

Using and applying mathematics			
	Problem solving	Communicating	Reasoning
<b>L4</b>	<ul style="list-style-type: none"> <li>develop own strategies for solving problems, e.g.                             <ul style="list-style-type: none"> <li><i>make their own suggestions of ways to tackle a range of problems</i></li> <li><i>make connections to previous work</i></li> <li><i>pose and answer questions related to a problem</i></li> <li><i>check answers and ensure solutions make sense in the context of the problem</i></li> <li><i>review their work and approaches</i></li> </ul> </li> <li>use their own strategies within mathematics and in applying mathematics to practical context                             <ul style="list-style-type: none"> <li><i>use mathematical content from levels 3 and 4 to solve problems and investigate</i></li> </ul> </li> </ul> <p style="text-align: right;">Level 4 <input type="checkbox"/></p>	<ul style="list-style-type: none"> <li>present information and results in a clear and organised way, e.g.                             <ul style="list-style-type: none"> <li><i>organise written work, e.g. record results in order</i></li> <li><i>begin to work in an organised way from the start</i></li> <li><i>consider appropriate units</i></li> <li><i>use related vocabulary accurately</i></li> </ul> </li> </ul> <p style="text-align: right;">Level 4 <input type="checkbox"/></p>	<ul style="list-style-type: none"> <li>search for a solution by trying out ideas of their own, e.g.                             <ul style="list-style-type: none"> <li><i>check their methods and justify answers</i></li> <li><i>identify patterns as they work and form their own generalisations/rules in words</i></li> </ul> </li> </ul> <p style="text-align: right;">Level 4 <input type="checkbox"/></p>
<b>L3</b>	<ul style="list-style-type: none"> <li>select the mathematics they use in a wider range of classroom activities, e.g.                             <ul style="list-style-type: none"> <li><i>use classroom discussions to break into a problem, recognising similarities to previous work</i></li> <li><i>put the problem into their own words</i></li> <li><i>use mathematical content from levels 2 and 3</i></li> <li><i>choose their own equipment appropriate to the task, including calculators</i></li> </ul> </li> <li>try different approaches and find ways of overcoming difficulties that arise when they are solving problems, e.g.                             <ul style="list-style-type: none"> <li><i>check their work and make appropriate corrections, e.g. decide that two numbers less than 100 cannot give a total more than 200 and correct the addition</i></li> <li><i>begin to look for patterns in results as they work and use them to find other possible outcomes</i></li> </ul> </li> </ul> <p style="text-align: right;">Level 3 <input type="checkbox"/></p>	<ul style="list-style-type: none"> <li>begin to organise their work and check results, e.g.                             <ul style="list-style-type: none"> <li><i>begin to develop own ways of recording</i></li> <li><i>develop an organised approach as they get into recording their work on a problem</i></li> </ul> </li> <li>discuss their mathematical work and begin to explain their thinking, e.g.                             <ul style="list-style-type: none"> <li><i>use appropriate mathematical vocabulary</i></li> <li><i>talk about their findings by referring to their written work</i></li> </ul> </li> <li>use and interpret mathematical symbols and diagrams</li> </ul> <p style="text-align: right;">Level 3 <input type="checkbox"/></p>	<ul style="list-style-type: none"> <li>understand a general statement by finding particular examples that match it, e.g.                             <ul style="list-style-type: none"> <li><i>make a generalisation with the assistance of probing questions and prompts</i></li> </ul> </li> <li>review their work and reasoning, e.g.                             <ul style="list-style-type: none"> <li><i>respond to 'What if?' questions</i></li> <li><i>when they have solved a problem, pose a similar problem for a partner</i></li> </ul> </li> </ul> <p style="text-align: right;">Level 3 <input type="checkbox"/></p>
	Insufficient evidence <input type="checkbox"/>	Insufficient evidence <input type="checkbox"/>	Insufficient evidence <input type="checkbox"/>

**Ma1 overall level** Read the complete level descriptions overleaf to confirm the level. Then consider whether the level is low, secure or high.

Level 3		
low	secure	high

Level 4		
low	secure	high

**Ma1 Using and applying mathematics, level 4**

Pupils are developing their own strategies for solving problems and are using these strategies both in working within mathematics and in applying mathematics to practical contexts. They present information and results in a clear and organised way. They search for a solution by trying out ideas of their own.

**Ma1 Using and applying mathematics, level 3**

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.

