



Guidance

Curriculum
and standards

Primary

National Strategy

Learning objectives for mathematics poster pack

**Primary
headteachers,
teachers and
subject leaders**

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Learning objectives for mathematics: Foundation Stage – Year 4

Level description		Using and applying mathematics	Counting and understanding number	Knowing and using number facts	Calculating	Understanding shape	Measuring	Handling data		
<p>Level 3</p> <p>MA1 Pupils try different approaches and find ways of overcoming difficulties that arise when they are solving problems. They are beginning to organise their work and check results. Pupils discuss their mathematical work and are beginning to explain their thinking. They use and interpret mathematical symbols and diagrams. Pupils show that they understand a general statement by finding particular examples that match it.</p> <p>MA2 Pupils show understanding of place value in numbers up to 1000 and use this to make approximations. They begin to use decimal notation and to recognise negative numbers, in contexts such as money and temperature. Pupils use mental recall of addition and subtraction facts to 20 in solving problems involving larger numbers. They add and subtract numbers with two digits mentally and numbers with three digits using written methods. They use mental recall of the 2, 3, 4, 5 and 10 multiplication tables and derive the associated division facts. They solve whole-number problems involving multiplication or division, including those that give rise to remainders. They use simple fractions that are several parts of a whole and recognise when two simple fractions are equivalent.</p> <p>MA3 Pupils classify 3-D and 2-D shapes in various ways using mathematical properties such as reflective symmetry for 2-D shapes. They use non-standard units, standard metric units of length, capacity and mass, and standard units of time, in a range of contexts.</p> <p>MA4 Pupils extract and interpret information presented in simple tables and lists. They construct bar charts and pictograms, where the symbol represents a group of units, to communicate information they have gathered, and they interpret information presented to them in these forms.</p>	Year 4	<p>Solve one-step and two-step problems involving numbers, money or measures, including time; choose and carry out appropriate calculations, using calculator methods where appropriate</p> <p>Represent a puzzle or problem using number sentences, statements or diagrams; use these to solve the problem; present and interpret the solution in the context of the problem</p> <p>Suggest a line of enquiry and the strategy needed to follow it; collect, organise and interpret selected information to find answers</p> <p>Identify and use patterns, relationships and properties of numbers or shapes; investigate a statement involving numbers and test it with examples</p> <p>Report solutions to puzzles and problems, giving explanations and reasoning orally and in writing, using diagrams and symbols</p>	<p>Recognise and continue number sequences formed by counting on or back in steps of constant size</p> <p>Partition, round and order four-digit whole numbers; use positive and negative numbers in context and position them on a number line; state inequalities using the symbols < and > (e.g. -3 > -5, -1 < +1)</p> <p>Use decimal notation for tenths and hundredths and partition decimals; relate the notation to money and measurement; position one-place and two-place decimals on a number line</p> <p>Recognise the equivalence between decimal and fraction forms of one half, quarters, tenths and hundredths</p> <p>Use diagrams to identify equivalent fractions (e.g. $\frac{1}{2}$ and $\frac{2}{4}$, or $\frac{20}{100}$ and $\frac{2}{10}$); interpret mixed numbers and position them on a number line (e.g. 3 $\frac{1}{2}$)</p> <p>Use the vocabulary of ratio and proportion to describe the relationship between two quantities (e.g. 'There are 2 red beads to every 3 blue beads', or '2 beads in every 5 beads are red'); estimate a proportion (e.g. 'About one quarter of the apples in the box are green')</p>	<p>Use knowledge of addition and subtraction facts and place value to derive sums and differences of pairs of multiples of 10, 100 or 1000</p> <p>Identify the doubles of two-digit numbers; use these to calculate doubles of multiples of 10 and 100 and derive the corresponding halves</p> <p>Derive and recall multiplication facts up to 10 x 10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple</p> <p>Use knowledge of rounding, number operations and inverses to estimate and check calculations</p> <p>Identify pairs of fractions that total 1</p>	<p>Add or subtract mentally pairs of two-digit whole numbers (e.g. 47 + 58, 91 - 35)</p> <p>Refine and use efficient written methods to add and subtract two-digit and three-digit whole numbers and £, p</p> <p>Multiply and divide numbers to 1000 by 10 and then 100 (whole-number answers), understanding the effect; relate to scaling up or down</p> <p>Develop and use written methods to record, support and explain multiplication and division of two-digit numbers by a one-digit number, including division with remainders (e.g. 15 x 9, 98 ÷ 6)</p> <p>Find fractions of numbers, quantities or shapes (e.g. $\frac{1}{5}$ of 30 plums, $\frac{2}{3}$ of a 6 by 4 rectangle)</p> <p>Use a calculator to carry