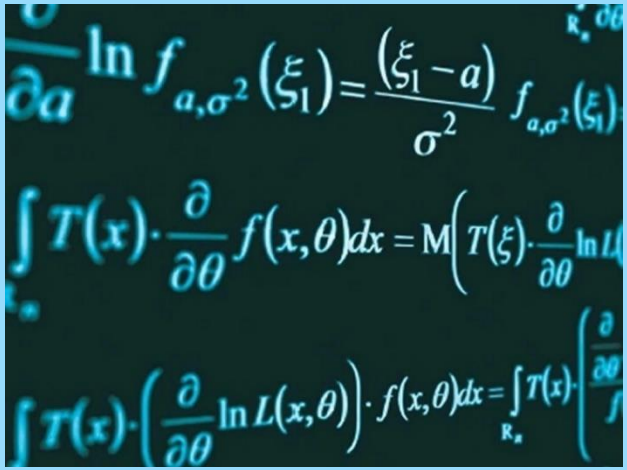
# Curriculum Skills and Progression Map
# Mathematics




Nebula
where stars are born

**The Nebula Federation**

**Horsford CE VA Primary School**

# Number: Number and Place Value

| KEY SKILLS | | |
|---|---|---|
| **Reception** | **Year 1** | **Year 2** |
| **Counting** | | |
| Count reliably with numbers to 20 and place them in order.<br>Count an irregular amount of objects. | count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number | |
| | count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens | count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward |
| Can say which number is one more or one less than a given number | given a number, identify one more and one less | |
| **Comparing numbers** | | |
| Use the language 'more' and 'fewer' to compare two sets of objects. | use the language of: equal to, more than, less than (fewer), most, least | compare and order numbers from 0 up to 100; use <, > and = signs |
| **Identifying, representing and estimating numbers** | | |
| Select the correct numeral to represent numbers to 20.<br>Estimate how many objects they can see and checks by counting. | identify and represent numbers using objects and pictorial representations including the number line | identify, represent and estimate numbers using different representations, including the number line |
| **Reading and writing numbers (including Roman Numerals)** | | |
| | read and write numbers from 1 to 20 in numerals and words. | read and write numbers to at least 100 in numerals and in words |
| **Understanding Place Value** | | |
| | | recognise the place value of each digit in a two-digit number (tens, ones) |
| **Problem Solving** | | |
| Begin to identify own mathematical problems based on own interests and fascinations. | | use place value and number facts to solve problems |

| Greater depth | Greater depth | Greater depth |
|---|---|---|
| Estimate a number of objects and check quantities by counting up to 20.<br>Solve practical problems that involve combining groups of 2, 5 or 10. | Count reliably well beyond 100.<br>Count on and back in 3's from any given number to beyond 100.<br>Say the number that is ten more or ten less than a number to 100.<br>Know the signs < and >. | Reason with numbers showing an understanding of place value. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Zero, number, one, two, three….to twenty and beyond, count, count on, count back, is the same as, more, less, pattern, digit, the same number as, more, larger, bigger, greater, fewer, smaller, less, fewest, smallest, least, most, biggest, largest, greatest, one more, one less, compare, order, size, first, second, third…twentieth, last, before, after, next, between.<br>Guess, estimate, nearly, close, about the same as, just over, just under, too many, too few, enough, not enough. | Numeral, twenty one, twenty two…one hundred, forwards, backwards, equal to, equivalent to, most, least, many, multiple of, half way between, above, below, roughly. | Two hundred….one thousand, threes, fours, tally, sequence, continue, predict, rule, >greater than, <less than, hundreds, one digit, two digit, three digit number, place, place value, stands for, represents, exchange, twenty first, twenty second…exact, exactly. |