		Calculating					
Counting and understanding numbers		Knowing and using number facts				Solving numerical problems	
Numbers and the number system	Fractions, decimals, percentages and ratio	Operations, relationships between them	Mental methods	Solving numerical problems	Written and calculator methods		
L4	<ul style="list-style-type: none"> <li>recognise and describe number patterns, e.g. <i>continue sequences involving decimals</i></li> <li>recognise and describe number relationships including multiple, factor and square</li> <li>use place value to multiply and divide whole numbers by 10 or 100</li> </ul>	<ul style="list-style-type: none"> <li>recognise approximate proportions of a whole and use simple fractions and percentages to describe these</li> <li><i>recognise simple equivalence between fractions, decimals and percentages e.g. <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{10}</math>, <math>\frac{3}{4}</math></i></li> <li><i>convert mixed numbers to improper fractions and vice versa</i></li> <li>order decimals to three decimal places</li> <li>begin to understand simple ratio</li> </ul>	<ul style="list-style-type: none"> <li>use inverse operations, e.g. <i>use a calculator and inverse operations to find missing numbers, including decimals</i></li> <li><i>'undo' two-step problems between fractions, decimals and percentages e.g. <math>20 + \square = 100 \div 4</math></i></li> <li>understand the use of brackets in simple calculations</li> <li>quickly derive division facts that correspond to multiplication facts up to <math>10 \times 10</math></li> </ul>	<ul style="list-style-type: none"> <li>use a range of mental methods of computation with the four operations, e.g. <i>calculate complements to 1000</i></li> <li>recall multiplication facts up to <math>10 \times 10</math> and quickly derive corresponding division facts, e.g. <i>use their knowledge of tables and place value in calculations with multiples of 10 such as <math>30 \times 7</math>, <math>180 \div 3</math></i></li> </ul>	<ul style="list-style-type: none"> <li>solve problems with or without a calculator</li> <li><i>solve two-step problems choosing appropriate operations</i></li> <li><i>deal with two constraints simultaneously</i></li> <li><i>interpret a calculator display of 4.5 as £4.50 in context of money</i></li> <li><i>carry out simple calculations involving negative numbers in context</i></li> <li>check the reasonableness of results with reference to the context or size of numbers</li> <li>begin to use simple formulae expressed in words</li> <li>use and interpret coordinates in the first quadrant</li> </ul>	<ul style="list-style-type: none"> <li>use efficient written methods of addition and subtraction and of short multiplication and division e.g. <i>calculate <math>1202 + 45 + 367</math> or <math>1025 - 336</math></i></li> <li>add and subtract decimals to two places</li> <li>multiply a simple decimal by a single digit, e.g. <i>calculate <math>36.2 \times 8</math></i></li> </ul>	
	Level 4	Level 4	Level 4	Level 4	Level 4	Level 4	
