Aspect (NUMBER)	Key Stage 1 Essential Skills		Lower Key Stage 2 Essential Skills		Upper Key Stage 2 Essential Skills	
	End of Year 1 Expectations	End of Year 2 Expectation	End of Year 3 Expectation	End of Year 4 Expectations	End of Year 5 Expectations	End of Year 6 Expectations
Addition & Subtraction						
Adding & subtracting mentally	Represent, reason with and use number bonds and related subtraction facts within 20 (e.g. 9 + 7 = 16; 16 – 7 = 9; 7 = 16 – 9). Add and subtract one-digit and two-digit numbers to 20 (e.g. 9 + 9 = 18, 18 – 9 = 19), including zero, using abstract representation.er	Recall and use addition and subtraction facts to 20 fluently, and derive and use related addition and subtraction facts up to 100 (e.g. 3 + 7 = 10; 10 – 7 = 3; 30 + 70 = 100; 100 – 70 = 30). Add and subtract numbers to 100 using concrete objects, pictorial representations and mentally, including: – a two-digit number and ones – a two-digit number and tens – two two-digit numbers – adding three one-digit numbers.	Recall and use addition and subtraction facts to 100 (e.g. 27 + 73 = 100; 100 – 27 = 73). Derive and use related facts up to 1000, working with more complex combinations (e.g. 27 + 73 = 100; 270 + 730 = 1000). Choose their own equipment appropriate to task, trying different approaches and finding ways of overcoming difficulties. Add and subtract numbers mentally, including: – a three-digit number and ones – a three-digit number and tens – a three-digit number and hundreds.	Continue to practice mental methods for addition and subtraction with increasingly large numbers, including partitioning to aid fluency.	Add and subtract increasingly large numbers, identifying and using the best mental strategies to tackle a range of problems.	Perform more complex mental calculations, including mixed operations and large numbers.

Adding and subtracting using written methods	Read, write and interpret simple mathematical statements, involving addition (+), subtraction (-) and equals (=) signs, recognising that addition and subtraction are related operations.	Show, with examples, that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. Record addition and subtraction in columns to support their understanding of place value in preparation for formal written methods with larger numbers.	Add and subtract numbers with up to three digits, using the formal written methods of columnar addition and subtraction, carrying and exchanging when necessary.	Where appropriate, add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction, including adding decimal numbers through the context of money.	Add and subtract whole numbers with more than five digits (including decimal numbers), using formal written methods of columnar addition and subtraction.	Use their knowledge of the order of operations to carry out calculations, involving the four operations, identifying how the position of the brackets can affect the answer. Continue to add and subtract in columns with increasingly large numbers (including decimals) to improve procedural fluency.
Estimating and checking	N/A	Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems. Check their calculations by adding numbers in a different order (e.g. 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5).	Estimate, by rounding to the nearest 10, the answer to addition and subtraction calculations with numbers up to 1000 and use inverse operations to check answers. Begin to recognise estimation, rounding and approximation as strategies to check their working out.	Estimate, by rounding to the nearest 10, 100 and 1000, and use inverse operations to check answers to a calculation with increasingly large numbers.	Use rounding to estimate and check answers to calculations and determine, in the context of a problem, levels of accuracy, including rounding by 10, 100, 1000, 10,000 and 100,000. Estimate within addition and subtraction problems by rounding decimal numbers to the nearest whole number, choosing how to round depending on the context. Check answers using inverse operations.	Use estimation/rounding/approximation to check answers to calculations and determine, in the context of a problem, an appropriate level of accuracy. Estimate by rounding decimal numbers with three or more decimal places to the nearest whole number or to one or two decimal places, depending on the context of the problem. Check answers using inverse operations.

Problem solving and applying	Solve simple one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, includin g missing number problems (e.g. 4 + ? = 9, 7 = ? – 9). Use addition and subtraction in familiar and practical contexts.	Apply their increasing knowledge of mental and written methods to solve simple problems with addition and subtraction, using concrete objects and pictorial representations (including those involving numbers, quantities and measures).	Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction with numbers up to 1000.	Solve addition and subtraction two-step problems (with increasingly large numbers) in contexts, deciding which operations and methods to use, explaining their choices.	Solve addition and subtraction multi-step problems in contexts, involving all of the above, deciding which operations and methods to use and why.	Solve addition and subtraction multi-step problems in contexts, involving all of the above, deciding which operations and methods to use, explaining their choices.
Algebra						
Formulae, expressions and equations	N/A	N/A	N/A	N/A	N/A	Express missing number problems algebraically using all four operations and mixed operations (e.g. 3n + 5 = 20, what is the value of n? If n = 9, what is 9n + 2?). Use and choose simple formulae in other contexts (e.g. to find missing numbers, lengths, co-ordinates and angles). Find pairs of numbers that satisfy an equation involving two unknowns, including solving problems ad puzzles (e.g. here are three equations: – a + b + c = 30 – a + b = 24

						– b + c = 14 What are the values of a, b and c?). Enumerate possibilities of combinations of two variables, including solving problems and puzzles (e.g. what two numbers can add up to).
Sequences	N/A	N/A	N/A	N/A	N/A	Generate and describe linear sequences.
Problem solving	N/A	N/A	N/A	N/A	N/A	Solve multi-step number and practical problems that involve all of the above.
Decimals & Percentages						
Recognise, read, write and compare decimals	N/A	N/A	N/A	Recognise and write decimal equivalents of any number of tenths or hundredths, including plotting tenths and hundredths on a number line. Recall and write decimal equivalents to ½, 1/4 and 3/4. Compare and order numbers with the same number of decimal places up to two decimal places.	Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. Read and write decimal numbers, up to three decimal places, as fractions (e.g. 0.771 = 771/1000). Read, write, order and compare numbers with up to three decimal places (e.g. can you order 2.321, 2.4, 2.34, 2.401 and 2.5?).	Identify the value of each digit in numbers given to three decimal places. Multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places and, solve related problems with increasing fluency.

