

Ma 1 Using and applying mathematics						
Problem solving		Communicating		Reasoning		
L1	<ul style="list-style-type: none"> <li>◆ use mathematics as an integral part of classroom activities, e.g. with support</li> <li>- engage with practical mathematical activities involving sorting, counting and measuring by direct comparison</li> <li>- begin to understand the relevance of mathematical ideas to everyday situations by using them in role play</li> </ul>	<ul style="list-style-type: none"> <li>◆ represent their work with objects or pictures</li> <li>◆ discuss their work, e.g. with support</li> <li>- respond to questions and ideas from peers and adults</li> <li>- refer to the materials they have used and talk about what they have done, patterns they have noticed, etc</li> </ul>	<ul style="list-style-type: none"> <li>◆ draw simple conclusions from their work e.g. with support</li> <li>- describe the different ways they have sorted objects, what is the same about objects in a set, how sets differ</li> <li>- Identify which set has most, which object is biggest, smallest, tallest etc</li> <li>- Explain numbers and calculations, how many altogether, how many used or hidden, how many left, how many each, etc.</li> <li>◆ recognise and use a simple pattern or relationship, e.g. with support</li> <li>- copy and continue a simple pattern of objects, shapes or numbers</li> </ul>			
Ma2 Number			Calculating			
Counting and understanding numbers		Knowing and using number facts				
Numbers and the number system		Fractions	Operations, relationships between them	Mental methods	Solving numerical problems	Written methods
L1	<ul style="list-style-type: none"> <li>◆ count up to 10 objects, e.g.</li> <li>- estimate and check a number</li> <li>◆ read, write numbers to 10</li> <li>- perhaps with some reversal</li> <li>◆ order numbers to 10</li> <li>- say what number comes next, is one more / less</li> <li>- count back to zero</li> <li>- place 1–10 into ascending order</li> <li>- point to first, second.. etc in a line</li> <li>- begin to count in twos</li> </ul>	<ul style="list-style-type: none"> <li>◆ begin to use the fraction, one-half, e.g.</li> <li>- halve shapes including folding paper shapes, lengths of string</li> <li>- put water in a clear container so that it is about 'half-full'</li> <li>- halve an even number of objects</li> </ul>	<ul style="list-style-type: none"> <li>◆ understand addition as finding the total of two or more sets of objects</li> <li>◆ understand subtraction as 'taking away' objects from a set and finding how many are left</li> </ul>	<ul style="list-style-type: none"> <li>◆ add and subtract numbers of objects to 10</li> <li>- begin to add by counting on from the number of objects in the first set</li> <li>◆ begin to know some addition facts e.g.</li> <li>- doubles of numbers to double 5</li> </ul>	<ul style="list-style-type: none"> <li>◆ solve addition / subtraction problems involving up to 10 objects, e.g.</li> <li>- given a number work out 'how many more to make...'</li> <li>- choose which of given pairs of numbers add to a given total</li> <li>- solve measuring problems such as how many balance with...</li> <li>- solve problems involving 1p or £1 coins</li> </ul>	<ul style="list-style-type: none"> <li>◆ record their work, e.g.</li> <li>- record their work with objects, pictures or diagrams</li> <li>- begin to use the symbols '+' and '=' to record additions</li> </ul>
Ma 3 Shape, Space and Measures-Understanding shapes					Measuring	
Properties of shape		Properties of position and movement		Measures		
L1	<ul style="list-style-type: none"> <li>◆ use everyday language to describe properties of 2-D and 3-D shapes, e.g.</li> <li>- sort shapes and say how they have selected them</li> <li>- use properties such as large, small, triangles, roll, stack</li> <li>- begin to refer to some features of shapes such as side and corner</li> <li>- begin to name the shapes they use in the context of an activity</li> </ul>	<ul style="list-style-type: none"> <li>◆ use everyday language to describe positions of 2-D and 3-D shapes</li> <li>- respond to and use positional language e.g. 'behind', 'under', 'on top of', 'next to', 'in between'...</li> <li>- respond to and use directional language in talk about objects and movement e.g. 'forwards', 'backwards', 'turn'</li> </ul>	<ul style="list-style-type: none"> <li>◆ measure and order objects using direct comparison</li> <li>- compare lengths directly and put them in order</li> <li>- respond to and use the language of comparison; longer, longest, shorter, shortest, more, less, heavier, lighter</li> <li>- check which of two objects is heavier/lighter and begin to put three objects into order</li> <li>- find objects that are longer/shorter than a metre, heavier/lighter than 500 grams, hold more/less than 1 litre</li> <li>◆ order events</li> <li>- order everyday events and describe the sequence</li> <li>- use the vocabulary of time including days of the week</li> <li>- read the time on an analogue clock at the hour and begin to know the half hour</li> </ul>			
Ma 4-Handling data and Using and applying mathematics						
Processing and representing data			Interpreting data			
