

Core learning in mathematics: links to the National Curriculum 2000

Underlined text in red indicates new objectives that add detail to the relevant National Curriculum Programme of Study.

Year 1

Using and applying mathematics

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, e.g. to 'pay' and 'give change' 	<ul style="list-style-type: none"> Approach problems involving number, and data presented in a variety of forms, in order to identify what they need to do Develop flexible approaches to problem solving and look for ways to overcome difficulties 	<p>N1a N1b</p>
<ul style="list-style-type: none"> Describe a problem using numbers, practical materials and diagrams; use these to solve the problem and set the solution back in the original context 	<ul style="list-style-type: none"> Make decisions about which operations and problem-solving strategies to use Organise and check their work 	<p>N1c N1d</p>
<ul style="list-style-type: none"> Answer a question by selecting and using suitable equipment, and sorting information, shapes or objects; display results using tables and pictures 	<ul style="list-style-type: none"> Approach problems involving number, and data presented in a variety of forms, in order to identify what they need to do Solve a relevant problem by using simple lists, tables and charts to sort, classify and organise information Select and use appropriate mathematical equipment when solving problems involving measures or measurement Select and use appropriate equipment and materials when solving shape and space problems 	<p>N1a S1b S1c</p>
<ul style="list-style-type: none"> Describe simple patterns and relationships involving numbers or shapes; decide whether examples satisfy given conditions 	<ul style="list-style-type: none"> Create and describe number patterns Recognise simple spatial patterns and relationships and make predictions about them Understand a general statement and investigate whether particular cases match it Present results in an organised way 	<p>N2b S1e N1h N1g</p>
<ul style="list-style-type: none"> Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures 	<ul style="list-style-type: none"> Communicate in spoken and pictorial form using informal language and recording Explain their methods and reasoning when solving problems involving number and data 	<p>N1f N1i</p>

Counting and understanding number

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> Count reliably at least 20 objects, recognising that when rearranged the number of objects stays the same; <u>estimate a number of objects that can be checked by counting</u> 	<ul style="list-style-type: none"> Count reliably up to 20 objects and recognise that if the objects are rearranged the number stays the same; be familiar with the numbers 11 to 20; gradually extend counting to 100 	<p>N2a N2b</p>
<ul style="list-style-type: none"> Compare and order numbers, using the related vocabulary; use the equals (=) sign 	<ul style="list-style-type: none"> Understand and use the vocabulary of comparing ordering numbers Use the symbol '=' to represent equality 	<p>N2c N3a</p>
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Read and write numbers to 20 at first; order a set of one and two-digit numbers and position them on a number line 	<p>N2c</p>
<ul style="list-style-type: none"> <u>Say the number that is one more or less than any given number and ten more or less for multiples of ten</u> 		
<ul style="list-style-type: none"> <u>Use the vocabulary of halves and quarters in context</u> 		

Knowing and using number facts

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Explore and record patterns related to addition and subtraction, explaining the patterns and using them to make predictions Develop rapid recall of number facts: know addition and subtraction facts to 10 	<p>N2b N3c</p>
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Explore and record patterns of multiples of 2, 5 and 10 explaining the patterns and using them to make predictions 	<p>N2b</p>
<ul style="list-style-type: none"> Recall the doubles of all numbers to at least 10 		

Calculating

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> • 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 • 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 • Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences 	<ul style="list-style-type: none"> • Understand addition and use related vocabulary; recognise that addition can be done in any order • Develop a range of mental methods, including adding 10 to any single-digit number, then adding and subtracting a multiple of 10 to or from a two-digit number, making use of the fact that addition can be done in any order • Understand subtraction as both 'take away' and 'difference' and use the related vocabulary • Use the symbol '=' to represent equality 	<p>N3a N3d N3a</p>
<ul style="list-style-type: none"> • Solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups 		

Understanding shape

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> • Visualise and name common 2-D shapes and 3-D solids and describe their features; use them to make patterns, pictures and models 	<ul style="list-style-type: none"> • Observe, handle, name and describe mathematical features of common 2-D and 3-D shapes, including triangles of various kinds, rectangles including squares, circles, cubes, cuboids • Describe properties of shapes that they can see or visualise using the related vocabulary • Create 2-D shapes and 3-D shapes 	<p>S2b S2a S2c</p>
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Understand angle as a measure of turn using whole turns, half-turns and quarter-turns 	<p>S4b</p>
<ul style="list-style-type: none"> • Visualise and use everyday language to describe the position of objects and direction and distance when moving them, e.g. when placing or moving objects on a games board 	<ul style="list-style-type: none"> • Observe, visualise and describe positions, directions and movements using common words 	<p>S3a</p>

Measuring

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> Estimate, measure, weigh and compare objects, choosing and using suitable uniform non-standard or standard units and measuring instruments, e.g. a lever balance, metre stick or measuring jug 	<ul style="list-style-type: none"> Estimate, measure and weigh objects; choose and use simple measuring instruments Estimate the size of objects and order them by direct comparison using appropriate language; compare and measure objects using uniform non-standard units [e.g. a straw, wooden cubes] 	S4c S4a
<ul style="list-style-type: none"> Use vocabulary related to time; order days of the week and months; read the time to the hour and half hour 	<ul style="list-style-type: none"> Put familiar events in chronological order 	S4a

Handling data

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> Answer a question by recording information in lists and tables; present outcomes using practical resources, pictures, block graphs or pictograms 	<ul style="list-style-type: none"> Solve a relevant problem by using simple lists, tables and charts to sort, classify and organise information 	N5a
<ul style="list-style-type: none"> Use diagrams to sort objects into groups according to a given criterion; suggest a different criterion for grouping the same objects 	<ul style="list-style-type: none"> Use simple lists, tables and charts to sort, classify and organise information 	N5a N5b

Year 2

Using and applying mathematics

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> Solve problems involving addition, subtraction, multiplication or division in contexts of numbers, measures or pounds and pence 	<ul style="list-style-type: none"> Solve whole-number problems (including problems involving money or measures) Develop flexible approaches to problem solving and look for ways to overcome difficulties 	<p>N4a N1b</p>
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Choose sensible calculation methods to solve whole-number problems, drawing on their understanding of the operations Make decisions about which operations and problem-solving strategies to use Organise and check their work Check that their answers are reasonable 	<p>N4a N1c N1d N4b</p>
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Approach problems involving number, and data presented in a variety of forms, in order to identify what they need to do Solve a relevant problem by using simple lists, tables and charts to sort, classify and organise information Select and use appropriate mathematical equipment when solving problems involving measures or measurement Select and use appropriate equipment and materials when solving shape and space problems 	<p>N1a N5a S1b S1c</p>
<ul style="list-style-type: none"> Describe patterns and relationships involving numbers or shapes, make predictions and test these with examples 	<ul style="list-style-type: none"> Try different approaches and find ways of overcoming difficulties when solving shape and space problems Create and describe number patterns Recognise simple spatial patterns and relationships and make predictions about them Understand a general statement and investigate whether particular cases match it 	<p>S1a S2b S1e N1h</p>

Framework review

<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Present results in an organised way Use the correct language, symbols and vocabulary associated with number and data Use the correct language and vocabulary for shape, space and measures Communicate in spoken, pictorial and written form, using mathematical language and symbols Explain their methods and reasoning when solving problems Use mathematical communication and explanation skills 	<p>N1g N1e S1d N1f N1i N4b S1f</p>
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Counting and understanding number

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> Read and write two- and three-digit numbers in figures and words; describe and extend number sequences and recognise odd and even numbers 	<ul style="list-style-type: none"> Read and write numbers to 100 or beyond Recognise sequences, including odd and even numbers to 30 then beyond 	<p>N2c N2b</p>
<ul style="list-style-type: none"> 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; <u>partition two-digit numbers in different ways, including into multiples of ten and one</u> 	<ul style="list-style-type: none"> Gradually extend counting to 100 and beyond Recognise that the position of a digit gives its value and know what each digit represents, including zero as a place-holder 	<p>N2a N2c</p>
<ul style="list-style-type: none"> Order two-digit numbers and position them on a number line; <u>use the greater than (>), less than (<) signs</u> 	<ul style="list-style-type: none"> Order a set of one and two-digit numbers and position them on a number line and hundred-square 	<p>N2c</p>
<ul style="list-style-type: none"> <u>Estimate a number of objects</u> and round two-digit numbers to the nearest 10 	<ul style="list-style-type: none"> Round any two-digit number to the nearest 10 	<p>N2c</p>
<ul style="list-style-type: none"> Find one half, one quarter and <u>three quarters</u> of shapes and sets of objects 	<ul style="list-style-type: none"> Find one half and one quarter of shapes and small numbers of objects 	<p>N3b</p>

