**Measurement**

Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)

Convert between units of measure, including using common decimals and fractions

Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints

Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres

Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes

Compare areas and calculate the area of rectangles (including squares) using standard units.

Estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water]

Solve problems involving converting between units of time

Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

**Addition and Subtraction**

Add and subtract numbers mentally with increasingly large numbers eg 5-digit – 4-digit multiple of 10

Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).

Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)

Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

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

**Geometry – Properties of Shape**

Identify 3-D shapes, including cubes and other cuboids, from 2-D representations

Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles

Draw given angles, and measure them in degrees (o)

Identify:

* angles at a point and one whole turn (total 360o)
* angles at a point on a straight line and ½ a turn (total 180o)
* other multiples of 90o

Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.

Use the properties of rectangles to deduce related facts and find missing lengths and angles

Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

**Geometry – Position and Direction**

Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.

**Statistics**

Solve comparison, sum and difference problems using information presented in a line graph

Complete, read and interpret information in tables, including timetables.

**Multiplication and Division**

Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.

Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers

Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.

Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers

Establish whether a number up to 100 is prime and recall prime numbers up to 19

Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)

Multiply and divide numbers mentally drawing upon known facts

Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.

Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers

Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.

Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.

solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes

solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign

solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

**Fractions**

Recognise the per cent symbol (%) and understand that per cent relates to ‘number of parts per hundred’, and write percentages as a fraction with denominator 100, and as a decimal

Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example,2/5 + 4/5= = 1 1/5

Find non-unit fractions of quantities.

Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths

Find equivalent fractions and understand that they have the same value and the same position in the linear number system.

Compare and order fractions whose denominators are all multiples of the same number

Read and write decimal numbers as fractions [for example, 0.71 = 71/100

Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents

Round decimals with two decimal places to the nearest whole number and to one decimal place

Read, write, order and compare numbers with up to three decimal places

Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning.

Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.

Add and subtract fractions with the same denominator and denominators that are multiples of the same number

Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams

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.

Recall decimal fraction equivalents for , $\frac{1}{2}$ $\frac{1}{4} $ $\frac{1}{5}$

 and $\frac{1}{10}$ and for multiples of these proper fractions.

**Number and Place Value**

Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1.

Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01.

Know that 10 hundredths are that 0.1 is 10imes the size of 0.01.

Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero

Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000

Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit

Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000

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

Read Roman numerals to 1000 (M) and recognise years written in Roman numerals

Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 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.**

National Curriculum Year 5