Overview of Progression in Year 6

Number and place value

Children work with numbers up to 10,000,000, using knowledge of place value to work out the value of digits. They continue working with negative numbers in different contexts, and work out intervals across zero.

Addition, subtraction, multiplication and division

Children continue to practise using efficient written and mental methods for all four operations, working with larger numbers and increasingly complex calculations, and confidently using number facts from the multiplication and division tables. They learn about the correct order of operations, understanding that (for example) to work out (7 + 8) ÷ 3 they need to tackle the operation in brackets first.

Fractions (including decimals and percentages)

Children begin to add and subtract fractions with different denominators. They multiply pairs of simple proper fractions together, and divide proper fractions by whole numbers.

Children begin to multiply and divide numbers with two decimal places by one-digit and two- digit whole numbers. They are introduced to this in practical contexts such as measures and money (for example, multiplying 1.80 metres by 2, or dividing £1.80 by 3). Children extend their work on percentage and decimal equivalents of fractions, begun in Year 5. They work out simple percentages of whole numbers, and encounter equivalences between fractions, decimals and percentages in different contexts.

Ratio and proportion

In Year 6, children are introduced to the concepts of ratio and proportion and use these to compare quantities and

sizes; for example, understanding that mixing sugar and flour in a ratio of 1:2 means using 1 part of sugar for every 2 parts of flour, and that the proportion of sugar in the mixture is 1 out of 3 parts, which is 1/3.

Algebra

Measurement

Children extend their Year 5 work on calculating area and estimating volume and capacity to calculate the area of parallelograms and triangles, and work out the volume of cubes and cuboids using standard units. They convert measurements from miles to kilometres.

Geometry: properties of shapes

This year, children make nets to build simple 3D shapes, and work out unknown angles in triangles, quadrilaterals and regular polygons. They draw and name the different parts of a circle (radius, diameter and circumference).

Geometry: position and direction

Extending their work with coordinate grids, children learn to describe positions on all four quadrants of the grid, including using negative numbers. They translate simple shapes on the coordinate plan, reflecting them in the axes.

Statistics

Children continue working with line graphs and also learn how to use pie charts, linking this with their work on angles, percentages and fractions. Children learn how to work out the mean of a set of data and understand when it might be appropriate to calculate the mean, and why.

Year 6 Long Term Planning

Number and place value

- Children should use the whole number system - saying, reading and writing numbers accurately.

Fractions (including decimals and percentages)

- Children should practise, use and understand the addition and subtraction of fractions with different denominators by identifying equivalent fractions with the same denominator. They should start with fractions where the denominator of one fraction is a multiple of the other and progress to varied and increasingly complex problems.
- Children should use a variety of images to support their understanding of multiplication with fractions. They should use their understanding of the relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity. They practise with simple fractions and decimal fraction equivalents to aid fluency, including listing equivalent fractions to identify fractions with common denominators.
- Children can explore and make conjectures about converting a simple fraction to a decimal fraction. For simple fractions with recurring decimal equivalents, children should learn about rounding the decimal to three decimal places, or other appropriate approximations depending on the context.
- Children also develop their skills of rounding and estimating as a means of predicting and checking the order of magnitude of their answers to decimal calculations.

Algebra

- Children should be introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as:
  - ☐☐missing numbers, lengths, coordinates and angles
  - ☐☐formulae in mathematics and science
  - ☐☐arithmetical rules (e.g. $a + b = b + a$)
  - ☐☐generalisations of number patterns
  - ☐☐number puzzles

Geometry: properties of shapes

- Children should draw shapes and nets accurately, using measuring tools and conventional markings and labels for lines and angles.
- Children should describe the properties of shapes and explain how unknown angles and lengths

Addition, subtraction, multiplication and division

- Children should practise addition, subtraction, multiplication and division for larger numbers, using the efficient written methods of columnar addition and subtraction, short and long multiplication, and short and long division (see Appendix 1).
- They should undertake mental calculations with increasingly large numbers and more complex calculations.
- Children should continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency.
- Children should round answers to a specified degree of accuracy.
- Children explore the order of operations using brackets.
- Common factors can be related to finding equivalent fractions.

Ratio and proportion

- Pupils recognise proportionality in contexts when the relations between quantities are in the same ratio.
- Pupils link percentages or 360° to calculating angles of pie charts.
- Children should consolidate their understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems. They may use the notation a: b to record their work.
- Children should solve problems involving unequal quantities. These problems are the foundation for later formal approaches to ratio and proportion.

Measurement

- Using the number line, children should use, add and subtract positive and negative integers for measures such as temperature.
- They should know approximate conversions and be able to tell if an answer is sensible.
- They should relate the area of rectangles to parallelograms and triangles, and be able to calculate their areas, understanding and using the formula to do this.
- Children could be introduced to other compound units for speed, such as miles per hour, and apply their knowledge in science or other subjects as appropriate.

Statistics

- Children should connect their work on angles,