Knowing and using number facts

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Explore and record patterns related to addition and subtraction, explaining the patterns and using them to make predictions Develop rapid recall of number facts: use addition and subtraction facts to 10 to derive facts with totals to 20 	<p>N2b</p>

Framework review

<ul style="list-style-type: none"> Understand that halving is the inverse of doubling and derive and recall doubles of all numbers <u>to 20</u>, and the corresponding halves 	<ul style="list-style-type: none"> Know doubles of numbers to 10 and halves of even numbers to 20 Recognise the relationship between halving and doubling Understand that halving is the inverse of doubling 	N3c N2b N3b
<ul style="list-style-type: none"> Derive and recall multiplication facts for the 2, <u>5</u> and 10 times-tables and the related division facts; recognise multiples of 2, 5 and 10 	<ul style="list-style-type: none"> Know multiplication facts for the $\times 2$ and $\times 10$ multiplication tables and derive corresponding division facts Explore patterns of multiples of 2, 5 and 10 explaining the patterns and using them to make predictions 	N3c N2b
<ul style="list-style-type: none"> Use knowledge of number facts and operations to check answers to calculations 	<ul style="list-style-type: none"> Check that their answers are reasonable 	N4b

Calculating

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> Add or subtract mentally a single-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 	<ul style="list-style-type: none"> Develop a range of mental methods for finding, from known facts, those that they cannot recall, including adding and subtracting a multiple of 10 to or from a two-digit number; develop a variety of methods for adding and subtracting, including making use of the facts that addition can be done in any order and that subtraction is the inverse of addition 	N3d
<ul style="list-style-type: none"> Understand that subtraction is the inverse of addition and vice versa and use this to derive and record related addition and subtraction number sentences 	<ul style="list-style-type: none"> Recognise that subtraction is the inverse of addition; give the subtraction corresponding to an addition and vice versa Carry out simple calculations of the form $40 + 30 = ?$, $40 + ? = 100$, $56 - ? = 10$; record calculations in a number sentence, using the symbols $+$, $-$, \times, \div and $=$ correctly 	N3a N3e
<ul style="list-style-type: none"> Represent repeated addition and <u>arrays</u> as multiplication, and <u>sharing</u> and repeated subtraction (grouping) as division; use practical and informal written methods and related vocabulary to support multiplication and division, <u>including calculations with remainders</u> 	<ul style="list-style-type: none"> Understand multiplication as repeated addition; begin to understand division as grouping (repeated subtraction); use vocabulary associated with multiplication and division 	N3b
<ul style="list-style-type: none"> Use the symbols $+$, $-$, \times, \div and $=$ to record and interpret number sentences involving all four operations; calculate the value of an unknown in a number sentence, e.g. $30 - \square = 24$, $\square \div 2 = 6$ 	<ul style="list-style-type: none"> Use symbols Solve simple missing number problems [e.g. $6 = 2 + ?$] 	N1e N3a

Understanding shape

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> Visualise common 2-D shapes and 3-D solids and identify them from pictures of them in different positions and orientations; sort, make and describe shapes, referring to their properties 	<ul style="list-style-type: none"> Name and describe the mathematical features of common 2-D and 3-D shapes, including hexagons, pentagons, cylinders, pyramids, cones and spheres Describe properties of shapes that they can see or visualise using the related vocabulary Create 2-D shapes and 3-D shapes 	S2b S2a S2c
<ul style="list-style-type: none"> Identify reflection symmetry in patterns and 2-D shapes and draw lines of symmetry in shapes 	<ul style="list-style-type: none"> Recognise reflective symmetry in familiar 2-D shapes and patterns 	S2d
<ul style="list-style-type: none"> Follow and give instructions involving position, direction and movement 	<ul style="list-style-type: none"> Recognise movements in a straight line (translations) and rotations, and combine them in simple ways 	S3b
<ul style="list-style-type: none"> Recognise and use whole, half and quarter turns, both clockwise and anti-clockwise; know that a right angle represents a quarter turn 	<ul style="list-style-type: none"> Understand angle as a measure of turn using whole turns, half-turns and quarter-turns Recognise right angles 	S4b S3b S3c

Measuring

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> Estimate, compare and measure lengths, masses and capacities, choosing and using standard units (m, cm, kg, litre) and suitable measuring instruments 	<ul style="list-style-type: none"> Estimate, measure and weigh objects; choose and use simple measuring instruments Compare and measure objects using a standard unit of length (cm, m), weight (kg), capacity (l) [e.g. 'longer or shorter than a metre rule', 'three-and-a-bit litre jugs'] 	S4c S4a
<ul style="list-style-type: none"> Read the numbered divisions on a scale, and interpret the divisions between them, e.g. on a scale from 0 to 25 with intervals of 1 shown but only the divisions 0, 5, 10, 15 and 20 numbered; use a ruler to draw and measure lines to the nearest centimetre 	<ul style="list-style-type: none"> Read and interpret numbers and scales to the nearest labelled division. 	S4c
<ul style="list-style-type: none"> Use units of time (seconds, minutes, hours, days) and know the relationships between them; read the time to the quarter hour; identify time intervals, including those that cross the hour 	<ul style="list-style-type: none"> Compare the durations of events using a standard unit of time 	S4a

Handling data

2006 objectives	National Curriculum 2000 KS1 programme of study	
<ul style="list-style-type: none"> • Answer a question by recording data in lists and tables; represent the data as block graphs or pictograms to show results; use ICT to organise and present data 	<ul style="list-style-type: none"> • Solve a relevant problem by using simple lists, tables and charts to sort, classify and organise information 	N5a
<ul style="list-style-type: none"> • Use lists, tables and diagrams to sort objects against one or two criteria; explain choices using appropriate language, including <i>not</i> 	<ul style="list-style-type: none"> • Use simple lists, tables and charts to sort, classify and organise information • Discuss what they have done and explain their results 	N5a N5b

Year 3

Using and applying mathematics

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Solve one- and two-step problems involving numbers, money or measures, including time, choosing and carrying out appropriate calculations 	<ul style="list-style-type: none"> Choose, use and combine any of the four number operations to solve word problems involving numbers in 'real life', money or measures of length, mass, capacity or time, then perimeter and area Choose suitable number operations to solve a given problem, and recognise similar problems to which they apply Choose and use an appropriate way to calculate 	<p>N4a N3a N4b</p>
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Use notation diagrams and symbols correctly within a given problem Check results and ensure that solutions are reasonable in the context of the problem 	<p>N1g D1e/N4c /S1d</p>
<ul style="list-style-type: none"> Follow a line of enquiry by deciding what information is important; make and use lists, tables and graphs to organise and interpret the information 	<ul style="list-style-type: none"> Select and use handling data skills when solving problems Identify the information needed to carry out the tasks/solve a problem Decide how best to organise and present findings Present and interpret solutions 	<p>D1a N1b/D1c D1f S1g</p>
<ul style="list-style-type: none"> Identify patterns and relationships involving numbers or shapes, and use these to solve problems 	<ul style="list-style-type: none"> Recognise, represent and interpret simple number relationships Search for pattern in their results; develop logical thinking Recognise and describe number patterns, using these to make predictions 	<p>N4d N1k N2b</p>
<ul style="list-style-type: none"> Describe and explain methods, choices and solutions to puzzles and problems, orally and in writing, using pictures and diagrams 	<ul style="list-style-type: none"> Communicate mathematically, including the use of precise mathematical language Use notation diagrams and symbols correctly within a given problem Explain and justify their methods and reasoning 	<p>N1i/D1g N1g/S1f N4b/D1h</p>