L1	<ul style="list-style-type: none"> <li>◆ sort and classify objects, e.g.</li> <li>- sort using one criterion or sort into disjoint sets using two simple criteria such as boy / girl or thick / thin</li> <li>- sort objects again using a different criterion</li> <li>- sort objects into a given large scale Venn or Carroll diagram</li> <li>◆ represent their work, e.g.</li> <li>- use the objects they have sorted as a record</li> <li>- use objects/pictures to create simple block graphs</li> </ul>	<ul style="list-style-type: none"> <li>◆ demonstrate the criterion they have used, e.g.</li> <li>- respond to questions about how they have sorted objects and why each object belongs in a set</li> <li>- talk about which set has most, for example 'most children stayed at school for lunch'</li> <li>- talk about how they have represented their work</li> </ul>				

Ma 1 Using and applying mathematics						
Problem solving		Communicating		Reasoning		
L2	<ul style="list-style-type: none"> <li>select the mathematics they use in some classroom activities, e.g. with support               <ul style="list-style-type: none"> <li>find a starting point, identifying key facts / relevant information</li> <li>use apparatus, diagrams, role play etc to represent and clarify a problem</li> <li>move between different representations of a problem e.g. a situation described in words, a diagram etc.</li> <li>adopt a suggested model or systematic approach</li> <li>make connections and apply their knowledge to similar situations</li> <li>use mathematical content from levels 1 and 2 to solve problems and investigate</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>discuss their work using mathematical language, e.g. with support               <ul style="list-style-type: none"> <li>describe the strategies and methods they use in their work</li> <li>engage with others' explanations, compare... evaluate...</li> </ul> </li> <li>begin to represent their work using symbols and simple diagrams, e.g. with support               <ul style="list-style-type: none"> <li>use pictures, diagrams and symbols to communicate their thinking, or demonstrate a solution or process</li> <li>begin to appreciate the need to record and develop their own methods of recording</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>explain why an answer is correct, e.g. with support               <ul style="list-style-type: none"> <li>test a statement such as, 'The number twelve ends with a 2 so 12 sweets can be shared equally by 2 children'</li> </ul> </li> <li>predict what comes next in a simple number, shape or spatial pattern or sequence and give reasons for their opinions</li> </ul>			
	Ma2 Number			Calculating		
Counting and understanding numbers		Knowing and using number facts		Solving numerical problems		
Numbers and the number system		Fractions	Operations, relationships between them	Mental methods	Written methods	
L2	<ul style="list-style-type: none"> <li>count sets of objects reliably, e.g.               <ul style="list-style-type: none"> <li>group objects in tens, twos or fives to count them</li> </ul> </li> <li>begin to understand the place value of each digit, use this to order numbers up to 100, e.g.               <ul style="list-style-type: none"> <li>know the relative size of numbers to 100</li> <li>use 0 as a place holder</li> <li>demonstrate knowledge using a range of models/images</li> </ul> </li> <li>recognise sequences of numbers, including odd and even numbers, e.g.               <ul style="list-style-type: none"> <li>continue a sequence that increases or decreases in regular steps</li> <li>recognise numbers from counting in tens or twos</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>begin to use halves and quarters, e.g.               <ul style="list-style-type: none"> <li>use the concept of a fraction of a small quantity in a practical context such as sharing sweets between two and getting <math>\frac{1}{2}</math> each, among four and getting <math>\frac{1}{4}</math> each</li> <li>work out halves of numbers up to 20 and beginning to recall them</li> </ul> </li> <li>relate the concept of half of a small quantity to the concept of half of a shape, e.g.               <ul style="list-style-type: none"> <li>shade one half or one quarter of a given shape including those divided into equal regions</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>use the knowledge that subtraction is the inverse of addition e.g.               <ul style="list-style-type: none"> <li>begin to understand subtraction as 'difference'</li> <li>given 14, 6 and 8, make related number sentences <math>6 + 8 = 14</math>, <math>14 - 8 = 6</math>, <math>8 + 6 = 14</math>, <math>14 - 6 = 8</math></li> </ul> </li> <li>understand halving as a way of 'undoing' doubling and vice versa</li> </ul>	<ul style="list-style-type: none"> <li>use mental recall of addition and subtraction facts to 10 e.g.               <ul style="list-style-type: none"> <li>use addition/subtraction facts to 10 and place value to add or subtract multiples of 10 e.g. <math>30 + 7 = 10</math> and use place value to derive <math>30 + 70 = 100</math>.</li> </ul> </li> <li>use mental calculation strategies to solve number problems including those involving money and measures, e.g.               <ul style="list-style-type: none"> <li>recall doubles to 10+10 and other significant doubles e.g. double 50p is 100p or £1</li> <li>use knowledge of doubles to 10 + 10 to derive corresponding halves</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>choose the appropriate operation when solving addition and subtraction problems               <ul style="list-style-type: none"> <li>use repeated addition to solve multiplication problems</li> <li>begin to use repeated subtraction or sharing equally to solve division problems</li> </ul> </li> <li>solve number problems involving money and measures e.g.               <ul style="list-style-type: none"> <li>add/subtract two-digit and one-digit numbers, bridging tens where necessary in contexts using units such as pence, pounds, centimetres</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>record their work in writing, e.g.               <ul style="list-style-type: none"> <li>record their mental calculations as number sentences</li> </ul> </li> </ul>
	Ma 3 Shape, Space and Measures-Understanding shapes				Measuring	
Properties of shape		Properties of position and movement		Measures		
L2	<ul style="list-style-type: none"> <li>use mathematical names for common 3-D and 2-D shapes, e.g.               <ul style="list-style-type: none"> <li>identify 2-D and 3-D shapes from pictures of them in different orientations, e.g. square, triangle, hexagon, pentagon, octagon, cube, cylinder, sphere, cuboid, pyramid</li> </ul> </li> <li>describe their properties, including numbers of sides and corners, e.g.               <ul style="list-style-type: none"> <li>make and talk about shapes referring to features and properties using language such as edge, face, corner</li> <li>sort 2-D and 3-D shapes according to a single criterion e.g. shapes that are pentagons or shapes with a right angle</li> <li>visualise frequently used 2-D and 3-D shapes</li> <li>begin to understand the difference between shapes with two dimensions and those with three</li> <li>recognise the properties that are the same even when a shape is enlarged e.g. when comparing squares, circles, similar triangles, cubes or spheres of different sizes</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>describe the position of objects, e.g.               <ul style="list-style-type: none"> <li>use ordinal numbers (first, second, third...) to describe the position of objects in a row or when giving directions</li> </ul> </li> <li>recognise and explain that a shape stays the same even when it is held up in different orientations</li> <li>distinguish between straight and turning movements               <ul style="list-style-type: none"> <li>distinguish between left and right and between clockwise and anticlockwise and use these when giving directions</li> <li>instruct a programmable robot, combining straight-line movements and turns, to move along a defined path or reach a target destination</li> </ul> </li> <li>recognise right angles in turns</li> </ul>	<ul style="list-style-type: none"> <li>understand angle as a measurement of turn               <ul style="list-style-type: none"> <li>make whole turns, half-turns and quarter-turns</li> </ul> </li> <li>begin to use everyday non-standard and standard units to measure length and mass               <ul style="list-style-type: none"> <li>begin to understand that numbers can be used not only to count discrete objects but also to describe continuous measures e.g. length</li> <li>know which measuring tools to use to find, for example, how much an object weighs, how tall a child is, how long it takes to run around the edge of the playground, how much water it takes to fill the water tray</li> <li>read scales to the nearest labelled division</li> <li>begin to make sensible estimates in relation to familiar units</li> </ul> </li> <li>begin to use a wider range of measures               <ul style="list-style-type: none"> <li>make and use a 'right angle checker'</li> <li>use a time line to order daily events and ordinal numbers (first, second, third...) to describe the order of some regular events</li> </ul> </li> </ul>			
	Ma 4-Handling data and Using and applying mathematics					
Processing and representing data			Interpreting data			
L2	<ul style="list-style-type: none"> <li>sort objects and classify them using more than one criterion e.g.               <ul style="list-style-type: none"> <li>sort a given set of shapes using two criteria such as triangle / not triangle and blue / not blue</li> </ul> </li> <li>understand vocabulary relating to handling data e.g.               <ul style="list-style-type: none"> <li>understand vocabulary such as sort, group, set, list, table, most common, most popular</li> </ul> </li> <li>collect and sort data to test a simple hypothesis, e.g.               <ul style="list-style-type: none"> <li>count a show of hands to test the hypothesis 'most children in our class are in bed by 7.30pm'</li> </ul> </li> <li>record results in simple lists, tables, pictograms and block graphs, e.g.               <ul style="list-style-type: none"> <li>present information in lists, tables and simple graphs where one symbol or block represents one unit</li> <li>enter data into a simple computer database</li> </ul> </li> </ul>			<ul style="list-style-type: none"> <li>communicate their findings, using the simple lists, tables, pictograms and block graphs they have recorded, e.g.               <ul style="list-style-type: none"> <li>respond to questions about the data they have presented, e.g. how many of our names have 5 letters?</li> <li>pose similar questions about their data for others to answer</li> </ul> </li> </ul>		