Rounding decimal numbers	N/A	N/A	N/A	Round any decimal with one decimal place to the nearest whole number to estimate when problem solving, including mixed digit numbers (e.g. 1345.4 – 1345 345.6 – 346 34.6 – 35).	Round any decimals with two decimal places to the nearest whole number and to one decimal place (e.g. 380.64 – 380.6 – 381 34.65 – 34.7 – 35 1456.54 – 1456.5 – 1457).	Round decimals with three decimal places to the nearest whole number and to one or two decimal places and decide independently how decimal numbers should be rounded when estimating (e.g. 34.365 – 34 34.365 – 34.4 34.365 – 34.37).
Multiplying decimal numbers	N/A	N/A	N/A	N/A	Multiply whole numbers and those involving decimals by 10, 100 and 1000, in context and apply to problem solving.	Multiply numbers with up to two decimal places by whole numbers, using formal and informal written methods.
Dividing with decimal answers	N/A	N/A	N/A	Find the effect of dividing a one or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths with increasing fluency and solve simple problems mentally.	Divide whole numbers and those involving decimals by 10, 100 and 1000, in context and apply to problem solving.	Use written division methods in cases where the answer has up to two decimal places.
Percentages	N/A	N/A	N/A	N/A	Recognise the percent symbol (%), knowing that percent relates to 'number of parts per hundred', and write percentages as a fraction with denominator hundred, and as a decimal.	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

					Recall from memory 50%, 25%, 75% and 10% as a fraction and a decimal.	
Problem solving	N/A	N/A	N/A	Solve simple measure and money problems involving fractions and decimals to two decimal places.	Solve problems involving number up to three decimal places, including converting between units of measure in context. Solve problems which require knowing percentage and decimal equivalents of ½, ¼, ¾, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.	Solve problems, involving all of the above, which require answers to be rounded to specified degrees of accuracy. Solve problems involving the calculation of percentages of whole numbers or measures, such as 15% of 360 and the use of percentages for comparison. Use advanced mental strategies (e.g. when finding 90% take away 10% from the total, or when finding 60% find a half and 10% and add them together).
Fractions, Ratio & Proportion						
Recognise, represent and name fractions	Recognise, find and name half as one of two equal parts and find half of discrete and continuous quantities by problem solving, using shapes, objects and quantities (e.g. recognise and find half of a length,	Recognise, find, name and write fractions 1/3, 1/4, 2/4 an d 3/4 of a length, shape, set of objects or quantity, meeting 2/4 and 3/4 as the first example of non-unit fractions.	Recognise and show, using diagrams, equivalent fractions with small denominators to tenths. Recognise and use fractions as numbers: unit fractions and non-unit fractions with small	Recognise and show, using diagrams, families of common equivalent fractions.Use factors and multiples to find and recognise equivalent fractions and simplify where appropriate.	Identify, name and write equivalent fractions of a given fraction, including tenths and hundredths and cancel fractions to their simplest form using factors. Recognise mixed numbers and improper fractions	Use common factors to simplify fractions. Use common multiples to express fractions in the same denomination and cancel fractions to their simplest form with increasing fluency.

	quantity, set of objects or shape). Recognise, find and name a quarter as one of four equal parts and find a quarter of discrete and continuous quantities by problem solving, using shapes, objects and quantities (e.g. recognise and find a quarter of a length, quantity, set of objects or shape).		denominators to tenths, and instantly recognise fractions equivalent to a half.	Recall and write decimal equivalents to 1/2,1/4 and 3/4 and recognise and write decimal equivalents of any number of tenths or hundredths with increasing fluency.	and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. 2/5 + 4/5 = 6/5 = 1 1/5).	Associate any fraction with division to calculate decimal fraction equivalents (e.g. 0.333333) for a simple fraction (e.g. 1/3).
Compare and order fractions	N/A	N/A	Compare and order unit fractions with the same denominator, to tenths, and place them on a blank number line.	Compare and order unit fractions with increasingly large denominators (including hundredths) and order on the number line.	Compare and order non-unit fractions whose denominators are all multiples of the same number with more than four fractions in a set. Use the greater than and less than symbols (<>) to construct number sentences incorporating fractions.	Compare and order fractions, including fractions > 1, those with mixed numbers, decimals and percentages.
Counting	N/A	Count in fractions up to 10, starting from any number and using the 1/2 and 2/4 equivalence on the number line (e.g. 1 1/4, 1 2/4 (or 1 1/2), 1 3/4, 2).	Count up and down in tenths fluently, recognising that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10.	Count fluently in fractions, including hundredths, recognising that hundredths arise when dividing an object or number by one hundred and dividing tenths by ten.	Continue to practice counting forwards and backwards in fractions to improve fluency.	Continue to practice counting forwards and backwards in fractions to improve fluency.

