Detailed Mathematics Breakdown

Mathematics in Year 1

As children begin their compulsory schooling in Year 1, schools will naturally work to build on the learning that takes place in the Reception year. Here are some of the main things your child is likely to be taught during their time in Year 1.

Number and Place Value

Place value is central to mathematics. Recognising that the digit '5' in the number 54 has a different value from the number 5 or the '5' in 504 is an important step in mathematical understanding.

- Count, both forwards and backwards, from any number, including past 100
- Read and write numbers up to 100 as digits
- Count in 2s, 5s and 10s
- Find 'one more' or 'one less' than a number
- Use mathematical language such as 'more', 'less', 'most', 'least' and 'equal'

Calculations

- Use the +, –- and = symbols to write and understand simple number calculations
- Add and subtract one- and two-digit numbers, up to 20
- Solve missing number problems, such as 10 – ? = 6
- Begin to use simple multiplication by organising and counting objects

Fractions

- Understand 14 and 12 to explain parts of an object or number of objects

Measurements

- Use practical apparatus to explore different lengths, weights and volumes
- Use language such as 'heavier', 'shorter' and 'empty' to compare things they have measured
- Recognise the different coins and notes of British currency
- Use language of time, such as 'yesterday', 'before', days of the week and months of the year
- Tell the time to the hour and half-hour, including drawing clock faces

Shape

- Recognise and name some common 2-d shapes, such as squares, rectangles and triangles
- Recognise and name some common 3-d shapes, such as cubes, cuboids and spheres
- Describe movements, including quarter turns

Mathematics in Year 2

During Key Stage 1, there is a big focus on developing basic number skills. That means securing a good understanding of place value, and recognising number bonds to 20. Practising these skills frequently will help children's mathematical thinking throughout school.

Number bonds are essential to the understanding of maths. Children in Year 2 learn their number bonds to 20, that is being able to quickly recall the total of any two numbers up to 20, e.g. 5 + 9 = 14, rather than having to count on to find the answer.

At the end of Year 2, all children will sit the National Curriculum Tests for Key Stage 1. This will include a short arithmetic test of 15 questions, and a second paper of broader mathematics which will last around 35 minutes.

Number and Place Value

- Recognise place value in two-digit numbers, e.g. knowing that the 1 in 17 represents 10
- Read and write numbers up to 100 as words
- Count in 2s, 3s and 5s
- Compare and order numbers up to 100
- Use the < and > symbols to represent the relative size of numbers

Calculations

- Recall number bonds up to 20 fluently
- Add and subtract numbers mentally and using objects, including two-digit numbers
- Show that adding two numbers can be done in any order, but subtracting cannot
- Recognise that addition and subtraction are inverse operations
- Learn the multiplication and division facts for the 2x, 5x and 10x tables
- Show that multiplying two numbers can be done in any order, but dividing cannot
- Solve problems using the x and ÷ symbols

Fractions

- Find 14, 24 and 34 of an object or set of objects
- Find the answer to simple fraction problems, such as finding 12 of 6

Measurements

- Use standard units to measure length (centimetres and metres), mass (grams and kilograms), temperature (degrees Celsius) and capacity (millilitres and litres)
- Use the £ and p symbols for money amounts
- Combine numbers of coins to make a given value, for example to make 62 pence
- Tell the time to the nearest five minutes on an analogue clock
- Know the number of minutes in an hour and hours in a day

Shape

- Identify the number of sides and a line of symmetry on 2-d shapes
- Identify the number of faces, edges and vertices on 3-d shapes
- Use mathematical language to describe position and direction, including rotations and turns

Graphs and Data

- Construct and understand simple graphs such as bar charts and pictograms

Mathematics in Year 3

During the years of lower Key Stage 2 (Year 3 and Year 4), the focus of mathematics is on the mastery of the four operations (addition, subtraction, multiplication and division) so that children can carry out calculations mentally, and using written methods. In Year 3 your child is likely to be introduced to the standard written column methods of addition and subtraction.

Number and Place Value

- Count in multiples of 4, 8, 50 and 100
- Recognise the place value of digits in three-digit numbers (using 100, 10s and 1s)
- Read and write numbers up to 1,000 using digits and words
- Compare and order numbers up to 1,000

Calculations

- Add and subtract numbers mentally, including adding either 1s, 10s or units to a 3-digit number
- Use the standard column method for addition and subtraction for up to three digits
- Estimate the answers to calculations, and use inverse calculations to check the answers
- Learn the 3x, 4x and 8x tables and the related division facts, for example knowing that 56 ÷ 8 = 7
- Begin to solve multiplication and division problems with two-digit numbers

Fractions

Equivalent fractions are fractions which have the same value, such as 12 and 36 or 14 and 28 .

