

## Lower Key Stage 2 – Years 3 and 4

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

**This long term curriculum planning document includes:**

- **pgs 2 – 5: programmes of study for the year group including statutory requirements and accompanying notes and guidance (non-statutory). Key objectives for the year group are written in bold.**
- **pg 6: appendix 1: table of key objectives for the year group taken from the National Curriculum and in a summarised form**
- **pg 7: appendix 2: overview of progression for the year group**
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## Year 3 programmes of study

The objectives highlighted in bold are considered by the school to be key objectives for the year group. The objectives have been selected either because they represent key content to be covered to allow access to the following year’s curriculum, or because it is the only or main time an objective is taught.

Year 3 programme of study (statutory requirements)	Notes and guidance (non-statutory)
<p><b>Number, place value and rounding</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>▪ <b>count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number</b></li> <li>▪ recognise the place value of each digit in a three-digit number (hundreds, tens, ones)</li> <li>▪ <b>compare and order numbers up to 1000</b></li> <li>▪ identify, represent and estimate numbers using different representations</li> <li>▪ read and write numbers up to 1000 in numerals and in words</li> <li>▪ solve number problems and practical problems involving these ideas.</li> </ul>	<p>Pupils now use multiples of 2, 3, 4, 5, 8, 10, 50 and 100.</p> <p>They use larger numbers to at least 1000, applying partitioning related to place value using varied and increasingly complex problems, building on work in year 2 (for example, <math>146 = 100 + 40 + 6</math>, <math>146 = 130 + 16</math>).</p> <p>Using a variety of representations, including those related to measure, pupils continue to count in ones, tens and hundreds, so that they become fluent in the order and place value of numbers to 1000.</p>
<p><b>Number - Addition and subtraction</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>▪ <b>add and subtract numbers mentally, including:</b> <ul style="list-style-type: none"> <li>▪ a three-digit number and ones</li> <li>▪ a three-digit number and tens</li> <li>▪ a three-digit number and hundreds</li> </ul> </li> <li>▪ <b>add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction</b></li> </ul>	<p>Pupils practise solving varied addition and subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100.</p> <p>Pupils use their understanding of place value and partitioning, and practise using columnar addition and subtraction with increasingly large numbers up to three digits to become fluent.</p>

<ul style="list-style-type: none"> <li>▪ <b>estimate the answer to a calculation and use inverse operations to check answers</b></li> <li>▪ solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</li> </ul>	
<p><b>Number - Multiplication and division</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>▪ <b>recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</b></li> <li>▪ 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</li> <li>▪ solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.</li> </ul>	<p>Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables.</p> <p>Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, <math>4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240</math>) and multiplication and division facts (for example, using <math>3 \times 2 = 6</math>, <math>6 \div 3 = 2</math> and <math>2 = 6 \div 3</math>) to derive related facts (for example, <math>30 \times 2 = 60</math>, <math>60 \div 3 = 20</math> and <math>20 = 60 \div 3</math>).</p> <p>Pupils develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division.</p> <p>Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits?; 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children).</p>
<p><b>Number - Fractions</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>▪ <b>count up and down in tenths; recognise that tenths arise from</b></li> </ul>	<p>Pupils connect tenths to place value, decimal measures and to division by 10.</p>

<p><b>dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10</b></p> <ul style="list-style-type: none"> <li>▪ <b>recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators</b></li> <li>▪ recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators</li> <li>▪ <b>recognise and show, using diagrams, equivalent fractions with small denominators</b></li> <li>▪ <b>add and subtract fractions with the same denominator within one whole [for example, <math>5/7 + 1/7 = 6/7</math>]</b></li> <li>▪ <b>compare and order unit fractions, and fractions with the same denominators</b></li> <li>▪ solve problems that involve all of the above.</li> </ul>	<p>They begin to understand unit and non-unit fractions as numbers on the number line, and deduce relations between them, such as size and equivalence. They should go beyond the <math>[0, 1]</math> interval, including relating this to measure.</p> <p>Pupils understand the relation between unit fractions as operators (fractions of), and division by integers.</p> <p>They continue to recognise fractions in the context of parts of a whole, numbers, measurements, a shape, and unit fractions as a division of a quantity.</p> <p>Pupils practise adding and subtracting fractions with the same denominator through a variety of increasingly complex problems to improve fluency.</p>
<p><b>Measurement</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>▪ <b>measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)</b></li> <li>▪ <b>measure the perimeter of simple 2-D shapes</b></li> <li>▪ <b>add and subtract amounts of money to give change, using both £ and p in practical contexts</b></li> <li>▪ <b>tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks</b></li> <li>▪ <b>estimate and read time with increasing accuracy to the nearest minute</b>; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight</li> </ul>	<p>Pupils continue to measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed units (for example, 1 kg and 200g) and simple equivalents of mixed units (for example, 5m = 500cm).</p> <p>The comparison of measures includes simple scaling by integers (for example, a given quantity or measure is twice as long or five times as high) and this connects to multiplication.</p> <p>Pupils continue to become fluent in recognising the value of coins, by adding and subtracting amounts, including mixed units, and giving change using manageable amounts. They record £ and p separately. The decimal recording of money is introduced formally in year 4.</p> <p>Pupils use both analogue and digital 12-hour clocks and record their times. In this way they become fluent in and prepared for using digital 24-hour</p>