out one-step and two-step calculations involving all four operations; recognise negative numbers in the display, correct mistaken entries and interpret the display correctly in the context of money</p>	<p>Draw polygons and classify them by identifying their properties, including their line symmetry</p> <p>Visualise 3-D objects from 2-D drawings; make nets of common solids</p> <p>Recognise horizontal and vertical lines; use the eight compass points to describe direction; describe and identify the position of a square on a grid of squares</p> <p>Know that angles are measured in degrees and that one whole turn is 360°; compare and order angles less than 180°</p>	<p>Choose and use standard metric units and their abbreviations when estimating, measuring and recording length, weight and capacity; know the meaning of 'kilo', 'centi' and 'milli' and, where appropriate, use decimal notation to record measurements (e.g. 1.3 m or 0.6 kg)</p> <p>Interpret intervals and divisions on partially numbered scales and record readings accurately, where appropriate to the nearest tenth of a unit</p> <p>Draw rectangles and measure and calculate their perimeters; find the area of rectilinear shapes drawn on a square grid by counting squares</p> <p>Read time to the nearest minute; use am, pm, and 12-hour clock notation; choose units of time to measure time intervals; calculate time intervals from clocks and timetables</p>	<p>Answer a question by identifying what data to collect; organise, present, analyse and interpret the data in tables, diagrams, tally charts, pictograms and bar charts, using ICT where appropriate</p> <p>Compare the impact of representations where scales have intervals of differing step size</p>		
		<p>Level 2</p> <p>MA1 Pupils select the mathematics they use in some classroom activities. They discuss their work using mathematical language and are beginning to represent it using symbols and simple diagrams. They explain why an answer is correct.</p> <p>MA2 Pupils count sets of objects reliably, and use mental recall of addition and subtraction facts to 10. They begin to understand the place value of each digit in a number and use this to order numbers up to 100. They choose the appropriate operation when solving addition and subtraction problems. They use the knowledge that subtraction is the inverse of addition. They use mental calculation strategies to solve number problems involving money and measures. They recognise sequences of numbers, including odd and even numbers.</p> <p>MA3 Pupils use mathematical names for common 3-D and 2-D shapes and describe their properties, including numbers of sides and corners. They distinguish between straight and turning movements, understand angle as a measurement of turn, and recognise right angles in turns. They begin to use everyday non-standard and standard units to measure length and mass.</p> <p>MA4 Pupils sort objects and classify them using more than one criterion. When they have gathered information, pupils record results in simple lists, tables and block graphs, in order to communicate their findings.</p>	Year 3	<p>Solve one-step and two-step problems involving numbers, money or measures, including time, choosing and carrying out appropriate calculations</p> <p>Represent the information in a puzzle or problem using numbers, images or diagrams; use these to find a solution and present it in context, where appropriate using £, p notation or units of measure</p> <p>Follow a line of enquiry by deciding what information is important; make and use lists, tables and graphs to organise and interpret the information</p> <p>Identify patterns and relationships involving numbers or shapes, and use these to solve problems</p> <p>Describe and explain methods, choices and solutions to puzzles and problems, orally and in writing, using pictures and diagrams</p>	<p>Read, write and order whole numbers to at least 1000 and position them on a number line; count on from and back to zero in single-digit steps or multiples of 10</p> <p>Partition three-digit numbers into multiples of 100, 10 and 1 in different ways</p> <p>Round two-digit or three-digit numbers to the nearest 10 or 100 and give estimates for their sums and differences</p> <p>Read and write proper fractions (e.g. $\frac{3}{7}$, $\frac{2}{10}$), interpreting the denominator as the parts of a whole and the numerator as the number of parts; identify and estimate fractions of shapes; use diagrams to compare fractions and establish equivalents</p>	<p>Derive and recall all addition and subtraction facts for each number to 20, sums and differences of multiples of 10 and number pairs that total 100</p> <p>Derive and recall multiplication facts for the 2, 3, 4, 5, 6 and 10 times-tables and the corresponding division facts; recognise multiples of 2, 5 or 10 up to 1000</p> <p>Use knowledge of number operations and corresponding inverses, including doubling and halving, to estimate and check calculations</p>	<p>Add or subtract mentally combinations of one-digit and two-digit numbers</p> <p>Develop and use written methods to record, support or explain addition and subtraction of two-digit and three-digit numbers</p> <p>Multiply one-digit and two-digit numbers by 10 or 100, and describe the effect</p> <p>Use practical and informal written methods to multiply and divide two-digit numbers (e.g. 13 x 3, 50 ÷ 4); round remainders up or down, depending