L3	<ul style="list-style-type: none"> <li>understand place value in numbers to 1000, e.g. <i>represent/compare numbers using number lines, 100-squares, base 10 materials, etc.</i></li> <li><i>recognise that some numbers can be represented as different arrays</i></li> <li><i>use understanding of place value to multiply/divide whole numbers by 10 (whole number answers)</i></li> <li>use place value to make approximations</li> <li>recognise negative numbers in contexts such as temperature</li> <li>recognise a wider range of sequences, e.g. <i>recognise sequences of multiples of 2, 5 and 10</i></li> </ul>	<ul style="list-style-type: none"> <li>use simple fractions that are several parts of a whole and recognise when two simple fractions are equivalent, e.g. <i>understand and use unit fractions such as <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{3}</math>, <math>\frac{1}{5}</math>, <math>\frac{1}{10}</math> and find those fractions of shapes and sets of objects</i></li> <li><i>recognise and record fractions that are several parts of the whole such as <math>\frac{3}{4}</math>, <math>\frac{2}{5}</math></i></li> <li><i>recognise some fractions that are equivalent to <math>\frac{1}{2}</math></i></li> <li>begin to use decimal notation in contexts such as money, e.g. <i>order decimals with one dp, or two dp in context of money</i></li> <li><i>know that £3.06 equals 306p</i></li> </ul>	<ul style="list-style-type: none"> <li>derive associated division facts from known multiplication facts, e.g. <i>given a number sentence, use understanding of operations to create related sentences, e.g. given <math>14 \times 5 = 70</math>, create <math>5 \times 14 = 70</math>, <math>70 \div 5 = 14</math>, <math>70 \div 14 = 5</math>, <math>14 \times 5 = 10 \times 5</math> add <math>4 \times 5</math></i></li> <li><i>use inverses to find missing whole numbers in problems such as 'I think of a number, double it and add 5. The answer is 35. What was my number?'</i></li> <li>begin to understand the role of <math>\neq</math> the <math>\neq</math>quals sign, e.g. <i>solve 'balancing' problems such as <math>7 \times 10 = 82 - \square</math></i></li> </ul>	<ul style="list-style-type: none"> <li>add and subtract two-digit numbers mentally, e.g. <i>calculate <math>36 + 19</math>, <math>63 - 26</math>, and complements to 100 such as <math>100 - 24</math></i></li> <li>use mental recall of the 2, 3, 4, 5 and 10 multiplication tables, e.g. <i>multiply a two-digit number by 2, 3, 4 or 5</i></li> <li><i>understand finding a quarter of a number of objects as halving the number and halving again</i></li> <li><i>begin to know multiplication facts for <math>\times 6</math>, <math>\times 8</math>, <math>\times 9</math> and <math>\times 7</math> tables</i></li> </ul>	<ul style="list-style-type: none"> <li>use mental recall of addition and subtraction facts to 20 in solving problems involving larger numbers, e.g. <i>choose to calculate mentally, on paper or with apparatus</i></li> <li><i>solve one-step whole number problems appropriately</i></li> <li><i>solve two-step problems that involve addition and subtraction</i></li> <li>solve whole number problems including those involving multiplication or division that may give rise to remainders, e.g. <i>identify appropriate operations to use</i></li> <li><i>round up or down after simple division, depending on context</i></li> </ul>	<ul style="list-style-type: none"> <li>add and subtract three-digit numbers using written method, e.g. <i>use written methods that involve bridging 10 or 100</i></li> <li><i>add and subtract decimals in the context of money, where bridging is not required</i></li> <li>multiply and divide two-digit numbers by 2, 3, 4 or 5 as well as 10 with whole number answers and remainders, e.g. <i>calculate <math>49 \div 3</math></i></li> </ul>	
	Level 3	Level 3	Level 3	Level 3	Level 3	Level 3	
Insufficient evidence		Insufficient evidence		Insufficient evidence		Insufficient evidence	

