Maths Milestones

Key Objectives	Milestone 1 By the end of Reception	Milestone 2 By the end of Year 2	Milestone 3 By the end of Year 4	Milestone 4 By the end of Year 6
Place Value	• Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.	• Children count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward • Children compare and order numbers from 0 up to 100; use <, > and = signs • Children identify, represent and estimate numbers using different representations, including the number line. • Read and write numbers to at least 100 in numerals and words. • Identify, represent and estimate numbers using different representation including the number line. • Recognise the value of each digit in a two-digit number.	• count in multiples of 6, 7, 9, 25 and 1000 • find 1000 more or less than a given number • count backwards through zero to include negative numbers • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, ones) • order and compare numbers beyond 1000 • Identify, represent and estimate numbers using different representations • Round any numbers 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.	• Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit • Round any whole number to 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.
Addition and Subtraction	• Children are able to identify 'one more' and 'one less' than a given number. • Children are able to add and subtract two single-digit numbers and count on or back to find the answer.	• Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100. • Show the addition of two numbers can be done in any order and subtraction can not. • Recognise and use the inverse relationship between addition	• add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use the inverse operations to check answers to a calculation	• Perform mental calculations, including with mixed operations and large numbers • Use knowledge of the order of operations to carry out calculations involving the four operations • solve addition and subtraction multi-step problems in contexts,

	• Children solve problems, including doubling, halving and sharing.	and subtraction and use this to check calculations and solve missing number problems. • Add and subtract numbers using concrete objects, pictorial representations and mentalling including: 2-digit number and 1s, 2-digit number and 10s, two 2-digit numbers, adding three 1-digit numbers.	• solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	deciding which operations and methods to use and why.
Multiplication and Division	• Children count in steps of 2. • Children solve problems including doubling, halving and sharing.	• Recall and use multiplication and division facts for 2, 5 and 10 including recognising odd and even numbers. • show that multiplication of 2 numbers can be done is any order by division cannot. • Use x = ÷ signs • Solve problems involving multiplication and division using materials, arrays, repeated addition, mental methods and multiplication and division facts.	• recall multiplication and division facts for multiplication tables up to 12 × 12 • 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 • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	• 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 • Identify common factors, common multiples and prime numbers • Use knowledge of the order of operations to carry out calculations involving the four operations.
Fractions	• Children solve problems, including doubling, halving and sharing.	• Recognise, find, name and write fractions ½ ¼ 2/4 and ¾ of a length, shape, set of objects or quantities.	• recognise and show, using diagrams, families of common equivalent fractions • count up and down in hundredths; recognise that	**Fractions** • use common factors to simplify fractions; use common

		• Recognise the equivalence of 2/4 and 1/2 • Write simple fractions for example ½ of 6= 3	hundredths arise when dividing an object by one hundred and dividing tenths by ten. • 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 • add and subtract fractions with the same denominator • recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$. 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 • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure and money problems involving fractions and decimals to two decimal places.	multiples to express fractions in the same denomination • compare and order fractions, including fractions > 1 • add 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, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ • divide proper fractions by whole numbers – for example $\frac{1}{3} \div 2 = \frac{1}{6}$ • associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction (for example $\frac{3}{8}$) • 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 • 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. **Ration & 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.
Algebra	• Children are building a secure number base to inform their later exploration of this area of maths.	• Recognise and use the inverse relationship between addition and subtraction for numbers within 100 and use this to check calculations and solve missing number problems.	• Recognise and use the inverse relationship between addition and subtraction for numbers within 1000 and use this to check calculations and solve missing number problems. • Work on finding all possibilities to an unknown variable by working systematically.	• use simple formulae • generate and describe linear number sequence • express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables.

Measurement	• Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. • Children talk about past and present events in their own lives and in the lives of family members.	• Choose and use standard units to estimate and measure length/height in any direction, mass, temperature, capacity to nearest appropriate unit using appropriate equipment. (m/cm) (g, kg) (c°) (l/ml) • compare and order lengths, mass, volume/capacity and record the results using < > = • Recognise and use symbols for pound (£) and pence (p); combine amounts to make a particular value. • Find different combinations of coins that equal the same value. • Solve simple problems in a practical context involving addition and subtraction of money of the same unit, giving context. • Compare and sequence intervals of time. • Tell and write the time for five minutes including quarter past/to the hour and draw the hands of the clock to show these times. • Know the number of minutes in an hour and the number of hours in a day.	• Convert between different units of measure [for example, kilometre to metre; hour to minute] • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares • estimate, compare and calculate different measures, including money in pounds and pence • read, write and convert time between analogue and digital 12- and 24-hour clocks • □ solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	• □ 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)
Geometry	• They recognise, create and describe patterns. • They explore characteristics of everyday objects and shapes and use mathematical language to describe them.	• Identify and describe the properties of 2-D shapes including the number of sides and lines of symmetry in a vertical line. • Identify 2-D shapes on the surface of 3-D shapes. • Compare and sort common 2-D shapes and everyday objects.	**Properties of shapes** • Compare and classify geometric shapes, including quadrilaterals and triangles**,** based on their properties and sizes • identify acute and obtuse angles and compare and order	**Properties of shapes** • draw 2-D shapes using given dimensions and angles • recognise, describe and build simple 3-D shapes, including making nets • compare and classify geometric shapes based on their

		• Recognise and name 3-D shapes including cuboids, cubes, pyramids and spheres). • Compare and sort common 3-D shapes and everyday objects. • Order and arrange combinations of mathematical objects in patterns and sequences. • Use mathematical vocabulary to describe position, direction and 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).	angles up to two right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry. **Position and Direction** • 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 side to complete a given polygon.	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. **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.
Statistics	• Children engage in regular class votes to promote data collection discussions.	• Interpret and construct simple pictograms, tally charts, block digraphs and simple tables. • Interpret data and answer simple questions by sorting and counting objects. • Ask and answer questions about totalling and comparing categorical data.	• interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	• interpret and construct pie charts and line graphs and use these to solve problems • calculate and interpret the mean as an average.

KIRFs
(Key Instant Recall Facts)

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counts in 2s and 10s	Count forward and backwards in steps of 2, 5 and 10	Times tables: 10, 5 & 2 (Multiplication and division)	Times tables: 4, 8, 3 & 11 (Multiplication and division)	Times tables: 6, 9, 7 & 12 (Multiplication and division)	Improving speed and accuracy in all times tables 2 - 12	Improving speed and accuracy in all times tables 2 - 12
Say number names in order to 20	Know all numbers bonds within 20	Know the number of minutes in an hour and hours in a day	Know the numbers of seconds in a minute, days in each month, year and leap year	Knows all number bonds to 50	Knows all number bonds to 100	Identify common factors, common multiples & prime numbers
Know the number bonds to 5 Begin to learn the number bonds to 10	Know the days of the week, the months of the year and the seasons	Know all the doubles and halves to 20	Know all the doubles and halves to 100.	Know the doubles and halves of all 2 digit numbers	Recall prime numbers up to 19	Recall and use equivalences between simple fractions, decimals and percentage.
Begin to learn the days of the week	Know all addition and subtraction facts for all numbers 0 - 20	Know all addition and subtraction facts for multiples of 10 to 100	Knowing 10 or 100 more than any given number		Multiple and divide whole numbers and those involving decimals by 10, 100 and 1000	
Partition numbers to 5 in two groups	Accurately subitise groups of objects to 6		Recognise and use Roman numerals (I – XII)		Recognise square numbers and cube numbers	
Subitise groups of objects to 4	Know all the doubles and halves to 10				Recognise and use Roman numerals (I – M)	