on the context</p> <p>Understand that division is the inverse of multiplication and vice versa; use this to derive and record related multiplication and division number sentences</p> <p>Find unit fractions of numbers and quantities (e.g. $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{6}$ of 12 litres)</p>	<p>Relate 2-D shapes and 3-D solids to drawings of them; describe, visualise, classify, draw and make the shapes</p> <p>Draw and complete shapes with reflective symmetry; draw the reflection of a shape in a mirror line along one side</p> <p>Read and record the vocabulary of position, direction and movement, using the four compass directions to describe movement about a grid</p> <p>Use a set-square to draw right angles and to identify right angles in 2-D shapes; compare angles with a right angle; recognise that a straight line is equivalent to two right angles</p>	<p>Know the relationships between kilometres and metres, metres and centimetres, kilograms and grams, litres and millilitres; choose and use appropriate units to estimate, measure and record measurements</p> <p>Read, to the nearest division and half-division, scales that are numbered or partially numbered; use the information to measure and draw to a suitable degree of accuracy</p> <p>Read the time on a 12-hour digital clock and to the nearest 5 minutes on an analogue clock; calculate time intervals and find start or end times for a given time interval</p>	<p>Answer a question by collecting, organising and interpreting data; use tally charts, frequency tables, pictograms and bar charts to represent results and illustrate observations; use ICT to create a simple bar chart</p> <p>Use Venn diagrams or Carroll diagrams to sort data and objects using more than one criterion</p>
				<p>Level 1</p> <p>MA1 Pupils use mathematics as an integral part of classroom activities. They represent their work with objects or pictures and discuss it. They recognise and use a simple pattern or relationship.</p> <p>MA2 Pupils count, order, add and subtract numbers when solving problems involving up to 10 objects. They read and write the numbers involved.</p> <p>MA3 When working with 2-D and 3-D shapes, pupils use everyday language to describe properties and positions. They measure and order objects using direct comparison, and order events.</p> <p>MA4 Pupils sort objects and classify them, demonstrating the criterion they have used.</p>	Year 2	<p>Solve problems involving addition, subtraction, multiplication or division in contexts of numbers, measures or pounds and pence</p> <p>Identify and record the information or calculation needed to solve a puzzle or problem; carry out the steps or calculations and check the solution in the context of the problem</p> <p>Follow a line of enquiry; answer questions by choosing and using suitable equipment and selecting, organising and presenting information in lists, tables and simple diagrams</p> <p>Describe patterns and relationships involving numbers or shapes, make predictions and test these with examples</p> <p>Present solutions to puzzles and problems in an organised way; explain decisions, methods and results in pictorial, spoken or written form, using mathematical language and number sentences</p>	<p>Read and write two-digit and three-digit numbers in figures and words; describe and extend number sequences and recognise odd and even numbers</p> <p>Count up to 100 objects by grouping them and counting in tens, fives or twos; explain what each digit in a two-digit number represents, including numbers where 0 is a place holder; partition two-digit numbers in different ways, including into multiples of 10 and 1</p> <p>Order two-digit numbers and position them on a number line; use the greater than (>) and less than (<) signs</p> <p>Estimate a number of objects; round two-digit numbers to the nearest 10</p> <p>Find one half, one quarter and three-quarters of shapes and sets of objects</p>	<p>Derive and recall all addition and subtraction facts for each number to at least 10, all pairs with totals to 20 and all pairs of multiples of 10 with totals up to 100</p> <p>Understand that halving is the inverse of doubling and derive and recall doubles of all numbers to 20, and the corresponding halves</p> <p>Derive and recall multiplication facts for the 2, 5 and 10 times-tables and the related division facts; recognise multiples of 2, 5 and 10</p> <p>Use knowledge of number facts and operations to estimate and check answers to calculations</p>	<p>Add or subtract mentally a one-digit number or a multiple of 10 to or from any two-digit number; use practical and informal written methods to add and subtract two-digit numbers</p> <p>Understand that subtraction is the inverse of addition and vice versa; use this to derive and record related addition and subtraction number sentences</p> <p>Represent repeated addition and arrays as multiplication, and sharing and repeated subtraction (grouping) as division; use practical and informal written methods and related vocabulary to support multiplication and division, including calculations with remainders</p> <p>Use the symbols +, -, x, ÷ and = to record and interpret number sentences involving all four operations; calculate the value of an unknown in a number sentence (e.g. $\square + 2 = 6$, $30 - \square = 24$)</p>	<p>Visualise common 2-D shapes and 3-D solids; identify shapes from pictures of them in different positions and orientations; sort, make and describe shapes, referring to their properties</p> <p>Identify reflective symmetry in patterns and 2-D shapes and draw lines of symmetry in shapes</p> <p>Follow and give instructions involving position, direction and movement</p> <p>Recognise and use whole, half and quarter turns, both clockwise and anticlockwise; know that a right angle represents a quarter turn</p>