Ma 1 Using and applying mathematics					
Problem solving		Communicating		Reasoning	
L3	<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>use classroom discussions to break into a problem, recognising similarities to previous work</li> <li>put the problem into their own words</li> <li>use mathematical content from levels 2 and 3</li> <li>choose their own equipment appropriate to the task, including calculators</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>check their work and make appropriate corrections, for example decide that two numbers less than 100 cannot give a total more than 200 and correct the addition</li> <li>begin to look for patterns in results as they work and use them to find other possible outcomes</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>begin to organise their work and check results, e.g.               <ul style="list-style-type: none"> <li>begin to develop own ways of recording</li> <li>develop an organised approach as they get into recording their work on a problem</li> </ul> </li> <li>discuss their mathematical work and begin to explain their thinking, e.g.               <ul style="list-style-type: none"> <li>use appropriate mathematical vocabulary</li> <li>talk about their findings by referring to their written work</li> </ul> </li> <li>use and interpret mathematical symbols and diagrams</li> </ul>	<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>make a generalisation with the assistance of probing questions and prompts</li> </ul> </li> <li>review their work and reasoning, e.g.               <ul style="list-style-type: none"> <li>respond to "What if?" questions</li> <li>when they have solved a problem, pose a similar problem for a partner</li> </ul> </li> </ul>		
	Ma2 Number			Calculating	
Counting and understanding numbers		Knowing and using number facts			
Numbers and the number system		Fractions		Mental methods	
L3	<ul style="list-style-type: none"> <li>understand place value in numbers to 1000 e.g.               <ul style="list-style-type: none"> <li>represent / compare numbers using number lines, 100-squares, base 10 materials etc</li> <li>recognise that some numbers can be represented as different arrays</li> <li>use understanding of place value to multiply/divide whole numbers by 10 (whole number answers)</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.                   <ul style="list-style-type: none"> <li>recognise sequences of multiples of 2, 5 and 10</li> </ul> </li> </ul> </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.               <ul style="list-style-type: none"> <li>understand and use unit fractions such as <math>\frac{1}{2}</math>, <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{1}{6}</math> and find those fractions of shapes and sets of objects</li> <li>recognise and record fractions that are several parts of the whole such as <math>\frac{3}{4}</math>, <math>\frac{2}{5}</math></li> <li>recognise some fractions that are equivalent to <math>\frac{1}{2}</math></li> <li>begin to use decimal notation in contexts such as money, e.g.                   <ul style="list-style-type: none"> <li>order decimals with one dp, or two dp in context of money</li> <li>know that £3.06 equals 306p</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>derive associated division facts from known multiplication facts, e.g.               <ul style="list-style-type: none"> <li>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></li> <li>use inverses to find missing whole numbers in problems such as, 'I think of number, double it and add 5. The answer is 35. What was my number?'</li> <li>begin to understand the role of '=' , the 'equals' sign e.g.                   <ul style="list-style-type: none"> <li>solve 'balancing' problems such as <math>7 \times 10 = 82 - \square</math></li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>add and subtract 2-digit numbers mentally e.g.               <ul style="list-style-type: none"> <li>calculate <math>36 + 19</math>, <math>63 - 26</math>, and complements to 100 such as <math>100 - 24</math></li> <li>use mental recall of the 2, 3, 4, 5 and 10 multiplication tables, e.g.                   <ul style="list-style-type: none"> <li>multiply a 2-digit number by 2, 3, 4 or 5</li> <li>understand finding a quarter of a number of objects as halving the number and halving again.</li> <li>begin to know multiplication facts for 6, 8, 9 and <math>7 \times</math> tables</li> </ul> </li> </ul> </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.               <ul style="list-style-type: none"> <li>choose to calculate mentally, on paper or with apparatus</li> <li>solve one-step whole number problems appropriately</li> <li>solve two-step problems that involve addition and subtraction</li> <li>solve whole number problems including those involving multiplication or division that may give rise to remainders, e.g.                   <ul style="list-style-type: none"> <li>identify appropriate operations to use</li> <li>round up or down after simple division, depending on context</li> </ul> </li> </ul> </li> </ul>