Counting and understanding number

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Read, write and order whole numbers, recognising that the position of a digit gives its value Locate on a number line, and order, a set of numbers 	<p>N2c N2i</p>
<ul style="list-style-type: none"> <u>Partition three-digit numbers into multiples of one hundred, ten and one in different ways</u> 		
<ul style="list-style-type: none"> Round two- or three-digit numbers to the nearest 10 or 100 and give estimates for their sums and differences 	<ul style="list-style-type: none"> Round integers to the nearest 10 or 100 Estimate answers by approximating 	<p>N2c N4c</p>
<ul style="list-style-type: none"> Read and write proper fractions, e.g. $\frac{3}{7}$, $\frac{9}{10}$, 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 	<ul style="list-style-type: none"> Understand unit fractions [e.g. one-third or one-eighth], then fractions that are several parts of one whole [e.g. two-thirds or five-eighths], locate them on a number line; find fractions of shapes Understand simple equivalent fractions 	<p>N2d N2e</p>

Knowing and using number facts

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Derive and recall all addition and subtraction facts for each number to 20, <u>sums and differences of multiples of 10</u> and number pairs that total 100 	<ul style="list-style-type: none"> Recall all addition and subtraction facts for each number to 20 Work out what they need to add to any two-digit number to make 100 	<p>N3d N3e</p>
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Recall multiplication facts to 10×10 and use them to derive quickly the corresponding division facts Recognise two- and three-digit multiples of 2, 5 or 10 	<p>N3f N2b</p>
<ul style="list-style-type: none"> Use knowledge of number operations and corresponding inverses, including doubling and halving, to estimate and check calculations 	<ul style="list-style-type: none"> Develop further their understanding of the four number operations and the relationships between them including inverses; use the related vocabulary Make mental estimates of the answers to calculations; check results Estimate answers by approximating and checking that their results are reasonable by thinking about the context of the problem, and where necessary checking accuracy [e.g. by using the inverse operation, by repeating the calculation in a different order] 	<p>N3a N1e N4c</p>

Calculating

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> <u>Add or subtract mentally combinations of one-digit and two-digit numbers</u> 		
<ul style="list-style-type: none"> Develop and use written methods to record, support or explain addition and subtraction of two- and three-digit numbers 	<ul style="list-style-type: none"> Use written methods to add and subtract positive integers less than 1000 	N3i
<ul style="list-style-type: none"> Multiply one- and two-digit numbers by 10 or 100, and describe the effect 	<ul style="list-style-type: none"> Multiply any integer by 10 or 100 	N2c
<ul style="list-style-type: none"> Use practical and informal written methods to support multiplication and division of two-digit numbers (e.g. 13×3, $30 \div 4$); round remainders up or down, depending on the context 	<ul style="list-style-type: none"> Use written methods for multiplication and division by a single-digit integer of two-digit integer Find remainders after division; round up or down after division, depending on the context 	N3j N3b
<ul style="list-style-type: none"> Understand that division reverses multiplication and vice versa and use to derive and record related multiplication and division number sentences 	<ul style="list-style-type: none"> Develop further their understanding of the four number operations and the relationships between them, including inverses 	N3a
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Use [unit fractions] to find fractions of quantities 	N2d

Understanding shape

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Relate 2-D shapes and 3-D solids to drawings of them; describe, visualise, classify, draw and make the shapes 	<ul style="list-style-type: none"> Visualise 3-D shapes from 2-D drawings Describe 2-D and 3-D shapes Make and draw 2-D and 3-D shapes; recognise their geometrical features and properties including faces and symmetry, and use these to classify shapes 	S2d S2b S2c
<ul style="list-style-type: none"> Draw and complete shapes with reflective symmetry and draw the reflection of a shape in a mirror line along one side 	<ul style="list-style-type: none"> Transform objects in practical situations; visualise and predict the position of a shape following a reflection 	S3b
<ul style="list-style-type: none"> Read and record the vocabulary of <u>position, direction</u> and movement, using the four compass directions to describe movement about a grid 	<ul style="list-style-type: none"> Visualise and describe movements using appropriate language 	S3a
<ul style="list-style-type: none"> Use a set-square to draw right angles and to identify right angles in 2-D shapes; compare angles with a right angle; <u>recognise that a straight line is equivalent to two right angles</u> 	<ul style="list-style-type: none"> Recognise angles as greater or less than a right angle or half-turn; measure and draw right angles Recognise right angles 	S4c S2a

Measuring

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Recognise the need for standard units of length, mass and capacity, choose which ones are suitable for a task, and use them to make sensible estimates in everyday situation • Select and use appropriate measuring instruments for a task 	S1a/S4a S4b
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Interpret numbers and read scales with increasing accuracy 	S4b
<ul style="list-style-type: none"> • Read the time on a 12-hour digital clock and to the nearest five minutes on an analogue clock; calculate time intervals and find start or end times for a given time interval 	<ul style="list-style-type: none"> • Read the time from analogue and digital 12-hour clocks; use units of time (minutes and hours) and know the relationship between them • Solve word problems involving time 	S4d N4a

Handling data

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> • 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 • Use Venn diagrams or Carroll diagrams to sort data and objects using more than one criterion 	<ul style="list-style-type: none"> • Solve problems involving data • Interpret tables, lists and charts used in everyday life; construct and interpret frequency tables • Represent and interpret discrete data using graphs and diagrams, including pictograms and bar charts, using ICT where appropriate • Draw conclusions from graphs. 	D2a D2b D2c D2f

Year 4

Using and applying mathematics

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Solve one- and two-step problems involving numbers, money or measures, including time; choose and carry out appropriate calculations, using calculator methods where appropriate 	<ul style="list-style-type: none"> Choose, use and combine any of the four number operations to solve word problems involving numbers in 'real life', money or measures of length, mass, capacity or time, then perimeter and area Choose suitable number operations to solve a given problem, and recognise similar problems to which they apply Choose and use an appropriate way to calculate 	<p>N4a N3a N4b</p>
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Use notation diagrams and symbols correctly within a given problem Present and interpret solutions in the context of the problem 	<p>N1g N1h</p>
<ul style="list-style-type: none"> Suggest a line of enquiry and the strategy needed to follow it; collect, organise and interpret selected information to find answers 	<ul style="list-style-type: none"> Select and use handling data skills when solving problem Identify the information needed to carry out the tasks/solve a problem Organise work and record or represent it in a variety of ways Decide how best to organise and present findings 	<p>D1a N1b/D1c S1e D1f</p>
<ul style="list-style-type: none"> Identify and use patterns, relationships and properties of numbers or shapes; investigate a statement involving numbers and test it with examples 	<ul style="list-style-type: none"> Recognise, represent and interpret simple number relationships Understand and investigate general statements Search for pattern in their results; develop logical thinking Recognise and describe number patterns, using these to make predictions; make general statements, using words, and test these 	<p>N4d N1j N1k N2b</p>
<ul style="list-style-type: none"> Report solutions to puzzles and problems, giving explanations and reasoning orally and in writing, using diagrams and symbols 	<ul style="list-style-type: none"> Organise work and record or represent it in a variety of ways when presenting solutions to problems Explain and justify their methods and reasoning 	<p>S1e N4b/D1h</p>