Ma2 overall level Read the complete level descriptions overleaf to confirm the level. Then consider whether the level is low, secure or high.

Level 3		
low	secure	high

Level 4		
low	secure	high

**Ma2 Number, level 4**

Pupils use their understanding of place value to multiply and divide whole numbers by 10 or 100. In solving number problems, pupils use a range of mental methods of computation with the four operations, including mental recall of multiplication facts up to  $10 \times 10$  and quick derivation of corresponding division facts. They use efficient written methods of addition and subtraction and of short multiplication and division. They add and subtract decimals to two places and order decimals to three places. In solving problems with or without a calculator, pupils check the reasonableness of their results by reference to their knowledge of the context or to the size of the numbers. They recognise approximate proportions of a whole and use simple fractions and percentages to describe these. Pupils recognise and describe number patterns, and relationships including multiple, factor and square. They begin to use simple formulae expressed in words. Pupils use and interpret coordinates in the first quadrant.

**Ma2 Number, level 3**

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.

	Understanding shapes		Measuring		
	Properties of shape	Properties of position and movement	Measures		
<b>L4</b>	<ul style="list-style-type: none"> <li>use the properties of 2-D and 3-D shapes, e.g.                             <ul style="list-style-type: none"> <li>recognise and name most quadrilaterals, e.g. trapezium, parallelogram, rhombus</li> <li>recognise right-angled, equilateral, isosceles and scalene triangles</li> <li>recognise an oblique line of symmetry in a shape</li> <li>use mathematical terms such as horizontal, vertical, congruent (same size, same shape)</li> <li>understand properties of shapes, e.g. why a square is a special rectangle</li> <li>visualise shapes and recognise them in different orientations</li> </ul> </li> <li>make 3-D models by linking given faces or edges</li> </ul>	<ul style="list-style-type: none"> <li>draw common 2-D shapes in different orientations on grids, e.g.                             <ul style="list-style-type: none"> <li>complete a rectangle which has two sides drawn at an oblique angle to the grid</li> </ul> </li> <li>reflect simple shapes in a mirror line, e.g.                             <ul style="list-style-type: none"> <li>use a grid to plot the reflection in a mirror line presented at 45° where the shape touches the line or not</li> <li>begin to use the distance of vertices from the mirror line to reflect shapes more accurately</li> </ul> </li> <li>begin to rotate a simple shape or object about its centre or a vertex</li> <li>translate shapes horizontally or vertically</li> </ul>	<ul style="list-style-type: none"> <li>choose and use appropriate units and instruments</li> <li>interpret, with appropriate accuracy, numbers on a range of measuring instruments, e.g.                             <ul style="list-style-type: none"> <li>measure a length using mm, to within 2 mm</li> <li>measure and draw acute and obtuse angles to the nearest 5°, when one edge is horizontal/vertical</li> </ul> </li> <li>find perimeters of simple shapes and find areas by counting squares, e.g.                             <ul style="list-style-type: none"> <li>use the terms 'area' and 'perimeter' accurately and consistently</li> <li>find areas by counting squares and part squares</li> <li>begin to find the area of shapes that need to be divided into rectangles</li> <li>use 'number of squares in a row times number of rows' to find the area of a rectangle</li> </ul> </li> <li>use units of time, e.g.                             <ul style="list-style-type: none"> <li>calculate time durations that go over the hour</li> <li>read and interpret timetables</li> </ul> </li> </ul>	Level 4	Level 4
<b>L3</b>	<ul style="list-style-type: none"> <li>classify 3-D and 2-D shapes in various ways using mathematical properties such as reflective symmetry for 2-D shapes, e.g.                             <ul style="list-style-type: none"> <li>sort objects and shapes using more than one criterion, e.g. pentagon, not pentagon and all edges the same length/not the same length</li> <li>sort the shapes which have all edges the same length and all angles the same size from a set of mixed shapes and begin to understand the terms 'regular' and 'irregular'</li> <li>recognise right angles in shapes in different orientations</li> <li>recognise angles which are bigger/smaller than 90° and begin to know the terms 'obtuse' and 'acute'</li> <li>recognise right-angled and equilateral triangles</li> <li>demonstrate that a shape has reflection symmetry by folding and recognise when a shape does not have a line of symmetry</li> <li>recognise common 3-D shapes, e.g. triangular prism, square-based pyramid</li> <li>relate 3-D shapes to drawings and photographs of them, including from different viewpoints</li> </ul> </li> <li>begin to recognise nets of familiar 3-D shapes, e.g. cube, cuboid, triangular prism, square-based pyramid</li> </ul>	<ul style="list-style-type: none"> <li>recognise shapes in different orientations</li> <li>reflect shapes, presented on a grid, in a vertical or horizontal mirror line, e.g.                             <ul style="list-style-type: none"> <li>reflect a shape even if the shape is at 45° to the mirror line, touching the line or not</li> <li>begin to reflect simple shapes in a mirror line presented at 45°</li> </ul> </li> <li>describe position and movement, e.g.                             <ul style="list-style-type: none"> <li>use terms such as left/right, clockwise/anticlockwise, quarter turn/90° to give directions along a route</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>use non-standard units and standard metric units of length, capacity and mass in a range of contexts, e.g.                             <ul style="list-style-type: none"> <li>measure a length to the nearest 1/2 cm</li> <li>read simple scales, e.g. increments of 2, 5 or 10</li> </ul> </li> <li>use standard units of time, e.g.                             <ul style="list-style-type: none"> <li>read a 12-hour clock and generally calculate time durations that do not go over the hour</li> </ul> </li> <li>use a wider range of measures, e.g.                             <ul style="list-style-type: none"> <li>begin to understand area as a measure of surface and perimeter as a measure of length</li> <li>begin to find areas of shapes by counting squares and explain answers as a number of squares even if not using standard units such as cm<sup>2</sup> or m<sup>2</sup></li> <li>recognise angles as a measure of turn and know that one whole turn is 360 degrees</li> </ul> </li> </ul>	Level 3	Level 3
	Insufficient evidence	Insufficient evidence	Insufficient evidence		

**Ma3 overall level** Read the complete level descriptions overleaf to confirm the level. Then consider whether the level is low, secure or high.

Level 3		
low	secure	high

Level 4		
low	secure	high

**Ma3 Shape, space and measures, level 4**

Pupils make 3-D mathematical models by linking given faces or edges, draw common 2-D shapes in different orientations on grids. They reflect simple shapes in a mirror line. They choose and use appropriate units and instruments, interpreting, with appropriate accuracy, numbers on a range of measuring instruments. They find perimeters of simple shapes and find areas by counting squares.

**Ma3 Shape, space and measures, level 3**

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.