	Ma 3 Shape, Space and Measures-Understanding shapes			Measuring	
Properties of shape		Properties of position and movement		Measures	
L3	<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 <u>and</u> 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 <math>90^\circ</math> 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> <li>begin to recognise nets of familiar 3-D shapes e.g. cube, cuboid, triangular prism, square-based pyramid</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>recognise shapes in different orientations               <ul style="list-style-type: none"> <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 <math>45^\circ</math> to the mirror line, touching the line or not</li> <li>begin to reflect simple shapes in a mirror line presented at <math>45^\circ</math></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/<math>90^\circ</math> to give directions along a route</li> </ul> </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 <math>\frac{1}{2}</math> cm</li> <li>read simple scales, e.g. increments of 2, 5 or 10</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> <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 <math>\text{cm}^2</math> or <math>\text{m}^2</math></li> <li>recognise angles as a measure of turn and know that one whole turn is 360 degrees</li> </ul> </li> </ul> </li> </ul> </li> </ul>		
	Ma 4-Handling data and Using and applying mathematics			Interpreting data	
Processing and representing data			Interpreting data		
L3	<ul style="list-style-type: none"> <li>gather information, e.g.               <ul style="list-style-type: none"> <li>decide what data to collect to answer a question e.g. what is the most common way to travel to school</li> <li>make appropriate choices for recording data, e.g. a tally chart or frequency table</li> <li>construct bar charts and pictograms, where the symbol represents a group of units, e.g.                   <ul style="list-style-type: none"> <li>decide how best to represent data, for example whether a bar chart, Venn diagram or pictogram would show the information most clearly</li> <li>decide upon an appropriate scale for a graph, for example labelled divisions of 2, or, for a pictogram, one symbol to represent 2 or 5</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>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</li> </ul> </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>use a key to interpret represented data</li> <li>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</li> <li>compare data e.g. say how many more... than... and recognise the category that has most/least.</li> <li>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?'</li> <li>in the context of data relating to everyday situations, understand the idea of 'certain' and 'impossible' relating to probability</li> </ul> </li> </ul>			

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Problem solving		Communicating		Reasoning		
L4	<ul style="list-style-type: none"> <li>developing own strategies for solving problems, e.g.               <ul style="list-style-type: none"> <li>make their own suggestions of ways to tackle a range of problems</li> <li>make connections to previous work</li> <li>pose and answer questions related to a problem</li> <li>check answers and ensure solutions make sense in the context of the problem</li> <li>review their work and approaches</li> </ul> </li> <li>use their own strategies within mathematics and in applying mathematics to practical context               <ul style="list-style-type: none"> <li>use mathematical content from levels 3 and 4 to solve problems and investigate</li> </ul> </li> </ul>		<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>organise written work, for example record results in order.</li> <li>begin to work in an organised way from the start</li> <li>consider appropriate units</li> <li>use related vocabulary accurately</li> </ul> </li> </ul>		<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>check their methods and justify answers</li> <li>identify patterns as they work and form their own generalisations / rules in words</li> </ul> </li> </ul>	
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Counting and understanding numbers		Knowing and using number facts				
Numbers and the number system		Fractions		Operations, relationships between them		
L4	<ul style="list-style-type: none"> <li>recognise and describe number patterns, e.g.               <ul style="list-style-type: none"> <li>continue sequences involving decimals</li> </ul> </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               <ul style="list-style-type: none"> <li>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></li> <li>convert mixed numbers to improper fractions and vice versa</li> </ul> </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.               <ul style="list-style-type: none"> <li>use a calculator and inverse operations to find missing numbers, including decimals</li> <li>'undo' two-step problems</li> <li>understand 'balancing sums' including those using division, such as <math>20 + \square = 100 \div 4</math>.</li> </ul> </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>	