Counting and understanding number

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Recognise and continue number sequences formed by counting on or back in steps of constant size 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. $-3 > -5$, $-1 < +1$ 	<ul style="list-style-type: none"> Recognise and continue number sequences formed by counting on or back in steps of constant size, extending to negative integers when counting back Use correctly the symbols $<$, $>$, $=$; order a set of negative integers 	N2a N2c
<ul style="list-style-type: none"> Use decimal notation for tenths and hundredths and partition decimals; relate the notation to money and measurement; position one- and two-place decimals on a number line 	<ul style="list-style-type: none"> Understand and use decimal notation for tenths and hundredths in context [e.g. order amounts of money, round a sum of money to the nearest £, convert a length such as 1.36 metres to centimetres and vice versa]; locate on a number line, and order, a set of numbers or measurements 	N2i
<ul style="list-style-type: none"> Recognise the equivalence between decimal and fraction forms of one half, quarters, tenths and hundredths 	<ul style="list-style-type: none"> Recognise the equivalence between the decimal and fraction forms of one half, quarters, tenths and hundredths 	N2f
<ul style="list-style-type: none"> Use diagrams to identify equivalent fractions, e.g. $\frac{6}{8}$ and $\frac{3}{4}$, or $\frac{70}{100}$ and $\frac{7}{10}$; interpret mixed numbers and position them on a number line, e.g. $3\frac{1}{2}$ 	<ul style="list-style-type: none"> Recognise approximate proportions of a whole and use simple fractions to describe them Understand unit fractions [e.g. one-third or one-eighth] then fractions that are several parts of one whole [e.g. two-thirds or five-eighths], locate them on a number line Understand simple equivalent fractions 	N2g N2d N2e
<ul style="list-style-type: none"> <u>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'</u> 		

Knowing and using number facts

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> <u>Use knowledge of addition and subtraction facts and place value to derive sums and differences of pairs of multiples of 10, 100 or 1000</u> 		
<ul style="list-style-type: none"> Identify the doubles of two-digit numbers; <u>use to calculate doubles of multiples of 10 and 100 and derive the corresponding halves</u> 	<ul style="list-style-type: none"> Double and halve [mentally] any two-digit number 	N3g

Framework review

<ul style="list-style-type: none"> Derive and recall multiplication facts up to 10×10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple 	<ul style="list-style-type: none"> Recall multiplication facts to 10×10 and use them to derive quickly the corresponding division facts 	N3f N2b
<ul style="list-style-type: none"> Use knowledge of rounding, number operations and inverses to estimate and check calculations 	<ul style="list-style-type: none"> Develop further their understanding of the four number operations and the relationships between them including inverses Estimate answers by approximating and checking that their results are reasonable by thinking about the context of the problem, and where necessary checking accuracy [e.g. by using the inverse operation, by repeating the calculation in a different order] Use approximations and other strategies to check that their answers are reasonable Make mental estimates of the answers to calculations; check results 	N3a N1e N4c N3i, N3j
<ul style="list-style-type: none"> Identify pairs of fractions that total 1 		

Calculating

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Add or subtract mentally pairs of two-digit whole numbers, e.g. $47 + 58$, $91 - 35$ 	<ul style="list-style-type: none"> Add or subtract [mentally] any pair of two-digit whole numbers 	N3e
<ul style="list-style-type: none"> Refine and use efficient written methods to add and subtract two- and three-digit whole numbers and £.p 	<ul style="list-style-type: none"> Use written methods to add and subtract positive integers less than 1000 	N3i
<ul style="list-style-type: none"> Multiply and divide numbers to 1000 by 10 and then 100 (whole number answers), understanding the effect; relate to scaling up or down 	<ul style="list-style-type: none"> Multiply and divide any integer by 10 or 100 	N2c
<ul style="list-style-type: none"> 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. 15×9, $98 \div 6$ 	<ul style="list-style-type: none"> Use written methods for short multiplication and division by a single-digit integer of two-digit then three-digit then four-digit integers, then of numbers with decimals; then use long multiplication, at first for two-digit by two-digit integer calculations, then for three-digit by two-digit calculations; extend division to informal methods of dividing by a two-digit divisor [e.g. $64 \div 16$] Find remainders after division 	N3j N3b
<ul style="list-style-type: none"> Find fractions of numbers, quantities or shapes, e.g. $\frac{1}{5}$ of 30 plums, $\frac{3}{8}$ of a 6 by 4 rectangle 	<ul style="list-style-type: none"> Find unit fractions and fractions that are several parts of a whole of shapes and quantities 	N2d

Framework review

<ul style="list-style-type: none"> Use a calculator to carry out one- 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 	<ul style="list-style-type: none"> Use a calculator to solve number problems [e.g. $4 \square \times 7 = 343$]; know how to enter and interpret money calculations 	N3k
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Understanding shape

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Draw polygons and classify them by identifying their properties, including their line symmetry 	<ul style="list-style-type: none"> Draw 2-D shapes; recognise reflective symmetry in regular polygons 	S2c
<ul style="list-style-type: none"> Visualise 3-D objects from 2-D drawings and make nets of common solids 	<ul style="list-style-type: none"> Make and draw with increasing accuracy 2-D and 3-D shapes and patterns Visualise 3-D shapes from 2-D drawings. 	S2c S2d
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Visualise and describe movements using appropriate language Identify and draw 2-D shapes in different orientations on grids 	S3a S3c
<ul style="list-style-type: none"> Know that angles are measured in degrees and that one whole turn is 360°; draw, compare and order angles less than 180° 	<ul style="list-style-type: none"> Recognise angles as greater or less than a right angle or half-turn, estimate their size and order them Know that angles are measured in degrees and that one whole turn is 360 	S4c S2a

Measuring

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Choose and use standard metric units and their abbreviations when estimating, measuring and recording length, mass 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 	<ul style="list-style-type: none"> Recognise the need for standard units of length, mass and capacity, choose which ones are suitable for a task, and use them to make sensible estimates in everyday situations Record measurements using decimal notation 	S1a/S4a S4b
<ul style="list-style-type: none"> Interpret intervals and divisions on partially numbered scales and record readings accurately, where appropriate to the nearest tenth of a unit 	<ul style="list-style-type: none"> Interpret numbers and read scales with increasing accuracy; record measurements using decimal notation 	S4b
<ul style="list-style-type: none"> Draw rectangles and measure and calculate their perimeters, find the area of rectilinear shapes drawn on a square grid by counting squares 	<ul style="list-style-type: none"> Find perimeters of simple shapes; find areas of rectangles using the formula, understanding its connection to counting squares. 	S4e

Framework review

<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Read the time from analogue and digital 12-hour clocks; use seconds, minutes, hours and know the relationship between them 	S4d
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Handling data

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> • Determine the data needed to answer a specific question; organise, present, analyse and interpret the data in tables, diagrams, tally charts, pictograms and bar charts, using ICT where appropriate 	<ul style="list-style-type: none"> • Solve problems involving data • Interpret tables, lists and charts used in everyday life; construct and interpret frequency tables • Represent and interpret data using graphs and diagrams, including pictograms, bar charts and line graphs, using ICT where appropriate 	D2a D2b D2e
<ul style="list-style-type: none"> • Compare the impact of representations where scales have intervals of differing step size 	<ul style="list-style-type: none"> • Draw conclusions from graphs and recognise when information is presented in a misleading way 	D2f

Year 5

Using and applying mathematics

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Solve one- and two-step problems involving whole numbers and decimals and all four operations, choosing and using appropriate calculation strategies, including calculator use 	<ul style="list-style-type: none"> Choose, use and combine any of the four number operations to solve word problems involving numbers in 'real life', money or measures of length, mass, capacity or time, then perimeter and area Break down a more complex problem or calculation into simpler steps before attempting a solution Choose suitable number operations to solve a given problem, and recognise similar problems to which they apply Choose and use an appropriate way to calculate 	<p>N4a N1b N3a N4b</p>
<ul style="list-style-type: none"> <u>Represent a problem by identifying and recording the calculations needed to solve it</u>; find possible solutions and confirm them in the context of the problem 	<ul style="list-style-type: none"> Use notation diagrams and symbols correctly within a given problem Present and interpret solutions in the context of the problem Check results and ensure that solutions are reasonable in the context of the problem 	<p>N1g N1h D1e/N4c /S1d</p>
<ul style="list-style-type: none"> Plan and pursue an enquiry; present evidence by collecting, organising and interpreting information; <u>suggest extensions to the enquiry</u> 	<ul style="list-style-type: none"> Select and use handling data skills when solving problems Identify the information needed to carry out the tasks/solve a problem Decide how best to organise and present findings Present and interpret solutions 	<p>D1a N1b/D1c D1f S1g</p>
<ul style="list-style-type: none"> Explore patterns, properties and relationships and propose a general statement involving numbers or shapes; identify examples for which the statement is true or false 	<ul style="list-style-type: none"> Recognise, represent and interpret simple number relationships Understand and investigate general statements Search for pattern in their results; develop logical thinking Recognise and describe number patterns, using these to make predictions; make general statements and test these Approach spatial problems flexibly 	<p>N4d N1j N1k N2a S1c</p>

