulae and link these formulae to different real-life contexts and use them to spot patterns.

To read, understand and solve algebraic equations by representing equations in different ways and use these representations to support their reasoning.

To develop the ability to create algebraic equations based on contextual word problems.

To use understanding of creating algebraic equations to create equations they can use to find all solutions to a given problem.

### **Statistics**

To use the mathematical term 'mean' when referring to the average.

To practise calculating the mean using bar models as a visual representation.

To solve problems involving the mean of a group of data.

To compare pie charts to tally charts and bar charts.

To read and interpret pie charts.

To calculate the fractions represented in pie charts.

To use given fractions of a pie chart to calculate the amount/number of items in a category.

To compare and convert percentages of the pie chart to fractions.

To read amounts and times on the line graph and use this to solve problems.

To create and plot more complex line graphs building on skills from Year 5.

### **Geometry – position & direction**

To plot coordinates in the first quadrant.

To plotting coordinates in all four quadrants.

To reflect and translate shapes on a coordinate grid.

To reason about shapes based on their properties.

To solve problems that involve coordinates in all four quadrants.