Finding fractions of amounts	N/A	Write simple fractions with numbers up to and including 100 (e.g. 1/2 of 30 = 15, 1/2 of 40 = 20, 1/2 of 50 = 25, 1/2 of 100 = 50. Recognise the equivalence of two quarters (2/4) and one half (1/2).	Recognise, find and write fractions of a discrete set of objects: unit and non-unit fractions including; halves, thirds, quarters, fifths, eighths and tenths.	Continue to find fractions of amounts, with unit and non-unit fractions, applying knowledge of the appropriate multiplication tables.	Continue to develop their understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities.	Use their understanding of the relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity (e.g. if 1/4 of a length is 36 cm then the whole length is 36 x 4 = 144 cm).
Adding and subtracting fractions	N/A	N/A	Add and subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7 and 1/3 + 2/3 make a whole).	Add and subtract fractions with the same denominator to become fluent through a variety of increasingly complex problems beyond one whole (e.g. 5/8 + 7/8 = 1 1/2, therefore 1 1/2 – 7/8 = 5/8).	Fluently add and subtract fractions with the same denominator and denominators that are multiples of the same number.	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
Multiplying and dividing fractions	N/A	N/A	N/A	N/A	Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	Multiply simple pairs of proper fractions, with any denominator, writing the answer in its simplest form. Divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6).
Ratio and proportion	N/A	N/A	N/A	N/A	N/A	Solve more complex problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication

						and division facts, including working backwards (e.g. In a class, 18 of the children in the class are boys. How many children are there altogether?). Solve more complex problems involving similar shapes where the scale factor is known or can be found (e.g. scale drawings of shapes with a scale factor of 2, meaning the new shape is twice the size, or a scale factor of 3, meaning the shape is 3 times the size). Solve increasingly complex problems involving unequal sharing and grouping, using knowledge of fractions and multiples (e.g. 2 diamond rings and 4 silver rings cost £1,440. A diamond ring and a silver ring cost £660. How much does a silver ring cost?).
Problem solving	N/A	N/A	Solve more complex problems, involving all of the above.	Solve simple measure and money problems involving fractions and decimals to two decimal places.	Solve problems that involve all of the above, including problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 3/4, 1/5, 2/5, 4/5 and those with a	Solve problems in context, involving all of the above.

					denominator of a multiple of 10 or 25.	
Multiplication & Division						
Multiplication & Division	Count in multiples of 2, 5 and 10 up to and including 100 (where appropriate).	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.	Recall and use multiplication and division facts for the 2, 3, 4, 5, 8 and 10 multiplication tables.	Recall multiplication and division facts for multiplication tables up to 12 x 12.	Improve speed of recall for multiplication and division facts for multiplication tables up to 12 x 12 and consolidate the related division facts. Derive multiplication and division facts for multiples of 10 and 100.	Improve speed of recall for multiplication and division facts for multiplication tables up to 12 x 12. Derive multiplication and division facts for 10, 100 and 1000 and for decimal numbers (e.g. 0.6 x 7 =4.2 and 0.6 x 0.7 = 0.42).
Multiplying and dividing mentally	Use mental strategies to double and half one and two-digit numbers to and including 50, using concrete objects and pictorial representation.	Calculate mathematical statements for multiplication and division within the 2, 5 and 10 multiplication tables.	Use the 2, 3, 4, 5, 8 and 10 multiplication tables, including for two-digit numbers times one-digit numbers. Multiply one-digit numbers by 2, 3, 4, 5, 8 and 10, using mental strategies.	Use place value, known and derived facts to multiply and divide mentally with numbers up to 12 x 12, including: – multiplying by 0 and 1 – dividing by 1 – multiplying together three numbers.	Multiply and divide numbers mentally, drawing upon known facts, including multiplying by multiple of 10 and 100.	Perform more complex mental calculations, including those with mixed operations, increasingly large numbers, negative numbers and decimals.
Multiplying and dividing using written methods	Use written strategies to double and half one and two-digit numbers to and including 50, using concrete and pictorial representation.	Show, with examples, that multiplication of two numbers in the 2, 5 and 10 times table can be done in any order (commutative) and division of one number by another cannot (e.g. 2 x 6 = 12 therefore 6 x 2 = 12 12 ÷ 6 = 2 5 x 3 = 15 therefore 3 x 5	Write and calculate mathematical statements for multiplication and division using multiplication tables that they know (2, 3, 4, 5, and 10). Progress to formal written methods to multiply two-digit	Multiply two-digit and three-digit numbers by and one-digit number, using formal written layout (demonstrating improved procedural fluency). Divide two-digit and three-digit numbers by any one-digit number using a formal written	Multiply multi-digit numbers (those with up to 4 digits) by a two digit whole number, using the formal written method of long multiplication. Divide numbers with up to four digits by a one-digit number, using the formal written method of short division and	Continue to multiply multi-digit numbers (those with up to four digits) by a two-digit whole number, using the formal written method of long multiplication to improve procedural fluency. Divide numbers with up to four digits by a two-digit whole number, using the formal written method of