Framework review

<ul style="list-style-type: none"> Explain reasoning using diagrams, graphs and text; refine ways of recording using images and symbols 	<ul style="list-style-type: none"> Use mathematical reasoning to explain features of shape and space Organise work and refine ways of recording Use notation diagrams and symbols correctly within a given problem Explain and justify their methods and reasoning 	S1h N1g N1f N4b/D1h
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Counting and understanding number

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Count from any given number in whole number and decimal steps, extending beyond zero when counting backwards; relate the numbers to their position on a number line 	<ul style="list-style-type: none"> Recognise and continue number sequences formed by counting on or back in steps of constant size from any integer, extending to negative integers when counting back Order a set of negative integers Locate on a number line, and order, a set of numbers or measurements 	N2a N2c N2i
<ul style="list-style-type: none"> Explain what each digit represents in whole numbers and decimals with up to two places, and partition, round and order these numbers 	<ul style="list-style-type: none"> Order whole numbers, recognising that the position of a digit gives its value Understand and use decimal notation for tenths and hundredths 	N2c N2i
<ul style="list-style-type: none"> Express a smaller whole number as a fraction of a larger one; find equivalent fractions, e.g. $\frac{7}{10} = \frac{14}{20}$, or $\frac{19}{10} = 1\frac{9}{10}$; relate fractions to their decimal representations 	<ul style="list-style-type: none"> Understand equivalent fractions Recognise the equivalence between the decimal and fraction forms of one half, quarters, tenths and hundredths 	N2e N2f
<ul style="list-style-type: none"> Understand percentage as the number of parts in every 100 and express tenths and hundredths as percentages 	<ul style="list-style-type: none"> Understand that 'percentage' means the 'number of parts per 100' 	
<ul style="list-style-type: none"> Use sequences to scale numbers up or down; solve problems involving proportions of quantities, e.g. decrease quantities in a recipe designed to feed six people 	<ul style="list-style-type: none"> Solve simple problems involving direct proportion 	N2h

Knowing and using number facts

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Use knowledge of place value and addition and subtraction of two-digit numbers to derive sums and differences, doubles and halves of decimals, e.g. 6.5 ± 2.7, halve 5.6, double 0.34 	<ul style="list-style-type: none"> Double and halve any two-digit number 	N3g
<ul style="list-style-type: none"> Recall quickly multiplication facts up to 10×10, use to multiply pairs of multiples of 10 and 100 and derive quickly corresponding division facts 	<ul style="list-style-type: none"> Recall multiplication facts to 10×10 and use them to derive quickly the corresponding division facts 	N3f

Framework review

<ul style="list-style-type: none"> Identify pairs of factors of two-digit whole numbers and find common multiples, e.g. for 6 and 9 	<ul style="list-style-type: none"> Find factor pairs of any two-digit integer 	N2b
<ul style="list-style-type: none"> Use knowledge of rounding, place value, number facts and inverse operations to estimate and check calculations 	<ul style="list-style-type: none"> Estimate answers by approximating and checking that their results are reasonable by thinking about the context of the problem, and where necessary checking accuracy [e.g. by using the inverse operation, by repeating the calculation in a different order] Use approximations and other strategies to check that their answers are reasonable Make mental estimates of the answers to calculations; check results 	N1e N4c N3i, N3j

Calculating

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Extend mental methods for whole-number calculations, e.g. to multiply a two-digit by one-digit number (e.g. 12×9), to multiply by 25 (e.g. 16×25), to subtract one near multiple of 1000 from another (e.g. $6070 - 4097$) 	<ul style="list-style-type: none"> Handle [mentally] particular cases of three-digit and four-digit additions and subtractions by using compensation or other methods [e.g. $3000 - 1997$, $4560 + 998$] Multiply and divide [mentally], at first in the range 1 to 100 [e.g. 27×3, $65 \div 5$], then for particular cases of larger numbers by using factors, distribution or other methods 	N3e N3h
<ul style="list-style-type: none"> Use efficient written methods to add and subtract whole numbers and decimals with up to two places 	<ul style="list-style-type: none"> Use written methods to add and subtract positive integers up to 10000, then add and subtract numbers involving decimals 	N3i
<ul style="list-style-type: none"> Use understanding of place value to multiply and divide whole numbers and decimals by 10, 100 or 1000 	<ul style="list-style-type: none"> Multiply and divide any integer by 10 or 100 then extend to multiplying and dividing by 1000; multiply and divide decimals by 10 or 100 	N2c
<ul style="list-style-type: none"> Refine and use efficient written methods to multiply and divide $HTU \times U$, $TU \times TU$, $U.t \times U$, and $HTU \div U$ 	<ul style="list-style-type: none"> Use written methods for short multiplication and division by a single-digit integer of three-digit integers, then of numbers with decimals; then use long multiplication, at first for two-digit by two-digit integer calculations 	N3j
<ul style="list-style-type: none"> Find fractions using division, e.g. $\frac{1}{100}$ of 5kg, and percentages of numbers and quantities, e.g. 10%, 5% and 15% of £80 	<ul style="list-style-type: none"> Find fractions of quantities Find percentages of whole number quantities 	N2d N2f
<ul style="list-style-type: none"> Use a calculator to solve problems, including those involving decimals or fractions, e.g. to find $\frac{3}{4}$ of 150g; interpret the display correctly in the context of measurement 	<ul style="list-style-type: none"> Use a calculator for calculations involving several digits, including decimals; use a calculator to solve number problems [e.g. $4 \square \times 7 = 343$]; know how to enter and interpret money calculations and fractions 	N3k

Understanding shape

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Identify, visualise and describe properties of rectangles, triangles, regular polygons and 3-D solids; use knowledge of properties to draw 2-D shapes and identify and draw nets of 3-D shapes 	<ul style="list-style-type: none"> Visualise and describe 2-D and 3-D shapes and the way they behave, especially that of triangles, quadrilaterals, and prisms and pyramids of various kinds Make and draw with increasing accuracy 2-D and 3-D shapes and patterns; recognise reflective symmetry in regular polygons; recognise their geometrical features and properties and use these to classify shapes and solve problems Visualise 3-D shapes from 2-D drawings. 	<p>S2b S2c S2d</p>
<ul style="list-style-type: none"> Read and plot co-ordinates in the first quadrant; recognise parallel and perpendicular lines in grids and shapes; use a set-square and ruler to draw shapes with perpendicular or parallel sides 	<ul style="list-style-type: none"> Read and plot coordinates in the first quadrant Locate and draw shapes using coordinates in the first quadrant Recognise perpendicular and parallel lines 	<p>N4e S3c S2a</p>
<ul style="list-style-type: none"> Complete patterns with up to two lines of symmetry and draw the position of a shape after a reflection or translation 	<ul style="list-style-type: none"> Transform objects in practical situations; transform images using ICT; visualise and predict the position of a shape following a rotation, reflection or translation Identify and draw 2-D shapes in different orientations on grids; locate and draw shapes using coordinates in the first quadrant, then in all four quadrants 	<p>S3b S3c</p>
<ul style="list-style-type: none"> Estimate, draw and measure acute and obtuse angles using an angle measurer or protractor to a suitable degree of accuracy; calculate angles in a straight line 	<ul style="list-style-type: none"> Measure and draw acute and obtuse and right angles to the nearest degree Recognise that angles at a point on a straight line total 180 degrees 	<p>S4c S2a</p>

Measuring

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Read, choose, use and record standard metric units to estimate and measure length, weight and capacity to a suitable degree of accuracy, e.g. the nearest centimetre; convert larger to smaller units using decimals to one place, e.g. change 2.6 kg to 2600 g 	<ul style="list-style-type: none"> Recognise the need for standard units of length, mass and capacity, choose which ones are suitable for a task, and use them to make sensible estimates in everyday situations; convert one metric unit to another [e.g. convert 3.17kg to 3170g] Convert between centimetres and millimetres or metres, then between millimetres and metres, and metres and kilometres 	<p>S1a/S4a N2i</p>