# Number: Number and Place Value

| KEY SKILLS | | | |
|---|---|---|---|
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Counting** | | | |
| | count backwards through zero to include negative numbers | interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero | use negative numbers in context, and calculate intervals across zero |
| count from 0 in multiples of 4, 8, 50 and 100; | count in multiples of 6, 7, 9, 25 and 1 000 | count forwards or backwards in steps of powers of 10 for any given number up to 1000 000 | |
| find 10 or 100 more or less than a given number | find 1000 more or less than a given number | | |
| **Comparing numbers** | | | |
| compare and order numbers up to 1000 | order and compare numbers beyond 1000<br>compare numbers with the same number of decimal places up to two decimal places | read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) | read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) |
| **Identifying, representing and estimating numbers** | | | |
| identify, represent and estimate numbers using different representations | identify, represent and estimate numbers using different representations | | |
| **Reading and writing numbers (including Roman Numerals)** | | | |
| read and write numbers up to 1000 in numerals and in words | read Roman numerals to 100 (I to C) and know that over time, the | read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit | read, write, order and compare numbers up to |

| | | | |
|---|---|---|---|
| | numeral system changed to include the concept of zero and place value. | (appears also in Comparing Numbers) | 10 000 000 and determine the value of each digit (appears also in Understanding Place Value) |
| tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks (copied from Measurement) | | read Roman numerals to 1000 (M) and recognise years written in Roman numerals. | |
| **Understanding Place Value** | | | |
| recognise the place value of each digit in a three-digit number (hundreds, tens, ones) | recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) | read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) | read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) |
| | 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 units, tenths and hundredths (copied from Fractions) | recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (copied from Fractions) | identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1 000 where the answers are up to three decimal places (copied from Fractions) |
| **Rounding** | | | |
| | round any number to the nearest 10, 100 or 1 000 | round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000 | round any whole number to a required degree of accuracy |
| | round decimals with one decimal place to the nearest whole number (copied from Fractions) | round decimals with two decimal places to the nearest whole number and to one decimal place (copied from Fractions) | solve problems which require answers to be rounded to specified degrees of accuracy (copied from Fractions) |
| **Problem Solving** | | | |
| solve number problems and practical problems involving these ideas. | solve number and practical problems that involve all of the above and with increasingly large positive numbers | solve number problems and practical problems that involve all of the above | solve number and practical problems that involve all of the above |

| Greater depth | Greater depth | Greater depth | Greater depth |
|---|---|---|---|
| Recognise the value of each digit in a four-digit number and the value of a tenth.<br>Begin to have an understanding about negative numbers, recognising they are smaller than 0. | Round any number to 100, 000 to the nearest 10, 100, 1000 or 10, 000.<br>Use tenths, hundredths and thousands when comparing values. | Have a concept of numbers well beyond 1, 000, 000 and their relative association to distances to planets, historical data and geographical aspects.<br>Use rounding as a strategy for quickly assessing what approximate answers ought to be, before calculating.<br>Link working across 0 for positive and negative numbers to work time between BC and AD in history. | Use the symbols =, ≠, ≤, ≥ correctly. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Count in fours, eighths, fifties….hundreds, factor of, relationship, roman numerals, one hundred more, one hundred less, approximate, approximately, round, nearest, round to the nearest ten/ hundred, round up, round down. | Ten thousand, hundred thousand, million, count in sixes, sevens, nines, twenty five, next, consecutive, integer, positive, negative, above/below zero, minus, negative numbers, one thousand more, one thousand less, thousand. | Factor pair, greater than or equal to, less than or equal to, formula, divisibility, square number, prime number, ascending/ descending order, ten thousand. | Factorise, prime factor, digit total. |

# Number: Addition and Subtraction

| KEY SKILLS | | |
|---|---|---|
| **Reception** | **Year 1** | **Year 2** |
| **Number bonds** | | |
| | represent and use number bonds and related subtraction facts within 20 | recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 |
| **Mental Calculation** | | |
| Finds the total number of items in two groups by counting all of them.<br>In practical activities and discussion, begin to use the vocabulary involved in adding and subtracting.<br>Add and subtract two single digit numbers.<br>Count on or back to find the answer to addition and subtraction questions. | add and subtract one-digit and two-digit numbers to 20, including zero | *add and subtract numbers using concrete objects, pictorial representations, and mentally, including:<br>* a two-digit number and ones<br>* a two-digit number and tens<br>* two two-digit numbers<br>adding three one-digit numbers |
| | read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods) | show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot |
| **Written Methods** | | |
| | read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs<br>(appears also in Mental Calculation) | |
| **Inverse operations, estimating and checking answers** | | |
| | | recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. |