		= 15 15 ÷ 5 = 3 6 x 10 = 60 therefore 10 x 6 = 60 60 ÷ 10 = 6).	numbers by a one-digit number (multiplying by 2, 3, 4, 5 and 8).	layout (including remainders).	interpret remainders appropriately according to context (including fractions, decimals and rounding).	long division, and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context. Use their knowledge of the order of operations to carry out calculations involving the four operations. Identify how the position of the brackets can affect the answer.
Estimating and checking	N/A	Recognise and use the inverse relationship between multiplication and division in calculations (working within the 2, 5 and 10 times tables).	Recognise and use the relationship between multiplication and division when performing calculations to check answers and written methods (when multiplying and dividing by 2, 3, 4, 5, 8 and 10).	Recognise and use the inverse relationship between multiplication and division when performing calculations, up to 12 x 12, to check answers and written methods (including two and three-digit numbers, multiplied and divided by any one-digit number).	Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	Continue to use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
Properties of number	N/A	Identify multiple of 2, 5 and 10. Recognise that multiples of 2 are always even, multiples of 5 always end with 0 or 5 and multiples of 10 always end in 0.	Identify, from a set of numbers, multiples of 2, 3, 4, 5, 8 and 10 by their properties (e.g. multiples of 8 are always multiples of 4).	Identify multiples of numbers up to 12 x 12 by their properties and make connections between certain times tables (e.g. multiples of 2, 4 and 8 are connected and multiples of 3, 6 and 9 are connected). Recognise and use factor pairs and	Identify multiples and factors, including finding all factor pairs of increasing large numbers and common factors of pairs of numbers. Recognise and use the vocabulary of prime numbers, prime factors	Identify common multiples, including finding the lease common multiple of two numbers (e.g. 20, 40, 60, 80 and 100 are common multiples of 4 and 5. The least common multiple is 20 as it is the smallest number). Identify common factors of pairs of numbers, including using factor trees to find

				commutativity in mental calculations for numbers up to 12 x 12 (e.g. 12 = 4 x 3 = 3 x 4)	and composite (non-prime) numbers. Establish whether a number up to 100 is prime and recall prime numbers up to 19. Recognise and use square numbers up to 12(^{2}) and cube numbers up to 10(^{3}) and the notation for squared and cubed numbers.	prime factors and prime factorisation of any number (e.g. 48 = 2 × 2 × 2 × 2 × 3). Use factors to find equivalent fractions and ratios, including cancelling fractions and ratios to their simplest form. Continue to establish whether numbers beyond 100 are prime and recall prime numbers to 30 to maintain fluency. Recognise and use square numbers to 20(^{2}) and cube numbers up to 20(^{3}) and use the notation for squared and cubed numbers in context, including algebra (e.g. n^2 + 30 = 79, what is the value of n?).
Place value	N/A	Multiply numbers to 20 by 10, beginning to understand the effect.	Recall and use multiplication and division facts for x10 and know the effect on the place value of the numbers being multiplied (e.g. 45 × 10 = 450 therefore 450 ÷ 10= 45).	Multiply and divide increasingly large numbers by 10, including solving problems which involve measures in context.	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 in context and apply to problem solving.	Continue to multiply and divide whole numbers and those involving decimals by 10, 100, 1000 and 10,000 in context and apply to problem solving.
Problem solving	Solve, with teacher support, simple one-step problems involving	Solve problems involving multiplication and division, using materials,	Solve problems, including missing number problems, involving	Solve problems involving multiplying and adding, using the	Solve problems involving multiplication and division where larger numbers are	Solve problems involving addition, subtraction, multiplication and division.

	multiplication and division, calculating the answer using concrete objects, pictorial representations and arrays.	arrays, repeated addition and mental methods for all the above. Solve problems in contexts when multiplying by 2, 5 and 10, including doubling and halving.	multiplying and dividing by 2, 3, 4, 5, 8 and 10. Solve problems including measuring and scaling contexts (e.g. 8 times as high, 10 times as long). Solve problems including correspondence in which n objects are connected to m objects (e.g. 3 hats and 4 coats, how many different outfits are possible?).	distributive and associative law, including two-step problems in context. Solve increasingly complex problems in context, including integer scaling. Solve harder correspondence problems with an increasing number of combinations and outcomes in which n objects are connected to m objects.	used, decomposing them into their factors in context. Solve multi-step problems involving addition, subtraction, multiplication and division and a combination of these. Explain the equals sign to indicate equivalence, including in missing number problems (e.g. 33 = 5 × ?). Solve more complex problems involving multiplication and division, including scaling by simple fractions involving simple rates to support the introduction of ratio in Y6 (e.g. adapting a simple recipe for more or fewer servings).	Systematically arrange the information in a problem, identifying and recording the steps needed to solve it, using symbols where appropriate. Interpret solutions in the original context, checking their accuracy. Organise written work systematically for a range of problem types. Independently review their work and strategies suggesting other problem solving strategies which they could have used.
Number & Place Value						
Identifying and representing numbers	Identify and represent numbers beyond 50 using concrete objects, pictorial representations and the number line. Confidently use the language of: equal to, more than, less than	Identify, represent and estimate numbers to 100 using different representations, including the number line. Recognise the place value of each digit in a	Identify, represent and estimate numbers to 1000 using different representations, including more complex number lines. Recognise the place value of each digit in a	Identify, represent and estimate numbers using different representations, showing some awareness of five-digit numbers.	Recognise the place value of each digit in numbers up to at least 1,000,000 with increasing fluency.	Recognise the place value of each digit in numbers up to at least 10,000,000 with increasing fluency. Identify the value of each digit in numbers with up to three decimal places.