<ul style="list-style-type: none"> <li>▪ know the number of seconds in a minute and the number of days in each month, year and leap year</li> <li>▪ compare durations of events [for example to calculate the time taken by particular events or tasks].</li> </ul>	<p>clocks in year 4.</p>
<p><b>Geometry - properties of shapes</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>▪ draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them</li> <li>▪ recognise angles as a property of shape or a description of a turn</li> <li>▪ identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; <b>identify whether angles are greater than or less than a right angle</b></li> <li>▪ <b>identify horizontal and vertical lines and pairs of perpendicular and parallel lines.</b></li> </ul>	<p>Pupils' knowledge of the properties of shapes is extended at this stage to symmetrical and non-symmetrical polygons and polyhedra. Pupils extend their use of the properties of shapes. They should be able to describe the properties of 2-D and 3-D shapes using accurate language, including lengths of lines and acute and obtuse for angles greater or lesser than a right angle.</p> <p>Pupils connect decimals and rounding to drawing and measuring straight lines in centimetres, in a variety of contexts.</p>
<p><b>Statistics</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>▪ <b>interpret and present data using bar charts, pictograms and tables</b></li> <li>▪ solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.</li> </ul>	<p>Pupils understand and use simple scales (for example, 2, 5, 10 units per cm) in pictograms and bar charts with increasing accuracy.</p> <p>They continue to interpret data presented in many contexts.</p>

**Appendix 1: Year 3 Key Objectives**

Taken from the National Curriculum	Summarised form
1. count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number	1. Count in multiples of 4. 8. 50 and 100
2. compare and order numbers up to 1000	2. Compare and order numbers up to 1000
3. add and subtract numbers mentally, including: HTU +/- U, HTU +/- T and HTU +/- H	3. Add and subtract numbers mentally, including round numbers to HTU
4. add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	4. Add and subtract using standard column method
5. estimate the answer to a calculation and use inverse operations to check answers	5. Estimate answers to calculations and use the inverse to check answers.
6. recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	6. Know 3x, 4x and 8x tables
7. count up and down in tenths	7. Count up and down in tenths
8. recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	8. Understand that tenths are objectives or quantities divided into ten equal parts
9. compare and order unit fractions, and fractions with the same denominators	9. Compare and order simple fractions
10. recognise and show, using diagrams, equivalent fractions with small denominators	10. Recognise and show equivalent fractions
11. recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	11. Find and write fractions of a set of objectives
12. add and subtract fractions with the same denominator within one whole [for example, $5/7 + 1/7 = 6/7$ ]	12. Add and subtract fractions with common denominators (less than one)
13. measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	13. Measure, compare and calculate measures using standard units
14. measure the perimeter of simple 2-D shapes	14. Measure the perimeter of simple 2D shapes
15. add and subtract amounts of money to give change, using both £ and p in practical contexts	15. Add and subtract money, including giving change
16. tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	16. Tell and write the time from an analogue clock, including using Roman numerals
17. estimate and read time with increasing accuracy to the nearest minute	17. Estimate and read time to the nearest minute
18. identify horizontal and vertical lines and pairs of perpendicular and parallel lines.	18. Identify horizontal, vertical, parallel and perpendicular lines
19. identify whether angles are greater than or less than a right angle	19. Identify whether angles are greater or less than a right angle
20. interpret and present data using bar charts, pictograms and tables	20. Interpret and present data using bar charts, pictograms and tables

## Appendix 2: Overview of Progression in Year 3

### Number and place value

In Year 2, children learned about place value in two-digit numbers. In Year 3, they will extend their understanding to include the place value of three-digit numbers – for example, 232 is two hundreds, three tens and two ones. They learn to count in 4s, 8s, 50s and 100s, and work with numbers up to 1000. They begin to use estimation when dealing with number problems involving larger numbers.

### Addition and subtraction

In Year 3, children practise mentally adding and subtracting combinations of numbers, including three-digit numbers. When using written methods for addition and subtraction, children learn to write the digits in columns, using their knowledge of place value to align the digits correctly. Children begin to use estimation to work out the rough answer to calculations in advance, and use inverse operations to check their final answers – for example, checking  $312 + 43 = 355$  by working out  $355 - 43 = 312$ .

### Multiplication and division

In Year 3, children learn the 3, 4 and 8 multiplication tables, and use their knowledge of doubling to explore links between the 2, 4 and 8 multiplication tables. They use facts from these new multiplication tables to solve multiplication and division problems. Building on their work with written mathematical statements in Year 2, they begin to develop more formal written methods of multiplication and division. They will extend this in Year 4 when they work with more complex multiplication and division problems.

### Fractions

Building on work from Year 2, children learn about tenths, and confidently count up and down in tenths. They begin to make links between tenths and place value (ten units make a ten; ten tens make a hundred) and explore connections between tenths and decimal measures. Children extend their understanding of fractions to include more non-unit fractions (that is those with digits other than 1 as their numerator – for example,  $1/5$  is a unit fraction, and  $2/5$  is a non-unit fraction). They also begin to add and subtract fractions with the same denominator up to one whole, such as  $3/5 + 3/5 = 4/5$ ,  $4/7 - 2/7 = 2/7$ .

### Measurement

Children will learn to tell the time from analogue 24-hour clocks as well as 12-hour clocks. They will move on to use digital 24-hour clocks in Year 4. They will extend their work on money from Year 2, including working out correct change. They will also learn to measure the perimeter of 2D shapes and solve addition and subtraction problems involving length, mass and volume.

### Geometry: properties of shapes

In Year 3, children begin to learn about angle as a property of shapes, and they connect the concept of angles with the idea of turning – for example, realising that two right angles equal a half-turn. They can identify whether a given angle is greater or less than a right angle (obtuse or acute). They can accurately describe lines as horizontal, vertical, perpendicular or parallel.

### Statistics

In Year 2, children were introduced to pictograms, tally charts, block diagrams and tables, and this year they use these diagrams to answer an increasing range of questions, including two-step questions (in other words, those where there is a hidden question that needs to be answered before the main question can be tackled) For example, in order to work out *how many more cupcakes did Jon eat than Janie*, children first need to find out how many cakes each person ate.