			Mental methods		Solving numerical problems	
		<ul style="list-style-type: none"> <li>use a range of mental methods of computation with the four operations, e.g.               <ul style="list-style-type: none"> <li>calculate complements to 1000.</li> </ul> </li> <li>recall multiplication facts up to 10 and quickly derive corresponding division facts, e.g.               <ul style="list-style-type: none"> <li>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>.</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>solve problems with or without a calculator               <ul style="list-style-type: none"> <li>solve two-step problems choosing appropriate operations</li> <li>deal with two constraints simultaneously</li> <li>interpret a calculator display of 4.5 as £4.50 in context of money</li> <li>carry out simple calculations involving negative numbers in context</li> </ul> </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>		
Ma 3 Shape, Space and Measures-Understanding shapes						
Properties of shape			Properties of position and movement		Measuring	
L4	<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 2 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 <math>45^\circ</math> 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 2mm</li> <li>measure and draw acute and obtuse angles to the nearest <math>5^\circ</math>, 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>	
						Measures
					<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>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</li> </ul> </li> <li>interpret frequency diagrams and simple line graphs.               <ul style="list-style-type: none"> <li>interpret simple pie charts</li> <li>interpret the scale on bar graphs and line graphs, reading between the labelled divisions e.g. reading 17 on a scale labelled in fives</li> <li>interpret the total amount of data represented</li> <li>compare data sets and respond to questions e.g. how does our data about favourite televisions programmes compare to the data from year 3 children?</li> <li>in the context of data relating to everyday situations, understand the language of probability such as 'more likely, equally likely, fair, unfair, certain'</li> </ul> </li> </ul>	
Ma 4-Handling data and Using and applying mathematics						
L4	<ul style="list-style-type: none"> <li>collect discrete data, e.g.               <ul style="list-style-type: none"> <li>given a problem, suggest possible answers and data to collect</li> <li>test a hypothesis about the frequency of an event by collecting data, for example collect dice scores to test ideas about how many scores of 6 will occur during 50 throws of a dice</li> </ul> </li> <li>group data, where appropriate, in equal class intervals, e.g.               <ul style="list-style-type: none"> <li>decide on a suitable class interval when collecting or representing data about pupils' hours per week spent watching television</li> </ul> </li> <li>record discrete data using a frequency table</li> </ul>		<ul style="list-style-type: none"> <li>represent collected data in frequency diagrams, e.g.               <ul style="list-style-type: none"> <li>suggest an appropriate frequency diagram to represent particular data, for example decide whether a bar chart, Venn diagram or pictogram would be most appropriately and for pictograms use one symbol to represent, e.g. 2, 5, 10 or 100</li> </ul> </li> <li>construct simple line graphs               <ul style="list-style-type: none"> <li>decide upon an appropriate scale for a graph e.g. labelled divisions representing 2, 5, 10, 100</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>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'</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>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</li> </ul> </li> <li>interpret frequency diagrams and simple line graphs.               <ul style="list-style-type: none"> <li>interpret simple pie charts</li> <li>interpret the scale on bar graphs and line graphs, reading between the labelled divisions e.g. reading 17 on a scale labelled in fives</li> <li>interpret the total amount of data represented</li> <li>compare data sets and respond to questions e.g. how does our data about favourite televisions programmes compare to the data from year 3 children?</li> <li>in the context of data relating to everyday situations, understand the language of probability such as 'more likely, equally likely, fair, unfair, certain'</li> </ul> </li> </ul>	

		Ma 1 Using and applying mathematics					
		Problem solving		Communicating		Reasoning	