	(fewer), most and least in other mathematical concepts with examples. Begin to recognise the place value of two-digit numbers (tens and ones to 20).	two-digit number (tens and ones).	three-digit number (hundreds, tens and ones), showing some awareness of thousand.	Recognise the place value of each digit in a four-digit number, beginning to show awareness of five-digit numbers.		
Comparing, reading and writing numbers	Read and write numbers to 100 in numerals. Read and write numbers from 1 to 20 in words (not necessarily spelt correctly).	Read and write numbers to at least 100 in numerals and words. Use place value to compare and order numbers from 0 up to 100. Use <, > and = signs to compare numbers up to 100.	Read and write numbers up to 1000 in numerals and words. Compare and order numbers up to 1000. Read Roman numerals to 12 (I to XII).	Order and compare numbers up to and including 10,000 with increasing fluency. Use the notation for negative numbers and identify numbers less than 0. Use the > and < signs to accurately compare pairs of numbers, including positive and negative integers. Read Roman numerals to 100 (I to C) and understand how, over time, the numeral system changed to include the concept of zero and place value.	Read, write, order and compare numbers up to at least 1,000,000 using > and < signs to make number sentences with more than two numbers, with increasing fluency. Interpret negative numbers in context. Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	Read, write, order and compare numbers up to and including 10,000,000 using > and < signs to make number sentences with more than two numbers, with increasing fluency. Use negative numbers in context, and calculate intervals across zero.
Counting	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.	Count fluently in steps of 2, 3 and 5 from 0, and count in tens from any	Count from 0 in multiples of 4, 8, 10, 50 and 100.	Count in multiples of 6, 7, 9, 25 and 1000.	Count forwards or backwards in steps of powers of 10 for any given number up to at	Use the whole number system, including counting, saying, reading and writing numbers accurately.

	Given a number, identify 1 more and 1 less with numbers up to 100.Count in different multiples, including ones, twos, fives and tens.	number, forward or backward.	Find 10 or 100 more/less than a given number.	Count backwards in ones through zero to include negative numbers. Find 10, 100 or 1000 more or less than a given number, (beginning to work with five-digit numbers).	least 1,000,000 with increasing fluency. Count forwards and backwards with positive and negative whole numbers through zero, in context, and apply to solving simple problems (e.g. involving temperature).	
Rounding	N/A	N/A	Round numbers up to 1000 to the nearest 10.	Round any four-digit number to the nearest 10, 100 or 1000.	Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000, 100,000.	Round any whole number to a required degree of accuracy.
Problem solving	Use place value and number facts to solve simple concrete and pictorial problems, involving all of the above.	Use place value and number facts to solve problems that involve all of the above.	Solve number and practical problems that involve all of the above.	Solve number and practical problems that involve all of the above.	Solve number and practical problems that involve all of the above.	Solve number and practical problems that involve all of the above.

Aspect (PROBLEM SOLVING, DEPTH & FLUENCY)	Key Stage 1 Essential Skills		Lower Key Stage 2 Essential Skills		Upper Key Stage 2 Essential Skills	
	End of Year 1 Expectations	End of Year 2 Expectation	End of Year 3 Expectation	End of Year 4 Expectations	End of Year 5 Expectations	End of Year 6 Expectations
Interpretation	Begin to make simple mathematical connections and apply their knowledge to similar situations. Talk about a simple problem, with adult support (e.g. responding to simple questions).	Make mathematical connections and apply their knowledge to similar situations. Use concrete resources and pictorials to find a starting point, identifying key facts/relevant information. Describe ways of solving simple problems orally or using concrete resources and pictures.	Interpret and use mathematical symbols and diagrams. Use pictures, diagrams and symbols to communicate their thinking/demonstrate a solution or process. Describe ways of solving problems, explaining choices and decisions orally or using concrete resources and pictures.	Interpret and describe methods, choices and solutions to puzzles and problems, orally and in writing, using pictures, diagrams and symbols. Recognise information in one-step problems that is key to solving the problem.	Interpret problems, giving clear explanations and reasoning, orally and in writing, using diagrams and symbols. Recognise and obtain information that is key to solving a problem. Pose similar problems for a partner to solve.	Explain and interpret problems using diagrams, graphs and text; refine ways of recording using images and symbols. Recognise and obtain necessary information to carry through a task and solve mathematical problems. Continue to pose similar problems for a partner to solve.
Reasoning	Begin to describe simple methods used for basic number problems. Listen to others' explanations and try to make sense of them.	Describe solutions to number and practical problems, drawing on experience, talking about their own ideas, methods and choices. Talk about simple problems and compare answers.	Describe methods they use in their work for simple number problems and begin to test and explain simple mathematical statements (e.g. the number 12 is even so 12 counters can't be shared between 3 children). Listen to others' explanations of simple	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. Discuss their work, beginning to explain their reasoning.	Test and explain mathematical statements (e.g. when you divide an even number by an odd number there is always a remainder). Put a mathematical problem into their own words.	Respond to 'What if? questions using mathematical reasoning. Reword a mathematical problem and explain to others how the problem can be solved. Listen to others' explanations of problems and compare and evaluate