		Handling data and Using and applying mathematics	
		Processing and representing data	Interpreting data
L4	<ul style="list-style-type: none"> <li>• collect discrete data, e.g.                             <ul style="list-style-type: none"> <li>. <i>given a problem, suggest possible answers and data to collect</i></li> <li>. <i>test a hypothesis about the frequency of an event by collecting data, e.g. collect dice scores to test ideas about how many scores of 6 will occur during 50 throws of a dice</i></li> </ul> </li> <li>• group data, where appropriate, in equal class intervals, e.g.                             <ul style="list-style-type: none"> <li>. <i>decide on a suitable class interval when collecting or representing data about pupils' hours per week spent watching TV</i></li> </ul> </li> <li>• record discrete data using a frequency table</li> <li>• represent collected data in frequency diagrams, e.g.                             <ul style="list-style-type: none"> <li>. <i>suggest an appropriate frequency diagram to represent particular data, e.g. decide whether a bar chart, Venn diagram or pictogram would be most appropriate and for pictograms use one symbol to represent, say, 2, 5, 10 or 100</i></li> </ul> </li> <li>• construct simple line graphs                             <ul style="list-style-type: none"> <li>. <i>decide upon an appropriate scale for a graph, e.g. labelled divisions representing 2, 5, 10, 100</i></li> </ul> </li> <li>• continue to use Venn and Carroll diagrams to record their sorting and classifying of information, e.g.                             <ul style="list-style-type: none"> <li>. <i>represent sorting using two criteria typical of level 3 and 4 mathematics such as sorting numbers using properties 'multiples of 8' and 'multiples of 6'</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• understand and use the mode and range to describe sets of data                             <ul style="list-style-type: none"> <li>. <i>use mode and range to describe data relating to shoe sizes in their class and begin to compare their data with data from another class</i></li> </ul> </li> <li>• interpret frequency diagrams and simple line graphs                             <ul style="list-style-type: none"> <li>. <i>interpret simple pie charts</i></li> <li>. <i>interpret the scale on bar graphs and line graphs, reading between the labelled divisions, e.g. reading 17 on a scale labelled in fives</i></li> <li>. <i>interpret the total amount of data represented</i></li> <li>. <i>compare data sets and respond to questions, e.g. 'How does our data about favourite TV programmes compare to the data from Year 3 children?'</i></li> <li>. <i>in the context of data relating to everyday situations, understand the language of probability such as 'more likely, equally likely, fair, unfair, certain'</i></li> </ul> </li> </ul>	
	Level 4	Level 4	
L3	<ul style="list-style-type: none"> <li>• gather information, e.g.                             <ul style="list-style-type: none"> <li>. <i>decide what data to collect to answer a question, e.g. what is the most common way to travel to school</i></li> <li>. <i>make appropriate choices for recording data, e.g. a tally chart or frequency table</i></li> </ul> </li> <li>• construct bar charts and pictograms, where the symbol represents a group of units, e.g.                             <ul style="list-style-type: none"> <li>. <i>decide how best to represent data, e.g. whether a bar chart, Venn diagram or pictogram would show the information most clearly</i></li> <li>. <i>decide upon an appropriate scale for a graph, e.g. labelled divisions of 2, or, for a pictogram, one symbol to represent 2 or 5</i></li> </ul> </li> <li>• use Venn and Carroll diagrams to record their sorting and classifying of information, e.g.                             <ul style="list-style-type: none"> <li>. <i>represent sorting using one or two criteria typical of level 2 and 3 mathematics, e.g. shapes sorted using properties such as right angles and equal sides</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• extract and interpret information presented in simple tables, lists, bar charts and pictograms, e.g.                             <ul style="list-style-type: none"> <li>. <i>use a key to interpret represented data</i></li> <li>. <i>read scales labelled in twos, fives and tens, including reading between labelled divisions such as a point halfway between 40 and 50 or 8 and 10</i></li> <li>. <i>compare data, e.g. say how many more... than... and recognise the category that has most/least</i></li> <li>. <i>respond to questions of a more complex nature such as 'How many children took part in this survey altogether?' or 'How would the data differ if we asked the children in Year 6?'</i></li> <li>. <i>in the context of data relating to everyday situations, understand the idea of 'certain' and 'impossible' relating to probability</i></li> </ul> </li> </ul>	
	Level 3	Level 3	
	Insufficient evidence	Insufficient evidence	

**Ma4 overall level** Read the complete level descriptions overleaf to confirm the level. Then consider whether the level is low, secure or high.

Level 3		
low	secure	high

Level 4		
low	secure	high

**Ma4 Handling data, level 4**

Pupils collect discrete data and record them using a frequency table. They understand and use the mode and range to describe sets of data. They group data, where appropriate, in equal class intervals, represent collected data in frequency diagrams and interpret such diagrams. They construct and interpret simple line graphs.

**Ma4 Handling data, level 3**

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.