L5	<ul style="list-style-type: none"> <li>identify and obtain necessary information to carry through a task and solve mathematical problems, e.g.</li> <li>recognise information that is important to solving the problem, determine what is missing and develop lines of enquiry</li> <li>break a several-step problem or investigation into simpler steps</li> <li>consider efficient methods, relating problems to previous experiences</li> <li>check results, considering whether these are reasonable, e.g.</li> <li>check as they work, spotting and correcting errors and reviewing methods</li> <li>solve word problems and investigations from a range of contexts e.g.</li> <li>use mathematical content from levels 4 and 5 to solve problems and investigate</li> </ul>	<ul style="list-style-type: none"> <li>show understanding of situations by describing them mathematically using symbols, words and diagrams, e.g.</li> <li>organise their work from the outset, looking for ways to record systematically</li> <li>decide how best to represent conclusions, using appropriate recording</li> <li>begin to understand and use formulae and symbols to represent problems</li> </ul>	<ul style="list-style-type: none"> <li>draw simple conclusions of their own and give an explanation of their reasoning e.g.</li> <li>explain and justify their methods and solution</li> <li>identify more complex patterns, making generalisations in words and begin to express generalisations using symbolic notation</li> <li>use examples and counter examples to justify conclusions</li> </ul>				
		Ma2 Number		Calculating			
		Counting and understanding numbers		Knowing and using number facts			
		Numbers and the number system	Fractions	Operations, relationships between them	Mental methods	Solving numerical problems	Written methods
L5	<ul style="list-style-type: none"> <li>use understanding of place value to multiply and divide whole numbers and decimals by 10, 100 and 1000 and explain the effect</li> <li>round decimals to the nearest decimal place</li> <li>order negative numbers in context</li> <li>recognise and use number patterns and relationships e.g.</li> <li>find two-digit prime numbers</li> <li>make generalisations about sequences saying whether much larger numbers will be in the sequence or not</li> </ul>	<ul style="list-style-type: none"> <li>use equivalence between fractions, e.g.</li> <li>convert fractions such as <math>\frac{2}{5}</math> into tenths or hundredths and express them as decimals or percentages and vice versa</li> <li>reduce a fraction to its simplest form by cancelling common factors</li> <li>order fractions and decimals e.g.</li> <li>order fractions with different denominators</li> <li>order decimals that have a mixture of 1, 2 or 3 decimal places</li> <li>understand simple ratio</li> </ul>	<ul style="list-style-type: none"> <li>use known facts, place value and knowledge of operations to calculate e.g.</li> <li>calculate decimal complements to 10 or 100, such as <math>100 - 63.8</math></li> <li>multiply a two-digit number by a single digit e.g. <math>39 \times 7</math></li> <li>calculate simple fractions or percentages of a number/quantity e.g. <math>\frac{3}{4}</math> of 400g or 60% of £300</li> <li>apply inverse operations</li> <li>use brackets appropriately, e.g.</li> <li>know and use the order of operations, including brackets</li> </ul>	<ul style="list-style-type: none"> <li>add and subtract negative numbers in context</li> <li>estimate using approximations</li> <li>use all four operations with decimals to two places, e.g.</li> <li>add and subtract numbers which do not have the same number of decimal places</li> <li>multiply or divide decimal numbers by a single digit e.g. <math>31.62 \times 7</math></li> <li>use a calculator where appropriate to calculate fractions/percentages of quantities/measurements e.g.</li> <li>find fractions of quantities such as <math>\frac{3}{5}</math> of 980</li> <li>find percentages such as 15% of 360g</li> <li>understand and use an appropriate non-calculator method for solving problems that involve multiplying and dividing any three-digit number by any two-digit number</li> </ul>	<ul style="list-style-type: none"> <li>solve simple problems involving ordering, adding, subtracting negative numbers in context</li> <li>solve simple problems involving ratio and direct proportion, e.g.</li> <li>begin to use multiplication rather than trial and improvement to solve ratio problems</li> <li>approximate to check answers to problems are of the correct magnitude</li> <li>check solutions by applying inverse operations or estimating using approximations</li> </ul>	<ul style="list-style-type: none"> <li>construct, express in symbolic form, and use simple formulae involving one or two operations, e.g.</li> <li>understand simple expressions using symbols e.g. '2 less than <math>n</math>' can be written as '<math>n - 2</math>'</li> <li>evaluate expressions by substituting numbers into them</li> <li>use symbols to represent an unknown number or a variable</li> <li>use and interpret coordinates in all four quadrants</li> </ul>	
		Ma 3 Shape, Space and Measures-Understanding shapes				Measuring	
		Properties of shape		Properties of position and movement		Measures	