			problems and compare answers.		Talk about findings and solutions with reference to methods used.	answers, methods and strategies used. Draw simple conclusions and give an explanation of reasoning with examples, including related conjectures.
Recording, presenting and organising	Use role play and concrete resources to represent a simple problem. Represent a mathematical problem using concrete resources or pictures to communicate their ideas. Make simple jottings to record results using pictorial representation.	Use role play and concrete resources to represent a simple problem, identifying key facts/relevant information. Draw pictures, diagrams and symbols to communicate thinking or demonstrate a solution or process. Make simple jottings to record results using pictorial representation and number symbols.	Begin to develop their own methods of recording. Present solutions to simple problems in an organised way (e.g. partitioning numbers to add or subtract). Begin to explain decisions, methods and results in pictorial, spoken or written form, using mathematical language and number sentences.	Begin to organise written work systematically (e.g. record results in order). Present solutions to simple problems in an organised way and explain decisions, methods and results in pictorial, spoken or written form, using mathematical language and number sentences.	Organise written work systematically for a range of problem types (e.g. adjust accordingly when using trial and error). Represent a puzzle or problem by identifying and recording the information or calculations needed to solve it; find possible solutions and confirm them in the context of the problem.	Organise written work systematically, from the onset, for a range of problem types. Decide upon the best way to represent their conclusions, using appropriate recording. Tabulate systematically the information in a puzzle or problem. 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.
Problem solving strategies	Use concrete resources (e.g. cubes, counters, numicon) and pictorial representation to solve simple problems.	Use structured apparatus (e.g. counters, money, numicon, dienes, place value cards, 100 square/number line) and	Choose and use structured apparatus, appropriate to task, to support problem solving.	Begin to use trail and error when problem solving.	Search for a solution by trying out ideas of their own and adjust accordingly.	Identify information that is necessary to solve a problem and determine what is missing.

		pictorial representation to solve simple problems. Begin to make their own suggestions of ways to tackle simple problems.	Make their own suggestions and use their own strategies to tackle problems. Identify simple patterns in results.	Try different approaches and find ways of overcoming difficulties that arise when they are solving problems. Identify simple patterns in results and use them to find other possible outcomes.	Begin to adopt a suggested model or systematic approach. Identify patterns as they work and use these patterns to find other outcomes. Make generalisations with the assistance of probing questions and prompts. Evaluate their work and strategies independently.	Break a problem into simpler steps before solving. Identify patterns as they work and form their own generalisations/rules in words. Review their own work and strategies independently and suggest other problem solving strategies which they could have used. Begin to understand and use simple formulae and symbols to represent and solve problems.
Estimating and checking	Estimate relative sizes and amounts.	Check their work and make appropriate corrections.	Begin to estimate the answer to a calculation. Compare their estimate and the actual answer.	Estimate and check answers and ensure solutions make sense in the context of the problem.	Use rounding techniques to estimate an answer and then decide if it is reasonable.	Use a range of rounding techniques to estimate, calculate and check, including rounding decimals and fractions.

Aspect (MEASUREMENT, GEOMETRY & STATISTICS)	Key Stage 1 Essential Skills		Lower Key Stage 2 Essential Skills		Upper Key Stage 2 Essential Skills	
	End of Year 1 Expectations	End of Year 2 Expectation	End of Year 3 Expectation	End of Year 4 Expectations	End of Year 5 Expectations	End of Year 6 Expectations
Measurement						
Length/height (including area and perimeter)	Compare, describe and solve practical problems for lengths and heights (e.g. long/short, longer/shorter, tall/short, double/half). Measure with a ruler and begin to record lengths and heights in standard units of measure.	Compare and order lengths/heights and record the results using >, < and =. Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm) to the nearest appropriate unit using rulers and tape measures with increasing accuracy.	Measure, compare, add and subtract lengths (m/cm/mm) with increasing fluency, including with mixed units. Measure the perimeter of simple 2-D shapes in m/cm/mm and record results independently.	Convert between different units of measure: centimetres to millimetres, centimetres to metres, kilometres to metres and vice versa with increasing fluency. Measure and calculate the perimeter of any rectilinear figure in centimetres and metres and express the formula for perimeter algebraically as 2(a + b), where a and b are the dimensions in the same unit. Find the area of rectilinear shapes by counting whole and half centimetre squares and recognise that area relates to arrays and multiplication.	Convert between different units of metric measure (e.g. kilometres and metres; centimetres and metres; centimetres and millimetres) fluently, with increasingly large numbers. Recognise and use approximate equivalences between metric units and common imperial units, such as inches and feet, with increasing fluency. Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres, including finding missing lengths (e.g. missing measures questions can be expressed algebraically: 4 + 2b = 20 for a rectangle of sides 2cm and b cm and perimeter of 20 cm). Calculate and compare the area of rectangles	Use, read, write and convert between standard units, converting measurements of length from a smaller unit of measure to a larger unit and vice versa, using decimal notation up to three decimal places with increasing fluency. Convert between miles and kilometres accurately and connect to a linear graphical representation. Recognise and explain, using examples how shapes with the same areas can have different perimeters and vice versa. Calculate the area of parallelograms and triangles. Use formulae for the area of rectangles, squares, irregular shapes triangles and parallelograms.

					(including squares), using standard units, square centimetres (cm^2) and square metres (m^2). Estimate the area of irregular shapes, including finding missing lengths and calculating the area of scale drawings.	
Mass and weight	Compare, describe and solve practical problems for mass or weight (e.g. heavy/light, heavier than, lighter than). Measure using simple scales and equipment and begin to record mass/weight in standard units of measure.	Compare and order mass and record the results using >, < and =. Choose and use appropriate standard units to estimate and measure mass (grams/kilograms) to the nearest appropriate unit using scales.	Measure, compare, add and subtract mass (kg/g) with increasing fluency, including with mixed units.	Convert between different units of measure: grams to kilograms and vice versa with increasing fluency.	Convert between different units of metric measure (e.g. grams, kilograms and tonnes) fluently, with increasingly large numbers. Recognise and use approximate equivalences between metric units common imperial units, such as ounces and pounds, with increasing fluency.	Use, read, write and convert between standard units, converting measurements of mass from a smaller unit of measure to a larger unit, and vice versa, using decimal notation up to three decimal places with increasing fluency.
Capacity and volume	Compare, describe and solve practical problems for capacity/volume (e.g. full/empty, more than, less than, half, quarter). Measure using simple scales and equipment and begin to	Compare and order capacity/volume and record the results using >, < and =. Choose and use appropriate standard units to estimate and measure temperature (°C) and capacity/volume (litres/ml) to the nearest	Measure, compare, add and subtract volume/capacity (l/ml) with increasing fluency, including with mixed units.	Convert between different units of measure: millilitres to litres with increasing fluency.	Convert between different units of metric measure (e.g. litres and millilitres) fluently, with increasingly large numbers. Recognise and use approximate equivalences between metric units and common imperial units,	Use, read, write and convert between standard units, converting measurements of volume from a smaller unit of measure to a larger unit, and vice versa, using decimal notation up to three decimal places with increasing fluency.