Framework review

<ul style="list-style-type: none"> Interpret a reading that lies between two unnumbered divisions on a scale 	<ul style="list-style-type: none"> Recognise that measurement is approximate; interpret numbers and read scales with increasing accuracy 	S4b
<ul style="list-style-type: none"> <u>Draw and measure lines to the nearest millimetre</u>; measure and calculate the perimeter of regular and irregular polygons; use the formula for the area of a rectangle to calculate its area 	<ul style="list-style-type: none"> Find perimeters of simple shapes; find areas of rectangles using the formula. 	S4e
<ul style="list-style-type: none"> Read timetables and time using 24-hour clock notation; use a calendar to calculate time intervals 	<ul style="list-style-type: none"> Read the time from 24-hour clocks; use days and weeks, and know the relationship between them 	S4d

Handling data

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Describe the occurrence of familiar events using the language of chance or likelihood 	<ul style="list-style-type: none"> Develop an understanding of probability through classroom situations; discuss events using a vocabulary that includes the words 'equally likely', 'fair', 'unfair', 'certain'. 	D2f
<ul style="list-style-type: none"> Answer a set of related questions by collecting, selecting and organising relevant data; draw conclusions, using ICT to present features, and identify further questions to ask Construct frequency tables, pictograms and bar and line graphs to represent the frequencies of events and changes over time 	<ul style="list-style-type: none"> Solve problems involving data Interpret tables, lists and charts used in everyday life; construct and interpret frequency tables Represent and interpret discrete data using graphs and diagrams, including pictograms, bar charts and line graphs, using ICT where appropriate Draw conclusions from statistics and graphs Select and use appropriate mathematical equipment, including ICT 	D2a D2b D2c D2f N1c
<ul style="list-style-type: none"> Find and interpret the mode of a set of data 	<ul style="list-style-type: none"> Know that mode is a measure of average and use the idea to describe data sets 	D2d

Year 6

Using and applying mathematics

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Solve multi-step problems, and problems involving fractions, decimals and percentages; choose and use appropriate calculation strategies at each stage, including calculator use 	<ul style="list-style-type: none"> Choose, use and combine any of the four number operations to solve word problems involving numbers in 'real life', money or measures of length, mass, capacity or time, then perimeter and area Break down a more complex problem or calculation into simpler steps before attempting a solution Choose suitable number operations to solve a given problem, and recognise similar problems to which they apply Choose and use an appropriate way to calculate Select and use appropriate mathematical equipment, including ICT 	<p>N4a N1b N3a N4b N1c</p>
<ul style="list-style-type: none"> Tabulate systematically the information in a problem or puzzle; identify and record the steps or calculations needed to solve it, using symbols where appropriate; interpret solutions in the original context and check their accuracy 	<ul style="list-style-type: none"> Use notation diagrams and symbols correctly within a given problem Present and interpret solutions in the context of the problem Check results and ensure that solutions are reasonable in the context of the problem 	<p>N1g N1h D1e/N4c /S1d</p>
<ul style="list-style-type: none"> Suggest, plan and develop lines of enquiry; collect, organise and represent information, interpret results and <u>review methods; identify and answer related questions</u> 	<ul style="list-style-type: none"> Select and use handling data skills when solving problems in other areas of the curriculum, in particular science Identify the information needed to carry out the tasks/solve a problem Decide how best to organise and present findings Present and interpret solutions in the context of the problem 	<p>D1a N1b/D1c N1c D1f</p>

Framework review

<ul style="list-style-type: none"> • Represent and interpret sequences, patterns and relationships involving numbers and shapes; suggest and test hypotheses; construct and use simple expressions and formulae in words then symbols, e.g. the cost of c pens at 15 pence each is 15c pence 	<ul style="list-style-type: none"> • Recognise, represent and interpret simple number relationships • Understand and investigate general statements • Search for pattern in their results; develop logical thinking • Recognise and describe number patterns, using these to make predictions; make general statements, using words to describe a functional relationship, and test these • Approach spatial problems flexibly 	<p>N4d N1j N1k N2a S1c</p>
<ul style="list-style-type: none"> • Explain reasoning and conclusions, using words, symbols or diagrams as appropriate 	<ul style="list-style-type: none"> • Use mathematical reasoning to explain features of shape and space • Organise work and record or represent it in a variety of ways when presenting solutions to geometrical problems • Use notation diagrams and symbols correctly within a given problem • Construct and use formulae in words • Explain and justify their methods and reasoning 	<p>N4d S1h S1e N1g/S1f N4d N4b/D1h</p>

Counting and understanding number

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> • <u>Find the difference between a positive and a negative integer, or two negative integers, in context</u> 		
<ul style="list-style-type: none"> • Use decimal notation for tenths, hundredths and <u>thousandths, partition, round and order decimals with up to three places, and position them on the number line</u> 	<ul style="list-style-type: none"> • Understand and use decimal notation for tenths and hundredths, then recognise thousandths (only in metric measurements) 	
<ul style="list-style-type: none"> • Round numbers, including those with up to <u>three decimal places</u> 	<ul style="list-style-type: none"> • Round integers to the nearest 10 or 100 and then 1000 • Round a number with one or two decimal places to the nearest integer or tenth 	
<ul style="list-style-type: none"> • <u>Express a larger whole number as a fraction of a smaller one e. g. recognise that 8 slices of a 5-slice pizza represents $\frac{8}{5}$ or $1\frac{3}{5}$ pizzas;</u> simplify fractions by cancelling common factors; order a set of fractions by converting them to fractions with a common denominator 	<ul style="list-style-type: none"> • Simplify fractions by cancelling common factors; compare and order simple fractions by converting them to fractions with a common denominator 	<p>N2e N2f</p>
<ul style="list-style-type: none"> • <u>Express one quantity as a percentage of another</u>, e.g. express £400 as a percentage of £1000; <u>find equivalent percentages</u>, decimals and fractions 	<ul style="list-style-type: none"> • Recognise the equivalence between the decimal and fraction forms of one half, quarters, tenths and hundredths 	<p>N2f</p>

Framework review

<ul style="list-style-type: none"> Solve simple problems involving direct proportion by scaling quantities up or down 	<ul style="list-style-type: none"> Recognise approximate proportions of a whole and use simple fractions and percentages to describe them Solve simple problems involving ratio and direct proportion 	N2g N2h
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Knowing and using number facts

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> <u>Use knowledge of place value and multiplication facts to 10×10 to derive related multiplication and division facts involving decimal numbers, e.g. 0.8×7, $4.8 \div 6$</u> 		
<ul style="list-style-type: none"> Use knowledge of multiplication facts to derive quickly squares of numbers to <u>12×12 and the corresponding squares of multiples of 10</u> 	<ul style="list-style-type: none"> Recognise square numbers up to 10×10 	N2b
<ul style="list-style-type: none"> Recognise that prime numbers have only two factors and identify prime numbers less than 100; find the prime factors of two-digit whole numbers 	<ul style="list-style-type: none"> Recognise prime numbers to 20; find factor pairs and all the prime factors of any two-digit integer 	N2b
<ul style="list-style-type: none"> Use approximations and apply tests of divisibility to check results 	<ul style="list-style-type: none"> Estimate answers by approximating and checking that their results are reasonable by thinking about the context of the problem, and where necessary checking accuracy [e.g. by using the inverse operation, by repeating the calculation in a different order] Use approximations and other strategies to check that their answers are reasonable Make mental estimates of the answers to calculations; check results 	N1e N4c N3i, N3j

Calculating

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Calculate mentally with whole numbers and decimals, e.g. $U.t \pm U.t$, $TU \times U$, <u>$U.t \times U$</u>, $TU \div U$, <u>$U.t \div U$</u> 	<ul style="list-style-type: none"> Add or subtract [mentally] any pair of two-digit numbers; handle particular cases of three-digit and four-digit additions and subtractions by using compensation or other methods [e.g. $3000 - 1997$, $4560 + 998$] Multiply and divide [mentally] in the range 1 to 100 [e.g. 27×3, $65 \div 5$], then for particular cases of larger numbers by using factors, distribution or other methods 	N3e N3h