- Understand and use tenths, including counting in tenths
- Recognise and show equivalent fractions with small denominators
- Add and subtract simple fractions worth less than one, for example 57 + 17 = 67
- Put a sequence of simple fractions into size order

Measurements

- Solve simple problems involving adding and subtracting measurements such as length and weight
- Measure the perimeter of simple shapes
- Add and subtract amounts of money, including giving change
- Tell the time to the nearest minute using an analogue clock
- Use vocabulary about time, including a.m. and p.m., hours, minutes and seconds
- Know the number of seconds in a minute and the number of days in a year or leap year

Shape and Position

- Draw familiar 2-d shapes and make familiar 3-d shape models
- Recognise right angles, and know that these are a quarter turn, with four making a whole turn
- Identify whether an angle is greater than, less than or equal to a right angle
- Identify horizontal, vertical, perpendicular and parallel lines

Parallel lines are those which run alongside each other and never meet. Perpendicular lines cross over each other meeting exactly at right angles.

Graphs and Data

- Present and understand data in bar charts, tables and pictograms
- Answer questions about bar charts that compare two pieces of information

Mathematics in Year 4

By the end of Year 4, children will be expected to know all of their times tables up to 12 x 12 by heart. This means not only recalling them in order but also being able to answer any times table question at random, and also knowing the related division facts. For example, in knowing that 6 x 8 = 48, children can also know the related facts that 8 x 6 = 48 and that 48 ÷ 6 = 8 and 48 ÷ 8 = 6. This expertise will be particularly useful when solving larger problems and working with fractions.

Number and Place Value

- Count in multiples of 6, 7, 9, 25 and 1,000
- Count backwards, including using negative numbers
- Recognise the place value in numbers of four digits (1000s, 100s, 10s and 1s)
- Put larger numbers in order, including those greater than 1,000
- Round any number to the nearest 10, 100 or 1,000
- Read Roman numbers up to 100

Roman Numerals' Basics:I = 1 ; V = 5 ; X = 10 ; L = 50 ; C = 100Letters can be combined to make larger numbers. If a smaller value appears in front of a larger one then it is subtracted, e.g. IV (5 – 1) means 4. If the larger value appears first then they are added, e.g. VI (5 + 1) means 6.

Calculations

- Use the standard method of column addition and subtraction for values up to four digits
- Solve two-step problems involving addition and subtraction
- Know the multiplication and division facts up to 12 x 12 = 144
- Use knowledge of place value, and multiplication and division facts to solve larger calculations
- Use factor pairs to solve mental calculations, e.g. knowing that 9 x 7 is the same as 3 x 3 x 7
- Use the standard short multiplication method to multiply three-digit numbers by two-digit numbers

Fractions

- Use hundredths, including counting in hundredths
- Add and subtract fractions with the same denominator, e.g. 47 + 57

- Find the decimal value of any number of tenths or hundredths, for example 7100 is 0.07
- Recognise the decimal equivalents of 14, 12 and 34
- Divide one- or two-digit numbers by 10 or 100 to give decimal answers
- Round decimals to the nearest whole number
- Compare the size of numbers with up to two decimal places

Measurements

Convert between different measures, such as kilometres to metres or hours to minutes

- Calculate the perimeter of shapes made of squares and rectangles
- Find the area of rectangular shapes by counting squares
- Read, write and convert times between analogue and digital clocks, including 24-hour clocks
- Solve problems that involve converting amounts of time, including minutes, hours, days, weeks and months

Shape and Position

- Classify groups of shapes according to the properties, such as sides and angles
- Identify acute and obtuse angles
- Complete a simple symmetrical figure by drawing the reflected shape
- Use coordinates to describe the position of something on a standard grid
- Begin to describe movements on a grid by using left/right and up/down measures

Graphs and Data

- Construct and understand simple graphs using discrete and continuous data

Discrete data is data which is made up of separate values, such as eye colour or shoe size. Continuous data is that which appears on a range, such as height or temperature.

Mathematics in Year 5

During the years of upper Key Stage 2 (Year 5 and Year 6), children use their knowledge of number bonds and multiplication tables to tackle more complex problems, including larger multiplication and division, and meeting new material. In Year 5, this includes more work on calculations with fractions and decimals, and using considerably larger numbers than previously.