	record capacity and volume in standard units of measure.	appropriate unit, using thermometers and measuring vessels.			such as pints, with increasing fluency. Estimate volume (e.g. using 1 cm^3 blocks to build cuboids, including cubes) and capacity (e.g. using water) with increasing accuracy.	Recognise and use the formulae for volume of shapes (cubes, cuboids and square-based pyramids). Calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3) and extending to other units, such as mm^3 and km^3.
Time	Sequence a number of events in chronological order using language, such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening. Recognise and use language relating to dates, including days of the week, weeks, months and years with increasing fluency. Compare, describe and solve practical problems for time (e.g. quicker, slower, earlier, later).	Compare and sequence intervals of time, including times to five minutes. Tell and write the time to five minutes, including quarter past/to the hour and recognise and draw the hands on a clock face independently to show these times, recording them with increasing fluency. Recall the number of seconds in a minute, minutes in an hour and hours in a day, and apply to simple time problems.	Compare durations of events (e.g. to calculate the time taken for a journey), including finding time differences within 12 hours. Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks. Estimate and read time with increasing accuracy to the nearest minute. Record and compare time in terms of seconds, minutes and hours.	Convert between different units of measure: hours to minutes (any number e.g. – 128 minutes = 2 hour 8 minutes – 214 minutes = 3 hours 34 minutes). Read, write and convert time between analogue and digital 12 and 24-hour clocks with increasing fluency. Solve problems involving converting from hours to minutes; minutes to seconds; years	Solve problems involving converting between units of time, including interpreting simple timetables (including all units of time).	Use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa, and make approximate conversions to tell if an answer is sensible.

	Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. Measure and record time (hours, minutes, seconds).		Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight. Recall the number of seconds in a minute, minutes in an hour, hours in a day and days in each month, year and leap year and apply to solving time problems.	to months; weeks to days.		
Money	Recognise and know the value of different denominations of coins (including counting coins), 1p, 2p, 5p, 10p, 20p, 50p, £1, £2 and notes.	Recognise and use symbols for pounds (£) and pence (p), combine amounts to make a particular value and record pounds and pence separately. Find different combinations of coins (beyond five pounds) that equal the same amounts of money. Solve simple problems in a practical context, involving addition and subtraction of money of the same unit, including giving change.	Add and subtract amounts of money to give change, using both £ and p in practical contexts, including formal written methods (carrying and exchanging when necessary).	Estimate, compare and calculate different measures, including money in pounds and pence, with increasing fluency when using decimal notation.	Continue to solve problems involving money, using all four operations.	Solve problems involving money, including all four operations and fractions and percentages of amounts.
Problem solving	Solve simple problems involving all of the above.	Solve simple problems involving all of the above.	Solve simple problems involving all of the above.	Solve simple problems involving all of the above.	Use all four operations to solve problems for all of the above, using decimal	Solve problems for all of the above, involving the calculation and conversion

					notation, including scaling.	of units of measure, using decimal notation to three decimal places where appropriate.
Geometry						
Identifying, recognising and naming shapes	Recognise and name common 2-D shapes, including: rectangles, squares, circles and triangles in different orientations and sizes and fluently relate them to everyday objects. Recognise and name common 3-D shapes, including: cuboids, cubes, pyramids and spheres in different orientations and sizes and fluently relate them to everyday objects.	Identify and describe the properties of 2-D shapes, including the number of sides and symmetry in a vertical line (e.g. quadrilaterals and polygons). Identify and describe the properties of 2-D shapes on the surface of 3-D shapes (e.g. a circle on a cylinder and a triangle on a pyramid) and use basic language, such as: sides, edges, vertices and faces.	Recognise and name symmetrical and non-symmetrical polygons and polyhedral and describe their properties using accurate language when describing the angles, edges vertices and measurements. Continue to identify, name and describe 3-D shapes, including: cones, cylinders, prisms, pyramids, cubes, cuboids, spheres.	Identify and name regular and irregular polygons, including quadrilaterals (square, rectangle, parallelogram, rhombus, trapezium, isosceles trapezium, kite) and equilateral, isosceles, scalene and right angle triangles. Continue to identify, describe and name 3-D shapes (cones, cylinders, prisms, pyramids, cubes, cuboids, spheres, hemispheres, tetrahedrons).	Identify 3-D shapes, including cubes and other cuboids, from 2-D representations, including constructing the net of a cube or cuboid.	Recognise, describe, draw and build simple 3-D shapes, including making nets with increasing accuracy. Illustrate and name parts of circles, including radius, diameter and circumference and begin to recognise that the circumference can be calculated using a given formula.
Properties of shape	N/A	Compare, sort and describe common 2-D shapes and 3-D shapes and everyday objects by the number of sides, faces, edges, vertices and lines of symmetry. Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces	Continue to compare, sort and describe the properties of 2-D shapes and 3-D shapes using precise terminology, including length of lines and acute and obtuse for angles greater or lesser than a right angle.	Compare and classify geometric shapes, including quadrilaterals (square, rectangle, parallelogram, rhombus, trapezium, isosceles trapezium, kite) and triangles (isosceles, equilateral, scalene, right angle triangle), based on their properties and sizes.	Use the properties of quadrilaterals (squares, rectangles, rhombuses, parallelograms) and triangles to deduce related facts and find missing lengths and angles. Distinguish between regular and irregular polygons based on	Compare and classify geometric shapes based on their properties and sizes and explain how unknown angles in any triangles, quadrilaterals, and regular polygons can be derived from known measurements. Express these relationships algebraically (e.g. $d = 2 \times r$, $a = 180 - (b + c)$).