Framework review

<ul style="list-style-type: none"> Use efficient written methods to add and subtract integers and decimals, to multiply and divide integers and decimals by a one-digit integer, and to multiply two- and three-digit integers by a two-digit integer 	<ul style="list-style-type: none"> Use written methods to add and subtract integers, then numbers involving decimals Use written methods for short multiplication and division by a single-digit integer of four-digit integers, then of numbers with decimals; use long multiplication for three-digit by two-digit calculations; extend division to dividing by a two-digit divisor 	N3i N3j
<ul style="list-style-type: none"> Relate fractions to multiplication and division, e.g. $6 \div 2 = \frac{1}{2}$ of $6 = 6 \times \frac{1}{2}$; express a quotient as a fraction or decimal, e.g. $67 \div 5 = 13.4$ or $13\frac{2}{5}$; find fractions and percentages of whole-number quantities, e.g. $\frac{5}{8}$ of 96, 65% of £260 	<ul style="list-style-type: none"> Find fractions of quantities Find percentages of whole number quantities, using a calculator where appropriate Express a quotient as a fraction or decimal (e.g. $67 \div 5 = 13.4$ or $13\frac{2}{5}$) 	N2d N2f N3b
<ul style="list-style-type: none"> Use a calculator to solve problems involving multi-step calculations; <u>carry out calculations involving time by converting hours and minutes to minutes</u> 	<ul style="list-style-type: none"> Use a calculator for calculations involving several digits, including decimals; use a calculator to solve number problems [e.g. $4\Box \times 7 = 343$]; know how to enter and interpret money calculations and fractions; know how to select the correct key sequence for calculations with more than one operation [e.g. $56 \times (87 - 48)$] 	N3k

Understanding shape

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Describe, identify and visualise parallel and perpendicular edges or faces and use these properties to classify 2-D shapes and 3-D solids 	<ul style="list-style-type: none"> Recognise perpendicular and parallel lines Visualise and describe 2-D and 3-D shapes and the way they behave, especially triangles, quadrilaterals, and prisms and pyramids of various kinds; recognise when shapes are identical 	S2a S2b
<ul style="list-style-type: none"> Make and draw shapes with increasing accuracy and apply knowledge of their properties 	<ul style="list-style-type: none"> Make and draw with increasing accuracy 2-D and 3-D shapes and patterns Identify and draw 2-D shapes in different orientations on grids 	S2c S3c

Framework review

<ul style="list-style-type: none"> Visualise and draw on grids of different types where a shape will be after reflection, after translations or after rotation through 90° or 180° about its centre or one of its vertices 	<ul style="list-style-type: none"> Visualise and describe movements using appropriate language Transform objects in practical situations; transform images using ICT; visualise and predict the position of a shape following a rotation, reflection or translation Select and use appropriate mathematical equipment, including ICT Identify and draw 2-D shapes in different orientations on grids 	<p>S3a S3b S3c S1c</p>
<ul style="list-style-type: none"> Use coordinates in the first quadrant to draw and locate shapes 	<ul style="list-style-type: none"> Read and plot coordinates in the first quadrant, then in all four quadrants [e.g. plot the vertices of a rectangle, or a graph of the multiples of 3] Locate and draw shapes using coordinates in the first quadrant 	<p>N4e S3c</p>
<ul style="list-style-type: none"> Estimate angles, and use a protractor to measure and draw them, on their own and in shapes; calculate angles in a triangle or around a point 	<ul style="list-style-type: none"> Recognise angles, estimate their size; measure and draw acute, obtuse and right angles to the nearest degree Know that angles at a point total 360 degrees and that the sum of the angles of a triangle is 180 degrees 	<p>S4c S2a</p>

Measuring

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Select and use standard metric units of measure and convert between units using decimals to two places, e.g. change 2.75 litres to 2750 ml, or vice versa 	<ul style="list-style-type: none"> Recognise the need for standard units of length, mass and capacity, and use them to make sensible estimates in everyday situations; convert one metric unit to another [e.g. convert 3.17kg to 3170g] Convert between centimetres and millimetres or metres 	<p>S1a/S4a N2j</p>
<ul style="list-style-type: none"> Read and interpret scales on a range of measuring instruments, recognising that the measurement made is approximate and recording results to a required degree of accuracy; compare readings on different scales, e.g. when using different instruments 	<ul style="list-style-type: none"> Recognise that measurement is approximate; interpret numbers and read scales with increasing accuracy 	<p>S4b</p>
<ul style="list-style-type: none"> Calculate the perimeter and area of rectilinear shapes; estimate the area of an irregular shape by counting squares 	<ul style="list-style-type: none"> Find areas, understanding the connection to counting squares; calculate the perimeter and area of shapes composed of rectangles. 	<p>S4e</p>

Handling data

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Describe and predict outcomes from data using the language of chance or likelihood 	<ul style="list-style-type: none"> Explore doubt and certainty and develop an understanding of probability through classroom situations; discuss events using a vocabulary that includes the words 'equally likely', 'fair', 'unfair', 'certain'. 	D2f
<ul style="list-style-type: none"> Solve problems by collecting, selecting, processing, presenting and interpreting data, using ICT where appropriate; draw conclusions and identify further questions to ask Construct and interpret frequency tables, bar charts with grouped discrete data, and line graphs; interpret pie charts 	<ul style="list-style-type: none"> Solve problems involving data Construct and interpret frequency tables, including tables for grouped discrete data Represent and interpret discrete data using graphs and diagrams, including bar charts and line graphs, then interpret a wider range of graphs and diagrams, using ICT where appropriate Draw conclusions from statistics and graphs. 	D2a D2b D2c D2f
<ul style="list-style-type: none"> Describe and interpret results and solutions to problems using the mode, range, <u>median and mean</u> 	<ul style="list-style-type: none"> Know that mode is a measure of average and that range is a measure of spread, and to use both ideas to describe data sets 	D2d

Year 6 progression to Year 7

Using and applying mathematics

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Solve problems by breaking down complex calculations into simpler steps, choose and use operations and calculation strategies appropriate to the numbers and context; try alternative approaches to overcome difficulties; present, interpret and compare solutions 	<ul style="list-style-type: none"> Choose, use and combine any of the four number operations to solve word problems involving numbers in 'real life', money or measures of length, mass, capacity or time, then perimeter and area Break down a more complex problem or calculation into simpler steps before attempting a solution Choose suitable number operations to solve a given problem, and recognise similar problems to which they apply Choose and use an appropriate way to calculate Approach problems flexibly, including trying alternative approaches to overcome any difficulties 	<p>N4a N1b N3a N4b N1d/S1c/ D1b</p>
<ul style="list-style-type: none"> Represent information or unknown numbers in a problem, e.g. in a table, formula or equation; explain solutions in the context of the problem 	<ul style="list-style-type: none"> Make connections in mathematics and appreciate the need to use numerical skills and knowledge when solving problems in other parts of the mathematics curriculum Construct and use formulae in words then symbols Use notation diagrams and symbols correctly within a given problem Present and interpret solutions in the context of the problem 	<p>N1a N4d N1g N1h</p>
<ul style="list-style-type: none"> Develop and evaluate lines of enquiry; identify, collect, organise and analyse relevant information; decide how best to represent conclusions <u>and what further questions to ask</u> 	<ul style="list-style-type: none"> Select and use handling data skills when solving problems in other areas of the curriculum, in particular science Identify the information needed to carry out the tasks/solve a problem Decide how best to organise and present findings Present and interpret solutions 	<p>D1a N1b/D1c D1f N1h/S1g</p>