Number and Place Value

- Recognise and use the place value of digits in numbers up to 1 million (1,000,000)
- Use negative numbers, including in contexts such as temperature
- Round any number to the nearest 10, 100, 1,000, 10,000 or 100,000
- Read Roman numerals, including years

Calculations

- Carry out addition and subtraction with numbers larger than four digits
- Use rounding to estimate calculations and check answers are of a reasonable size
- Find factors of multiples of numbers, including finding common factors of two numbers
- Know the prime numbers up to 19 by heart, and find primes up to 100
- Use the standard methods of long multiplication and short division
- Multiply and divide numbers mentally by 10, 100 or 1,000
- Recognise and use square numbers and cube numbers

Factors are numbers which multiply to make a product, for example 2 and 9 are factors of   18.Common factors are numbers which are factors of two other numbers, for example 3 is a factor of both 6 and 18.

Fractions and Decimals

- Put fractions with the same denominator into size order, for example recognising that 35 is larger than 25
- Find equivalents of common fractions
- Convert between improper fractions and mixed numbers, for example recognising that 54 is equal to 114
- Add and subtract simple fractions with related denominators, for example 23 + 16 = 56
- Convert decimals to fractions, for example converting 0.71 to 71100
- Round decimals to the nearest tenth
- Put decimals with up to three decimal places into size order
- Begin to use the % symbol to relate to the 'number of parts per hundred'

In a fraction, the numerator is the number on top; the denominator is the number on the   bottom.

Measurements

- Convert between metric units, such as centimetres to metres or grams to kilograms

- Use common approximate equivalences for imperial measures, such as 2.5cm ≈ 1 inch
- Calculate the area of rectangles using square centimetres or square metres
- Calculate the area of shapes made up of rectangles
- Estimate volume (in cm3) and capacity (in ml)

Shape and Position

- Estimate and compare angles, and measure them to the nearest degree
- Know that angles on a straight line add up to 180°, and angles around a point add up to 360°
- Use reflection and translation to change the position of a shape

Graphs and Data

- Read and understand information presented in tables, including timetables
- Solve problems by finding information from a line graph

Mathematics in Year 6

By the end of Year 6, children are expected to be confident with the use of all four standard methods for written calculations, and to have secured their knowledge of the key number facts for the four operations. Their work will focus more on fractions, ratio, proportion and the introduction of algebra.

In May of Year 6, children will take an arithmetic test of thirty minutes, and two broader mathematics tests of forty minutes each. These will be sent away for marking, with the results coming back before the end of the year. Your child's teacher will also make an assessment of whether or not your child has reached the expected standard by the end of the Key Stage.

Number and Place Value

- Work with numbers to up ten million (10,000,000) including negative numbers
- Round any number to any required number of digits or magnitude

Calculations

- Use the standard method of long multiplication for calculations of four-digit numbers by two-digit numbers
- Use the standard method of long division for calculations of four-digit numbers by two-digit numbers

- Identify common factors, common multiples and prime numbers
- Carry out complex calculations according to the mathematical order of operations
- Solve complex problems using all four operations

The mathematical order of operations requires that where calculations are written out in long statements, first calculations in brackets are completed, then any multiplication or division calculations, and finally any addition or subtraction. So, for example, the calculation 4 + 3 x (6 + 1) has a solution of 25, not 43 or 49.

Fractions and Decimals

- Use common factors to simplify fractions, or to add fractions with different denominators
- Place any group of fractions into size order
- Multiply pairs of fractions together
- Divide fractions by whole numbers, for example 13 ÷ 2 = 16
- Use division to calculate the decimal equivalent of a fraction
- Know and use common equivalences between fractions, decimals and percentages, such as 12 = 0.5 = 50%

Ratio and Proportion

- Find percentages of quantities, such as 15% of £360
- Use ratio to explain relationships and solve problems
- Use simple scale factors for drawings, shapes or diagrams

Ratio is represented using the colon symbol. For example, if £100 is shared in a ratio of 1:3 between two people, then the first person receives £25 (one part), with the other receiving £75 (three parts).

Algebra

- Use simple formulae
- Describe sequences of numbers where the increase between values is the same each time
- Solve missing number problems using algebra
- Find possible solutions to problems with two variables, such as a + b = 10

Measurements

- Convert between any metric units and smaller or larger units of the same measure
- Convert between miles and kilometres

Use a given formula to find the area of a triangle or parallelogram

Shape and Position

- Draw 2-d shapes using given sizes and angles
- Use knowledge of 2-d shapes to find missing angles in triangles, quadrilaterals and other regular shapes
- Name and label the radius, diameter and circumference of a circle
- Find missing angles in problems where lines meet at a point or on a straight line
- Use a standard grid of coordinates including negative values

Graphs and Data

- Construct and understand pie charts and line graphs
- Calculate the mean average of a set of data

Mean average is calculated by adding up all the values and dividing by the number of items. For example, the mean average of 3, 5, 8, 9 and 10 is 7 (3 + 5 + 8 + 9 + 10 = 35, then 35 ÷ 5 = 7)