

Year 5 Programme of Study for Mathematics

Number – number and place value:

- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero
- 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 elements of the place value domain
- read Roman numerals to 1000 (M) and recognise years written in Roman numerals

Number – addition and subtraction:

- add and subtract whole numbers with more than 4 digits, including using efficient written methods (columnar addition and subtraction)
- add and subtract numbers mentally with increasingly large numbers
- 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

Number – multiplication and division:

- identify multiples and factors, including finding all factor pairs
- solve problems involving multiplication and division where larger numbers are used by decomposing them into their 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
- multiply numbers up to 4 digits by a one- or two-digit number using an efficient written method, including long multiplication for two-digit numbers multiply and divide numbers mentally drawing upon known facts
- the efficient written method of short division and interpret remainders appropriately for the context
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- 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

Number – fractions (including decimals):

- compare and order fractions whose denominators are all multiples of the same number
- recognise mixed numbers and improper fractions and convert from one form to the other
- add and subtract fractions with the same denominator and related fractions; write mathematical statements >1 as a mixed number (e.g. $2/5 + 4/5 = 6/5 = 11/5$)
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.
- read and write decimal numbers as fractions (e.g. $0.71 = 71/100$)
- 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
- solve problems involving number up to three decimal places
- 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 hundred, and as a decimal fraction
- solve problems which require knowing percentage and decimal equivalents of $1/2$, $1/4$, $1/5$, $2/5$, $4/5$ and those with a denominator of a multiple of 10 or 25.

Measurement:

- convert between different units of measure (e.g. kilometre and metre; metre and centimetre; centimetre and millimetre; kilogram and gram; litre and millilitre)
- understand and use basic equivalences between metric and common imperial units and express them in approximate terms
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes
- recognise and estimate volume (e.g. using 1 cm³ blocks to build cubes and cuboids) and capacity (e.g. using water)
- solve problems involving converting between units of time solve problems involving addition and subtraction of units of measure (e.g. length, mass, volume, money) using decimal notation.

Geometry:

- identify 3-D shapes, including cubes and cuboids, from 2-D representations
- know angles are measured in degrees; estimate and measure them and draw a given angle, writing its size in degrees (°)
- identify: - multiples of 90°, angles at a point on a straight line and $1/2$ a turn (total 180°), angles at a point and one whole turn (total 360°), reflex angles and compare angles
- draw shapes using given dimensions and angles
- state and use the properties of a rectangle (including squares) to deduce related facts
- distinguish between regular and irregular polygons based on reasoning about equal sides and angles.
- 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 line graphs
- complete, read and interpret information in tables, including timetables.