Progression and Core Knowledge in Mathematics

National Curriculum Objectives for KS1

Number and Place Value

Y1:

- 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
- From a given number up to 100, identify one more and one less
- Identify and represent numbers using objects and pictorial representations including the number line.
- Use the language of: equal to, more than, less than (fewer), most, least
- Read and write numbers from 1 to 20 in numerals and words

Y2:

- Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
- Recognise the place value of each digit in a two-digit number (tens, ones)
- Identify, represent and estimate numbers using different representations, including the number line
- Compare and order numbers from 0 up to 100; use <, > and = signs
- Read and write numbers to at least 100 in numerals and in words
- Use place value and number facts to solve problems

Addition and Subtraction:

Y1:

- Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs
- Represent and use number bonds and related subtraction facts within 20
- Add and subtract one-digit and two-digit numbers to 20, including zero
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems

Y2:

- 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
- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- 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
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Multiplication and Division:

Y1:

- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

Y2:

- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Fractions

Y1:

- Recognise, find and name a half as one of two equal parts of an object, shape or quantity
- Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.

Y2:

- Recognise, find, name and write fractions 1/3 , 1/4 , 2/4 and 3/4 of a length, shape, set of objects or quantity
- Write simple fractions for example, 1/2 of 6 = 3
- Recognise the equivalence of ½ and 2/4

Geometry

Y1:

- Recognise and name common 2-D and 3-D shapes, including: 2-D shapes (for example, rectangles (including squares), circles and triangles] 3-D shapes (for example, cuboids (including cubes), pyramids and spheres).
- Describe position, direction and movement, including whole, half, quarter and three-quarter turns.

Y2:

- Identify and describe the properties of 2-D shapes, including the number of sides and line of 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.

Measures

Y1:

- Compare, describe and solve practical problems for:
  - lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]
  - mass/weight [for example, heavy/light, heavier than, lighter than]
  - capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]
  - time [for example, quicker, slower, earlier, later]
- 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
- Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]
- Recognise and use language relating to dates, including days of the week, weeks, months and years
- Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.

Y2:

- 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
- Compare and order lengths, mass, volume/capacity and record the results using >, < and =
- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Find 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

- Compare and sequence intervals of time
- 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.

	EYFS	Y1	Y2
Number and Place Value	Develop fast recognition of up to 3 objects, without having to count them individually Recite numbers past 5 Say one number for each item in order 1,2,3,4,5 Know that the last number reached when counting a small set of objects tells you how many there are in total Show finger numbers up to 5 Link numeral and amounts: showing 5 objects to match 5 Count objects, actions and sounds Subitise Link the number symbol with its cardinal number value Count beyond ten Compare numbers Understand the 'one more than/one less than' relationship between consecutive numbers Explore the composition of numbers to 10	Counting 1, 2, 3… as reciting numbers and by enumerating objects. Ordering first, second, third… Recognise place value in numbers up to 20, and begin to recognise up to 100, using counters, 10 frames, number lines and tracks, Numicon and other objects to represent tens and ones. Interpret and draw pictorial representations with part-part whole models and begin to use bar models. Compare numbers beginning to use < / > Know that the ones change and the tens don't when finding one more or less Count in 2s, 5s and 10s from different multiples to develop patterns in the number system. Know what odd and even numbers are.	Use double-sided counters, base 10, 10 frames and number lines to represent numbers to 100. Know how to count in multiples of 3 Draw part-part whole models and bar models to partition numbers in different ways. Discuss, reason with and solve problems that emphasize the value of each digit in a two-digit number. Use the terms tens and ones correctly. Be able to spell numbers to 100 correctly. Begin to understand zero as a place holder

	EYFS	Y1	Y2
Addition and Subtraction	Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.	Recall all bonds to and within 10 fluently. Use all bonds to and within 20 Reason with bonds in different forms eg: 9 + 7 = 16, 16 – 7 = 9, 7 = 16 – 9 Know that = means balanced on both sides of the equation Know the effect of adding or subtracting 0. Count forwards and backwards to increase or decrease numbers. Discuss and solve problems in familiar contexts including quantities. Use the terms: put together, add, total, take away, distance between, difference between, more than, less than, greater than, smaller than, equals, the same as	Become increasingly fluent in addition and subtraction facts to 20 in deriving facts such as 3 + 7 = 10, 10 – 7 = 3, 7 = 10 – 3 to calculate 30 + 70 = 100, 100 – 70 = 30, 70 = 100 – 30 Use base 10 concretely and draw representations to make calculations Use bar models to represent calculations Check calculations, using adding to check subtraction and vice versa Show commutativity by adding numbers in different orders eg 5 + 3 + 1 = 1 + 3 + 5 = 3 + 1 + 5 Record addition and subtraction in columns using place value in preparation for formal written methods.

	EYFS	Y1	Y2
Multiplication and Division	Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how numbers can be distributed equally.	Group and share small quantities Double and halve small quantities	Use the multiplication tables and connect them to each other. Practise repeated addition as a step to multiplication. Practise grouping and sharing to divide. Connect the 10 times table to place value. Connect the 5 times table to divisions on an analogue clock face. Recall multiplication facts using related division facts and vice versa. Understand commutativity in multiplication and show this using arrays. Use inverse operations to check calculations, representing this with bar models.
Fractions		Find half and a quarter of shapes, small quantities, lengths and objects. Know that to find a half or a quarter you need equal grouping and sharing of sets of objects and measures. Combine halves and quarters as parts of a whole.	Solve problems of shape, objects, quantities and measures. Understand and use the terms numerator and denominator Connect unit fractions to equal sharing and grouping of numbers, measures and shapes. Understand that ¾ is 3 x ¼ and ¼ + ¼ + ¼ , noticing that the numerator changes but the denominator doesn't. Count in fractions up to 10 from any given number. Understand the equivalence of ½ and 2/4, represented on a number line, bar model and in shapes.

	EYFS	Y1	Y2
Geometry	Talk about and explore 2D and 3D shapes (circles, rectangles, triangles, cuboids). Select, rotate and manipulate shapes to develop spatial reasoning skills. Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.	Handle common 2D and 3D shapes, name them and recognise them in everyday objects. Recognise the shapes in different orientations and sizes. Know that rectangles, triangles, cuboids and pyramids are not always similar to each other. Use the language of position, direction and motion: Left, right; top, middle, bottom; on top of, in front of, above, between around, near, close and far, up and down, forwards and backwards, inside and outside.	Handle and name a wide variety of 2D and 3D shapes including prism and cones. Describe the difference between a square / rectangle and a cube / cuboid according to their properties Sort shapes according to their properties
Measures	Make comparisons between objects relating to size, length, weight and capacity. Compare length, weight and capacity.	Use the terms mass and weight; volume and capacity interchangeably. Compare different types of quantities and measures using non-standard units. Begin to use measuring tools – ruler, weighing scales and containers to read and record manageable standard units. Tell the time throughout the day using o'clock and half past.	Use standard units of measure with increasing accuracy Use the terms mass, weight, length, height, capacity, volume, temperature, centigrade Use standard abbreviations – mm, cm, m, g, kg, ml, l, *C Use rulers, measuring jugs and scales confidently. Compare measures including simple multiples eg twice as high, half as wide Recognise all the coins and notes used in the UK, Record pounds and pence separately. Know how to tell the time on an analogue clock and record it.