Maths Milestones

Milestone 1

Number and Place value

1A

-count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number

-count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens

-given a number, identify one more and one less

1B

count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward

Comparing Numbers

1A

use the language of: equal to, more than, less than (fewer), most, least

1B

compare and order numbers from 0 up to 100; use <, > and = signs

Identifying, representing & Estimating Numbers

1A

represent and use number bonds and related subtraction facts within 20

1B

identify, represent and estimate numbers using different representations, including the number line

Addition and Subtraction

1A

represent and use number bonds and related subtraction facts within 20

1B

recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

Mental Calculations

1A

add and subtract one-digit and two-digit numbers to 20, including zero

read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
(appears also in Written Methods)

1B

add and subtract numbers using concrete objects, pictorial representations, and mentally, including:

* a two-digit number and ones
* a two-digit number and tens
* two two-digit numbers
* adding three one-digit numbers

show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot

Written Methods

1A & 1B
read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
(appears also in Mental Calculation)

Inverse operations, estimating and checking answers

1B
recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Problem Solving

1A
solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as
7 = □ - 9
1B
solve problems with addition and subtraction:
*using concrete objects and pictorial representations, including those involving numbers, quantities and measures
*applying their increasing knowledge of mental and written methods
*solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Multiplication and Division facts

1A
count in multiples of twos, fives and tens
1B
count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward
recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

Written Calculations

1B
calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Counting in fractional steps

1B

Pupils should count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)

Recognising fractions

1A

recognise, find and name a half as one of two equal parts of an object, shape or quantity

1B

recognise, find, name and write fractions $^{1}/_{3}$, $^{1}/_{4}$, $^{2}/_{4}$ and $^{3}/_{4}$ of a length, shape, set of objects or quantity

Equivalence

1B

write simple fractions e.g. $^{1}/_{2}$ of 6 = 3 and recognise the equivalence of $^{2}/_{4}$ and $^{1}/_{2}$.

Comparing and Estimating (including Measurement)

1A

compare, describe and solve practical problems for:

* lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half]
* mass/weight [e.g. heavy/light, heavier than, lighter than]
* capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter]
  time [e.g. quicker, slower, earlier, later

sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]

1B

compare and order lengths, mass, volume/capacity and record the results using >, < and =

compare and sequence intervals of time

Measures and calculating

1A

measure and begin to record the following:

* lengths and heights
* mass/weight
* capacity and volume

time (hours, minutes, seconds

recognise and know the value of different denominations of coins and notes

1B

choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels

recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
ind different combinations of coins that equal the same amounts of money

solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Time

1A

tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.

recognise and use language relating to dates, including days of the week, weeks, months and years

1B

tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.

know the number of minutes in an hour and the number of hours in a day.

Identifying shapes and their properties

1A

recognise and name common 2-D and 3-D shapes, including:
* 2-D shapes [e.g. rectangles (including squares), circles and triangles]
* 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres]

1B

identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line

identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces

identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]

compare and sort common 2-D and 3-D shapes and everyday objects

Position, direction and movement

1A

describe position, direction and movement, including half, quarter and three-quarter turns.

1B

use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and
anti-clockwise)

order and arrange combinations of mathematical objects in patterns and sequences

Interpreting, constructing and presenting data

1B

interpret and construct simple pictograms, tally charts, block diagrams and simple tables
ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
ask and answer questions about totalling and comparing categorical data

Maths Milestones

Milestone 2

Number and Place value

2A

count from 0 in multiples of 4, 8, 50 and 100

find 10 or 100 more or less than a given number

2B

count backwards through zero to include negative numbers

count in multiples of 6, 7, 9, 25 and 1 000

find 1 000 more or less than a given number

Comparing Numbers

2A

compare and order numbers up to 1000

2B

order and compare numbers beyond 1 000

compare numbers with the same number of decimal places up to two decimal places

(copied from Fractions)

Identifying, representing & Estimating Numbers

2A

identify, represent and estimate numbers using different representations

2B

identify, represent and estimate numbers using different representation

Mental Calculations

2A

add and subtract numbers mentally, including:

* a three-digit number and ones
* a three-digit number and tens
* a three-digit number and hundreds

Written Methods

2A

add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction

2B

add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate

Inverse operations, estimating and checking answers

2A

estimate the answer to a calculation and use inverse operations to check answers

2B

estimate and use inverse operations to check answers to a calculation

Problem Solving

2A

solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

2B

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

Multiplication and Division facts

2A

count from 0 in multiples of 4, 8, 50 and 100
(copied from Number and Place Value)
recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

2B

count in multiples of 6, 7, 9, 25 and 1 000
(copied from Number and Place Value)

recall multiplication and division facts for multiplication tables up to 12 × 12

Mental Calculation

2A

write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods)

2B

use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers

recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers).

Written Calculations

2A

write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)

Counting in fractional steps

2B

multiply two-digit and three-digit numbers by a one-digit number using formal written layout

Properties of numbers: multiples, factors, prime, square and cube numbers

2B

recognise and use factor pairs and commutativity in mental calculations (repeated)

Counting in fractional steps

2A

recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators

recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.

recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators

2B

recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten

Comparing and rounding decimals

2B

compare numbers with the same number of decimal places up to two decimal places

round decimals with one decimal place to the nearest whole number

Equivalence

2B

recognise and show, using diagrams, families of common equivalent fractions

recognise and write decimal equivalents of any number of tenths or hundredths

recognise and write decimal equivalents to 1/4; 1/2; 3/4

Adding and subtraction of fractions

2A
add and subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7)

2B

add and subtract fractions with the same denominator

Multiplication and division of decimals

2B

find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths

Problem Solving

2A
solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number
solve simple measure and money problems involving fractions and decimals to two decimal places.