Framework review

<ul style="list-style-type: none"> • Generate sequences and describe the general term in simple cases; use letters and symbols to represent unknown numbers or variables; represent simple relationships as graphs 	<ul style="list-style-type: none"> • Recognise, represent and interpret simple number relationships [e.g. plot the graph of the multiples of 3]. • Understand and investigate general statements • Use notation diagrams and symbols correctly within a given problem • Describe number patterns, using these to make predictions; make general statements and test these • Search for pattern in their results; develop logical thinking 	<p>N4d/N4e N1j N1g/S1f N2a N1k</p>
<ul style="list-style-type: none"> • Explain and justify reasoning and conclusions, using notation, symbols and diagrams; find a counter-example to disprove a conjecture; use step-by-step deductions to solve problems 	<ul style="list-style-type: none"> • Use mathematical reasoning to explain features of shape and space • Organise work and record or represent it in a variety of ways when presenting solutions to geometrical problems • Explain and justify their methods and reasoning 	<p>S1h S1e N4b/D1h</p>

Counting and understanding number

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> • Compare and order integers and decimals in different contexts 	<ul style="list-style-type: none"> • Locate on a number line, and order, a set of numbers or measurements 	N2i
<ul style="list-style-type: none"> • Order a set of fractions by converting them to decimals 	<ul style="list-style-type: none"> • Compare and order simple fractions 	N2e N2f
<ul style="list-style-type: none"> • Recognise approximate proportions and use fractions and percentages to identify and compare proportions, e.g. when interpreting pie charts 	<ul style="list-style-type: none"> • Recognise approximate proportions of a whole and use simple fractions and percentages to describe them, • Understand that 'percentage' can be used for comparisons 	N2g N2f
<ul style="list-style-type: none"> • Understand the relationship between ratio and proportion, solve problems involving proportions; use ratio notation, reduce a ratio to its simplest form and divide a quantity into two parts in a given ratio 	<ul style="list-style-type: none"> • Solve problems involving ratio and direct proportion 	N2h

Knowing and using number facts

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> • Consolidate the rapid recall of number facts, including multiplication facts to 10×10 and the associated division facts 	<ul style="list-style-type: none"> • Recall multiplication facts to 10×10 and use them to derive quickly the corresponding division facts 	N3f
<ul style="list-style-type: none"> • Recognise the square roots of perfect squares to 12×12 		
<ul style="list-style-type: none"> • Recognise and use multiples, factors, divisors, common factors, highest common factors and lowest common multiples in simple cases 	<ul style="list-style-type: none"> • Recognise two- and three-digit multiples of 2, 5 or 10; find factor pairs and all the prime factors of any two-digit integer 	N2b

Framework review

<ul style="list-style-type: none"> • Make and <u>justify</u> estimates and approximations of calculations 	<ul style="list-style-type: none"> • Estimate answers by approximating • Make mental estimates of the answers to calculations; check results 	N1e N3i, N3j
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Calculating

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> • Understand how the commutative, associative and distributive laws, and the relationships between operations, including inverse operations, can be used to calculate more efficiently; use the order of operations, including brackets • Consolidate and extend mental methods of calculation to include decimals, fractions and percentages 	<ul style="list-style-type: none"> • Understand the use of brackets to determine the order of operations; understand why the commutative, associative and distributive laws apply to addition and multiplication and how they can be used to do mental and written calculations more efficiently 	N3c
<ul style="list-style-type: none"> • Use standard column procedures to add and subtract integers and decimals, and to multiply two- and three-digit integers by a one- or two-digit integer; extend division to dividing three-digit integers by a two-digit integer 	<ul style="list-style-type: none"> • Use written methods to add and subtract positive integers, then decimals • Use written methods for short multiplication and division by a single-digit integer of two-digit then three-digit then four-digit integers, then decimals; use long multiplication for two-digit by two-digit calculations, then for three-digit by two-digit calculations; extend division to dividing by a two-digit divisor 	N3i N3j
<ul style="list-style-type: none"> • Calculate percentage increases or decreases and fractions of quantities and measurements (integer answers) 	<ul style="list-style-type: none"> • Find percentages of whole number quantities, using a calculator where appropriate 	N2f
<ul style="list-style-type: none"> • Use bracket keys and the memory of a calculator to carry out calculations with more than one step; <u>use the square root key</u> 	<ul style="list-style-type: none"> • Use a calculator for calculations involving several digits, including decimals; use a calculator to solve number problems; know how to enter and interpret money calculations and fractions; know how to select the correct key sequence for calculations with more than one operation [e.g. $56 \times (87 - 48)$] 	N3k

Understanding shape

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> • <u>Use correctly the vocabulary, notation and labelling conventions for lines, angles and shapes</u> 	<ul style="list-style-type: none"> • Make more precise use of geometrical language 	S2b

Framework review

<ul style="list-style-type: none"> Extend knowledge of properties of triangles and quadrilaterals and use these to solve problems, explaining reasoning with diagrams 	<ul style="list-style-type: none"> Visualise and describe 2-D shapes and the way they behave, especially triangles and quadrilaterals Recognise the geometrical features and properties [of 2-D shapes], including angles, pairs of parallel lines and symmetry, and use these to classify shapes and solve problems 	S2b S2c
<ul style="list-style-type: none"> Know the sum of angles at a point, on a straight line and in a triangle, <u>and recognise vertically opposite angles</u> 	<ul style="list-style-type: none"> Know that angles at a point total 360 degrees, then recognise that angles at a point on a straight line total 180 degrees; know that the sum of the angles of a triangle is 180 degrees 	S2a
<ul style="list-style-type: none"> Use all four quadrants to find coordinates of points determined by geometric information 	<ul style="list-style-type: none"> Read and plot coordinates in all four quadrants [e.g. plot the vertices of a rectangle]. Locate and draw shapes using coordinates in all four quadrants 	N4e S3C
<ul style="list-style-type: none"> Identify all the symmetries of 2-D shapes; transform images using ICT 		
<ul style="list-style-type: none"> <u>Construct a triangle given two sides and the included angle</u> 	<ul style="list-style-type: none"> Measure and draw acute, obtuse and right angles to the nearest degree Draw with increasing accuracy 2-D shapes 	S4c S2c

Measuring

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> Convert between related metric units using decimals to three places, e.g. convert 1375 mm to 1.375 m, or vice versa 	<ul style="list-style-type: none"> Convert one metric unit to another Convert between centimetres and millimetres or metres, then between millimetres and metres, and metres and kilometres 	S1a/S4a N2j
<ul style="list-style-type: none"> Solve problems by measuring, estimating and calculating; measure and calculate using imperial units still in everyday use; know their approximate metric values 	<ul style="list-style-type: none"> Know the rough metric equivalents of imperial units still in daily use 	S4a
<ul style="list-style-type: none"> <u>Calculate the area of right-angled triangles given the lengths of the two perpendicular sides, and the volume and surface area of cubes and cuboids</u> 		

Handling data

2006 objectives	National Curriculum 2000 KS2 programme of study	
<ul style="list-style-type: none"> <u>Understand and use the probability scale from 0 to 1</u>, find and justify probabilities based on equally likely outcomes in simple contexts 	<ul style="list-style-type: none"> Discuss events using a vocabulary that includes the words 'equally likely' 	D2f

Framework review

<ul style="list-style-type: none"> • Explore hypotheses by planning surveys or experiments to collect small sets of discrete or continuous data; select, process, present and interpret the data, using ICT where appropriate; identify ways to extend the survey or experiments • Construct, interpret and compare graphs and diagrams that represent data, e.g. compare proportions in two pie charts that represent different totals 	<ul style="list-style-type: none"> • Solve problems involving data • Interpret tables, lists and charts used in everyday life; construct and interpret frequency tables, including tables for grouped discrete data • Represent and interpret discrete data using graphs and diagrams, including pictograms, bar charts and line graphs • Recognise the difference between discrete and continuous data • Select and use appropriate mathematical equipment, including ICT 	<p>D2a D2b D2c D2e D2f N1c</p>
<ul style="list-style-type: none"> • Write a short report of a statistical enquiry and illustrate with appropriate diagrams, graphs and charts, using ICT as appropriate; justify the choice of what is presented 	<ul style="list-style-type: none"> • Interpret a wider range of graphs and diagrams, using ICT where appropriate • Know that mode is a measure of average and that range is a measure of spread, and to use both ideas to describe data sets • Draw conclusions from statistics and graphs 	<p>D2c D2e D2f</p>