L5	<ul style="list-style-type: none"> <li>use a wider range of properties of 2-D and 3-D shapes, e.g.</li> <li>understand 'parallel' and begin to understand 'perpendicular' in relation to edges or faces</li> <li>classify quadrilaterals, including trapezium and kite, using their properties e.g. number of parallel sides</li> <li>reason about special triangles and quadrilaterals e.g. given the perimeter and one side of an isosceles triangle, find both possible triangles</li> <li>draw a parallelogram or trapezium of a given area on a square grid</li> <li>given the coordinates of three vertices of a parallelogram, find the fourth</li> <li>know and use the angle sum of a triangle and that of angles at a point, e.g.</li> <li>calculate 'missing angles' in triangles, including isosceles triangles or right angled triangles, when only one/one other angle is given</li> <li>calculate angles on a straight line or at a point such as the angle between the hands of a clock, or intersecting diagonals at the centre of a regular hexagon</li> </ul>	<ul style="list-style-type: none"> <li>identify all the symmetries of 2-D shapes (for rotation symmetry see key stage 3 programme of study)</li> <li>find lines of reflection symmetry in shapes and diagrams</li> <li>recognise order of rotation symmetry</li> <li>transform shapes</li> <li>reflect shapes in oblique (<math>45^\circ</math>) mirror lines where the shape either does not touch the mirror line, or where the shape crosses the mirror line</li> <li>reflect shapes not presented on grids, by measuring perpendicular distances to/from the mirror</li> <li>reflect shapes in two mirror lines, where the shape is not parallel or perpendicular to either mirror</li> <li>rotate shapes, through <math>90^\circ</math> or <math>180^\circ</math>, when the centre of rotation is a vertex of the shape and recognise such rotations</li> <li>translate shapes along an oblique line</li> <li>reason about shapes, positions and movements</li> <li>visualise a 3-D shape from its net and match vertices that will be joined</li> <li>visualise where patterns drawn on a 3-D shape will occur on its net e.g. when shown a cube with patterns drawn on two or three faces, create the net to make the cube</li> <li>draw shapes with a fixed number of lines of symmetry</li> </ul>	<ul style="list-style-type: none"> <li>measure and draw angles to the nearest degree, when constructing models and drawing or using shapes, e.g.</li> <li>measure and draw reflex angles to the nearest degree, when neither edge is horizontal / vertical</li> <li>construct a triangle given the length of two sides and the angle between them (accurate to 1mm and <math>2^\circ</math>)</li> <li>use language associated with angle</li> <li>read and interpret scales on a range of measuring instruments, explaining what each labelled division represents</li> <li>solve problems involving the conversion of units e.g.</li> <li>solve problems such as <math>1.5\text{kg} \div 30\text{g}</math></li> <li>work out approximately how many km are equivalent to 20 miles</li> <li>make sensible estimates of a range of measures in relation to everyday situations</li> <li>understand and use the formula for the area of a rectangle and distinguish area from perimeter</li> <li>find the length of a rectangle given its perimeter and width</li> <li>find the area or perimeter of simple L shapes, given some edge lengths</li> </ul>				
		Ma 4-Handling data and Using and applying mathematics					
		Specifying the problem and planning, collecting data		Processing and representing data		Interpreting data	
L5	<ul style="list-style-type: none"> <li>ask questions, plan how to answer them and collect the data required</li> <li>in probability, select methods based on equally likely outcomes and experimental evidence, as appropriate</li> <li>decide if a probability can be calculated or if it can only be estimated from the results of an experiment</li> <li>understand that different outcomes may result from repeating an experiment</li> </ul>	<ul style="list-style-type: none"> <li>understand and use the mean of discrete data e.g.</li> <li>use the mean of a set of measurements from a science experiment</li> <li>understand and use the probability scale from 0 to 1 (from the key stage 3 programme of study)</li> <li>use methods based on equally likely outcomes and experimental evidence, as appropriate, to find and justify probabilities, and approximations to these (from the key stage 3 programme of study) e.g.</li> <li>compare two spinners e.g. to find which is more likely to result in an even number</li> <li>create and interpret line graphs where the intermediate values have meaning e.g.</li> <li>draw and use a conversion graph for pounds and Euros</li> </ul>	<ul style="list-style-type: none"> <li>compare two simple distributions, using the range and one of mode, median or mean (mean and median are drawn from the key stage 3 programme of study)</li> <li>describe and compare two sets of football results, by using the range and mode</li> <li>solve problems such as, 'Find 5 numbers where the mode is 6 and the range is 8'</li> <li>interpret graphs and diagrams, including pie charts, and draw conclusions</li> <li>complete a 2-way table, given some of the data</li> <li>interpret bar graphs with grouped data</li> <li>interpret and compare pie charts where it is not necessary to measure angles</li> <li>read between labelled divisions on a scale, for example read 34 on a scale labelled in tens or 3.7 on a scale labelled in ones, and find differences to answer, 'How much more...?'</li> <li>recognise the difference between discrete and continuous data</li> <li>recognise when information is presented in a misleading way, for example compare two pie charts where the sample sizes are different</li> <li>when drawing conclusions, identify further questions to ask</li> <li>describe and predict outcomes from data using the language of chance or likelihood</li> </ul>				