2B
solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number
solve simple measure and money problems involving fractions and decimals to two decimal places.

Comparing and Estimating (including Measurement)

2A
compare durations of events, for example to calculate the time taken by particular events or tasks

2B
estimate, compare and calculate different measures, including money in pounds and pence
(also included in Measuring

Measures and calculating

2A
measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
measure the perimeter of simple 2-D shapes
add and subtract amounts of money to give change, using both £ and p in practical contexts

2B
estimate, compare and calculate different measures, including money in pounds and pence
(appears also in Comparing)
measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres
find the area of rectilinear shapes by counting squares

Time

2A

tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks

estimate and read

time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight

(appears also in Comparing and Estimating)

2B

read, write and convert time between analogue and digital 12 and 24-hour clocks

(appears also in Converting)

solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)

Converting

2A

know the number of seconds in a minute and the number of days in each month, year and leap year

2B

convert between different units of measure (e.g. kilometre to metre; hour to minute)

read, write and convert time between analogue and digital 12 and 24-hour clocks

(appears also in Converting)

solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days

(appears also in Telling the Time)

Identifying shapes and their properties

2B

identify lines of symmetry in 2-D shapes presented in different orientations

Drawing & Constructing

2A

draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them

2B

complete a simple symmetric figure with respect to a specific line of symmetry

Comparing & Classifying

2B

compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes

Angles

2A

recognise angles as a property of shape or a description of a turn
identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle
identify horizontal and vertical lines and pairs of perpendicular and parallel lines

2B

identify acute and obtuse angles and compare and order angles up to two right angles by size

Position, direction and movement

2B

describe positions on a
2-D grid as coordinates in the first quadrant
describe movements between positions as translations of a given unit to the left/right and up/down
plot specified points and draw sides to complete a given polygon

Interpreting, constructing and presenting data

2A

interpret and present data using bar charts, pictograms and tables

2B

interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs

Solving problems

2A

solve one-step and two-step questions [e.g. ‘How many more?’ and ‘How many fewer?’] using information presented in scaled bar charts and pictograms and tables.

2B

solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

Maths Milestones

Milestone 3

Number and Place value

3A

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

3B

use negative numbers in context, and calculate intervals across zero

Comparing Numbers

3A

read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)

3B

read, write, order and compare numbers up to

10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)

Mental Calculations

3A

add and subtract numbers mentally with increasingly large numbers

3B

perform mental calculations, including with mixed operations and large numbers

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

Written Methods

3A
add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
Inverse operations, estimating and checking answers

Inverse operations, estimating and checking answers

3A
use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
3B
use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Problem Solving

3A

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

3B

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

Multiplication and Division facts

3A

count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
(copied from Number and Place Value)
multiply and divide numbers mentally drawing upon known facts

Mental Calculation

3A

multiply and divide numbers mentally drawing upon known facts

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

3B

perform mental calculations, including with mixed operations and large numbers

associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8)

Written Calculations

3A

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
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

3B

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 short division where appropriate for the context 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

use written division methods in cases where the answer has up to two decimal places (copied from Fractions (including decimals))

Properties of numbers: multiples, factors, prime, square and cube numbers

3A

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

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)

3B

identify common factors, common multiples and prime numbers

use common factors to simplify fractions; use common multiples to express fractions in the same denomination (copied from Fractions)

calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm3) and cubic metres (m3), and extending to other units such as mm3 and km3

(copied from Measures)

Comparing Fractions

2A

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

(appears also in Equivalence)

2B

compare and order fractions, including fractions >1

Comparing and rounding decimals

3A

read, write, order and compare numbers with up to three decimal places
round decimals with two decimal places to the nearest whole number and to one decimal place

3B

identify the value of each digit in numbers given to three decimal places
solve problems which require answers to be rounded to specified degrees of accuracy

Equivalence

3A

identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
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
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 as a decimal fraction

3B
use common factors to simplify fractions; use common multiples to express fractions in the same denomination

associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8)

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

Adding and subtraction of fractions

3A
add and subtract fractions with the same denominator and multiples of the same number
recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. 2/5 + 4/5 = 6/5 = 11/5)

3B

add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

Multiplication and division of fractions

3A
multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams

3B
multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. 1/4 × 1/2 = 1/8)
multiply one-digit numbers with up to two decimal places by whole numbers
divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6)

Multiplication and division of decimals

3B

multiply one-digit numbers with up to two decimal places by whole numbers
multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction
(e.g. 3/8)
use written division methods in cases where the answer has up to two decimal places

Problem solving

3A
solve problems involving numbers 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 with a denominator of a multiple of 10 or 25.

Ratio & Proportion

3B

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.

Comparing & Estimating (including measurement)

3A

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 (also included in measuring

estimate volume (e.g. using 1 cm3 blocks to build cubes and cuboids) and capacity (e.g. using water)

3B

calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm3) and cubic metres (m3), and extending to other units such as mm3 and km3.

Measures & Calculating

3A

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

(copied from Multiplication and Division)

3B

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 [e.g. mm3 and km3].

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

Converting

3A

convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)

solve problems involving converting between units of time

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

3B

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

(appears also in Measuring and Calculating)

convert between miles and kilometres

Identifying shapes and their properties

3A

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

3B

Drawing & Constructing

3A

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

3B

draw 2-D shapes using given dimensions and angles

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

Comparing & Classifying

3A

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

3B

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

Angles

3A

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

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

3B

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

Position, direction & movement

3A

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

3B

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.

Interpreting, constructing & presenting data

3A

complete, read and interpret information in tables, including timetables

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

3B

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

calculate and interpret the mean as an average