		using precise terminology.			reasoning about equal sides and angles.	
Drawing shapes	N/A	Draw lines and shapes using a ruler.	Draw 2-D shapes accurately and connect decimals and rounding to drawing and measuring straight lines in centimetres in a variety of contexts (e.g. rounding mm on a ruler to the nearest cm). Make 3-D shapes using modelling materials and name and describe their properties using accurate language when describing the angles, edges, vertices and measurements.	N/A	Draw and construct quadrilaterals and triangles using given dimensions and angles with increasing accuracy.	Draw any 2-D shapes using given dimensions with increasing accuracy (to the nearest millimetre), using conventional markings for parallel lines and right angles.
Angles	N/A	N/A	Recognise angles as a property of shape or a description of a turn and recognise if angles are obtuse or acute. Identify right angles and recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn.	Identify and estimate acute and obtuse angles in polygons to compare length of sides to decide if a polygon is regular or irregular, and compare and order angles up to two right angles by size.	Recognise that angles are measured in degrees: estimate and compare acute, obtuse and reflex angles with increasing accuracy and fluency. Draw given angles and measure them in degrees (°), including acute, obtuse and reflex angles with increasing accuracy and fluency.	Recognise angles where they meet at a point, are on a straight line or vertically opposite, and derive missing angles with increasing fluency.

			Identify whether angles are greater than or less than a right angle. Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.		Identify: -angles at a point and one whole turn (total 360°) -angles at a point on a straight line and ½ a turn (total 180°) – other multiples of 90° and 45° turns.	
Symmetry	N/A	N/A	N/A	Identify lines of symmetry in any 2-D shape presented in different orientations. Complete a symmetric figure with respect to a vertical, horizontal or diagonal line of symmetry.	Continue to draw simple symmetric figures, of increasing complexity, with respect to a specific line of symmetry, including diagonal mirror lines.	Continue to draw symmetric figures with respect to a specific line of symmetry, including diagonal lines and reflecting in four quadrants.
Position and direction	Describe position, direction and movement, progressing to whole, half, quarter and three-quarter turns.	Use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (e.g. children themselves moving in turns, giving instructions to other children to do so and programming robots, using instructions given in right angles).	Continue to use the concept and language of angles to describe position and direction to improve fluency.	Plot specified points and draw sides to complete a given polygon. Describe movements between positions as translations of a given unit to the left/right and up/down with increasing fluency.	Identify, describe (using the related mathematical vocabulary) and represent the position of a shape following a reflection or translation and know that the shape has not changed.	Draw and label a pair of axes in all four quadrants with equal scaling and describe positions on the full coordinate grid (including the use of negative numbers). Draw and translate shapes on the coordinate plane, and reflect them in the axes (expressed algebraically e.g. translating vertex (a, b) to (a – 2, b + 3); (a, b) and

		Order and arrange combinations of mathematical objects in patterns and sequences, including those in different orientations.				(a + d, b + d) being opposite vertices of a square of side d).
			Statistics			
Recording and organising	N/A	Construct simple pictograms, tally charts, block diagrams and simple tables.	Present data using bar charts, pictograms and tables.	Present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.	Read and complete information in a range of tables, including timetables, recording work systematically. Construct simple line graphs within a given context and connect work on coordinates to their interpretation of time graphs.	Construct pie charts and line graphs and use these to solve problems, making connections to angles, fractions and percentages.
Interpreting	N/A	Interpret simple pictograms, tally charts, block diagrams and simple tables. Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. Ask and answer questions about totalling	Interpret data using bar charts, pictograms and tables.	Interpret discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.	Read, complete and interpret information in tables, including timetables. Connect interpretations of time graphs to work on coordinates and scales, thinking about and using appropriate units. Interpret simple line graphs within a given context and connect work on coordinates to their	Interpret pie charts and line graphs and use these to solve problems, making connections to angles, fractions and percentages.

		and compare categorical data.			interpretation of time graphs.	
Using statistics and problem solving	N/A	N/A	Solve one-step and two-step questions, using information presented in scaled bar charts, pictograms and tables (e.g. 'How many more?' and 'How many fewer?').	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and graphs.	Solve comparison, sum and difference problems using information presented in a line graph. Decide which representations of data are the most appropriate to support the conclusion and state the reasons why.	Solve comparison, sum and difference problems using information presented in line graphs, pie charts and graphs with two sets of data.
Averages	N/A	N/A	N/A	N/A	N/A	Calculate the mean with increasingly large numbers, including decimals and negative numbers.