<p>Key</p> <p>MA1 Attainment target 1: using and applying mathematics</p> <p>MA2 Attainment target 2: number and algebra</p> <p>MA3 Attainment target 3: shape, space and measures</p> <p>MA4 Attainment target 4: handling data</p>	Year 1					<p>Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change'</p> <p>Describe a puzzle or problem using numbers, practical materials and diagrams; use these to solve the problem and set the solution in the original context</p> <p>Answer a question by selecting and using suitable equipment, and sorting information, shapes or objects; display results using tables and pictures</p> <p>Describe simple patterns and relationships involving numbers or shapes; decide whether examples satisfy given conditions</p> <p>Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures</p>	<p>Count reliably at least 20 objects, recognising that when rearranged the number of objects stays the same; estimate a number of objects that can be checked by counting</p> <p>Compare and order numbers, using the related vocabulary; use the equals (=) sign</p> <p>Read and write numerals from 0 to 20, then beyond; use knowledge of place value to position these numbers on a number track and number line</p> <p>Say the number that is 1 more or less than any given number, and 10 more or less for multiples of 10</p> <p>Use the vocabulary of halves and quarters in context</p>	<p>Derive and recall all pairs of numbers with a total of 10 and addition facts for totals to at least 5; work out the corresponding subtraction facts</p> <p>Count on or back in ones, twos, fives and tens and use this knowledge to derive the multiples of 2, 5 and 10 to the tenth multiple</p> <p>Recall the doubles of all numbers to at least 10</p>	<p>Relate addition to counting on; recognise that addition can be done in any order; use practical and informal written methods to support the addition of a one-digit number or a multiple of 10 to a one-digit or two-digit number</p> <p>Understand subtraction as 'take away' and find a 'difference' by counting up; use practical and informal written methods to support the subtraction of a one-digit number from a one-digit or two-digit number and a multiple of 10 from a two-digit number</p> <p>Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences</p> <p>Solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups</p>	<p>Visualise and name common 2-D shapes and 3-D solids and describe their features; use them to make patterns, pictures and models</p> <p>Identify objects that turn about a point (e.g. scissors) or about a line (e.g. a door); recognise and make whole, half and quarter turns</p> <p>Visualise and use everyday language to describe the position of objects and direction and distance when moving them, for example when placing or moving objects on a game board</p>
		<p>Foundation Stage</p>	<p>Use developing mathematical ideas and methods to solve practical problems</p> <p>Match sets of objects to numerals that represent the number of objects</p> <p>Sort objects, making choices and justifying decisions</p> <p>Talk about, recognise and recreate simple patterns</p> <p>Describe solutions to practical problems, drawing on experience, talking about their own ideas, methods and choices</p>			<p>Say and use number names in order in familiar contexts</p> <p>Know that numbers identify how many objects are in a set</p> <p>Count reliably up to 10 everyday objects</p> <p>Estimate how many objects they can see and check by counting</p> <p>Count aloud in ones, twos, fives and tens</p> <p>Use language such as 'more' or 'less' to compare two numbers</p> <p>Use ordinal numbers in different contexts</p> <p>Recognise numerals 1 to 9</p>	<p>Observe number relationships and patterns in the environment and use these to derive facts</p> <p>Find one more or one less than a number from 1 to 10</p> <p>Select two groups of objects to make a given total of objects</p>	<p>Begin to relate addition to combining two groups of objects and subtraction to 'taking away'</p> <p>In practical activities and discussion begin to use the vocabulary involved in adding and subtracting</p> <p>Count repeated groups of the same size</p> <p>Share objects into equal groups and count how many there are in each group</p>	<p>Use familiar objects and common shapes to create and recreate patterns and build models</p> <p>Use language such as 'circle' or 'bigger' to describe the shape and size of solids and flat shapes</p> <p>Use everyday words to describe position</p>	<p>Use language such as 'greater', 'smaller', 'heavier' or 'lighter' to compare quantities</p> <p>Use everyday language related to time; order and sequence familiar events and measure short periods of time</p>

Statements in **bold** refer to the early learning goals in the Foundation Stage or to key objectives.

More detailed guidance on assessment for learning can be found on the Primary Framework website.

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