**Addition, Subtraction, Multiplication and Division**

Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

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

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

Perform mental calculations, including with mixed operations and large numbers

Identify common factors, common multiples and prime numbers

Use their knowledge of the order of operations to carry out calculations involving the four operations

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Solve problems involving addition, subtraction, multiplication and division

Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).

Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.

Solve problems involving ratio relationships.

**Geometry – Properties of Shape**

Draw 2-D shapes using given dimensions and angles

Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

Recognise, describe and build simple 3-D shapes, including making nets

Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons

Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius

Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

**Ratio and Proportion**

Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts

Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison

Solve problems involving similar shapes where the scale factor is known or can be found

Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

**Number and Place Value**

Read, write, order and compare numbers up to

10 000 000 and determine the value of each digit

Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).

Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.

Round any whole number to a required degree of accuracy

Use negative numbers in context, and calculate intervals across zero

Solve number and practical problems that involve all of the above.

Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.

Divide powers of 10, from 1 hundredh to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.

**recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)**

**round any number to the nearest 10, 100 or 1000**

**solve number and practical problems that involve all of the above and with increasingly large positive numbers**

**read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.**

**Measurement**

Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate

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

Convert between miles and kilometres

Recognise that shapes with the same areas can have different perimeters and vice versa

Recognise when it is possible to use formulae for area and volume of shapes

Calculate the area of parallelograms and triangles

Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3].

**Algebra**

Use simple formulae

Generate and describe linear number sequences

Express missing number problems algebraically

Find pairs of numbers that satisfy an equation with two unknowns

**Statistics**

Interpret and construct pie charts and line graphs and use these to solve problems

Calculate and interpret the mean as an average.

**Geometry – Position and Direction**

Describe positions on the full coordinate grid (all four quadrants)

Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

**Fractions**

**U**se common factors to simplify fractions; use common multiples to express fractions in the same denomination

Recognise when fractions can be simplified,and use common factors to simplify fractions.

Express fractions in a common denomination and use this to compare fractions that are similar in value.

**C**ompare and order fractions, including fractions > 1

Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.

**A**dd and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, 1/4

× ½ = 1/8)

Divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 6)

Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8 ]

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

Solve problems involving number up to three decimal places

Solve problems which require knowing percentage and decimal equivalents of 1/2 ,1/4 ,1/5 ,2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.

Multiply one-digit numbers with up to two decimal places by whole numbers

Use written division methods in cases where the answer has up to two decimal places

Solve problems which require answers to be rounded to specified degrees of accuracy

Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

National Curriculum Year 6