| Problem Solving | | |
|---|---|---|
| | solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as<br>7 = □ - 9 | solve problems with addition and subtraction:<br>*using concrete objects and pictorial representations, including those involving numbers, quantities and measures<br>*applying their increasing knowledge of mental and written methods<br>solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (copied from Measurement) |
| **Greater depth** | **Greater depth** | **Greater depth** |
| Solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups. | Apply knowledge of number to solve a one-step problem involving addition and subtraction.<br>Add and subtract one digit and two digit numbers to 50, including 0. | Use reasoning about numbers and relationships to solve more complex problems and explain their thinking.<br>Solve unfamiliar word problems that involve more than one step. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Add, more, and, make, sum, total, altogether, double, one more… take away, one less, difference between. | Addition, near double, half, halve, subtract, equals, is the same as, number bonds/ pairs, missing number. | Ten more, ten less, facts. |

# Number: Addition and Subtraction

| KEY SKILLS | | | |
|---|---|---|---|
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Mental Calculation** | | | |
| add and subtract numbers mentally, including:<br>* a three-digit number and ones<br>* a three-digit number and tens<br>* a three-digit number and hundreds | | add and subtract numbers mentally with increasingly large numbers | perform mental calculations, including with mixed operations and large numbers |
| | | | use their knowledge of the order of operations to carry out calculations involving the four operations |
| **Written Methods** | | | |
| add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction | add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate | add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) | |
| **Inverse operations, estimating and checking answers** | | | |
| estimate the answer to a calculation and use inverse operations to check answers | estimate and use inverse operations to check answers to a calculation | use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy | use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy. |

| Problem Solving | | | |
|---|---|---|---|
| solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction | solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why | solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why | solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why<br>Solve problems involving addition, subtraction, multiplication and division |
| **Greater depth** | **Greater depth** | **Greater depth** | **Greater depth** |
| Add and subtract numbers with any number of digits using formal written methods. | Use tenths, hundreds and thousandths when solving addition and subtraction problems.<br>Solve multi-step problems involving more than one of the operations. | Calculate number problems algebraically for example 2x-3=5. | |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Tens boundary, hundreds boundary, complex, operations. | Inverse | Units boundary, tenths boundary. | |

# Number: Multiplication and Division

| KEY SKILLS | | |
|---|---|---|
| **Reception** | **Year 1** | **Year 2** |
| **Multiplication and division facts** | | |
| | count in multiples of twos, fives and tens (copied from Number and Place Value) | count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward (copied from Number and Place Value) |
| | | recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers |
| **Mental Calculation** | | |
| | | show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot |
| **Written Calculation** | | |
| | | calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs |
| **Problem Solving** | | |
| Solve problems , including doubling, halving and sharing. | solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher | solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts |

| Greater depth | Greater depth | Greater depth |
|---|---|---|
| Solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups. | Apply knowledge of number to solve a one step problem involving simple multiplication and division. | Recall and use multiplication and division facts for 2, 5 and 10, and make deductions outside known multiplication facts.<br>Solve unfamiliar word problems that involve more than one step. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Sharing, doubling, halving, number patterns. | Multiplication, multiply, multiplied by, multiple, division, dividing, grouping, array. | Groups of, times, once, twice, three times…ten times, repeated addition, divide, divided by, divided into, share, share equally, left over, one each, two each…group in pairs, threes…equal groups of, row, column, multiplication table, fact. |

# Number: Multiplication and Division

| KEY SKILLS | | | |
|---|---|---|---|
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Multiplication and division facts** | | | |
| *count from 0 in multiples of 4, 8, 50 and 100* (copied from Number and Place Value) | *count in multiples of 6, 7, 9, 25 and 1 000* (copied from Number and Place Value) | *count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000* (copied from Number and Place Value) | |
| recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables | recall multiplication and division facts for multiplication tables up to 12 × 12 | | |
| **Mental Calculation** | | | |
| write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods) | use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers | multiply and divide numbers mentally drawing upon known facts | perform mental calculations, including with mixed operations and large numbers |
| | recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers) | multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 | *associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^{3}/_{8}$)* (copied from Fractions) |
| **Written Calculation** | | | |
| write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods) | multiply two-digit and three-digit numbers by a one-digit number using formal written layout | multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers | multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication |
| | | divide numbers up to 4 digits by a one-digit number using the formal written method of | divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate |

| | | | |
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| | | short division and interpret remainders appropriately for the context | for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context |
| | | | *use written division methods in cases where the answer has up to two decimal places* (copied from Fractions (including decimals)) |
| **Properties of numbers: Multiples, factors, primes, square and cube numbers** | | | |
| | recognise and use factor pairs and commutativity in mental calculations (repeated) | identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. | identify common factors, common multiples and prime numbers |
| | | know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers | *use common factors to simplify fractions; use common multiples to express fractions in the same denomination* (copied from Fractions) |
| | | establish whether a number up to 100 is prime and recall prime numbers up to 19 | |
| | | recognise and use square numbers and cube numbers, and the notation for squared ($^2$) and cubed ($^3$) | *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 $km^3$* (copied from Measures) |
| **Order of operations** | | | |
| | | | use their knowledge of the order of operations to carry out calculations involving the four operations |
| **Inverse operations, estimating and checking answers** | | | |
| *estimate the answer to a calculation and use inverse operations to check answers* (copied from Addition and Subtraction) | *estimate and use inverse operations to check answers to a calculation* (copied from Addition and Subtraction) | | use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy |

| Problem Solving | | | |
|---|---|---|---|
| solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects | solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects | solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes | solve problems involving addition, subtraction, multiplication and division |
| | | solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign | |
| | | solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates | *solve problems involving similar shapes where the scale factor is known or can be found*<br>(copied from Ratio and Proportion) |
| **Greater depth** | **Greater depth** | **Greater depth** | **Greater depth** |
| Know all multiplication facts up to 12x12 and be able to instantaneously answer questions such as how many 7's in 42.<br>Multiply and divide any two digit number by a single digit number and have an understanding of remainder. | Solve multi-step problems involving more than one of the operations.<br>Rapidly recall answer when multiplying and diving a whole or decimal number by 10. | Divide whole numbers (up to 4 digits) by 2 digit numbers using preferred method.<br>Recognise the symbol for square root and work out square roots for numbers up to 100. | Multiply all integers (using efficient written methods) including mixed numbers and negative numbers.<br>Move beyond squared and cubed numbers to calculate problems such as X x 10n where n is positive. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Factor, product, remainder. | Inverse, square, squared, cube, cubed. | | |

# Number: Fractions (including decimals and percentages)

| KEY SKILLS | | |
|---|---|---|
| **Reception** | **Year 1** | **Year 2** |
| **Counting in fractional steps** | | |
| | | Pupils should count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line *(Non Statutory Guidance)* |
| **Recognising fractions** | | |
| Solve problems that involving halving. | recognise, find and name a half as one of two equal parts of an object, shape or quantity | recognise, find, name and write fractions $^{1}/_{3}$, $^{1}/_{4}$, $^{2}/_{4}$ and $^{3}/_{4}$ of a length, shape, set of objects or quantity |
| | recognise, find and name a quarter as one of four equal parts of an object, shape or quantity | |
| **Equivalence (including fractions, decimals and percentages)** | | |
| | | write simple fractions e.g. $^{1}/_{2}$ of 6 = 3 and recognise the equivalence of $^{2}/_{4}$ and $^{1}/_{2}$. |
| **Greater depth** | **Greater depth** | **Greater depth** |
| | | Find and compare fractions of amounts. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Parts of a whole, half, quarter. | Fraction, equal part, equal grouping, equal sharing, one of two equal parts, one of four equal parts. | Equivalent fraction, numerator, denominator, two halves, two quarters, three quarters, one third, two thirds, one of three equal parts. |

# Number: Fractions (including decimals and percentages)

| KEY SKILLS | | | |
|---|---|---|---|
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Counting in fractional steps** | | | |
| count up and down in tenths | count up and down in hundredths | | |
| **Recognising fractions** | | | |
| recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators | recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten | recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents<br>(appears also in Equivalence) | |
| recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10. | | | |
| recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators | | | |
| **Comparing fractions** | | | |
| compare and order unit fractions, and fractions with the same denominators | | compare and order fractions whose denominators are all multiples of the same number | compare and order fractions, including fractions >1 |
| **Comparing decimals** | | | |
| | compare numbers with the same number of decimal places up to two decimal places | read, write, order and compare numbers with up to three decimal places | identify the value of each digit in numbers given to three decimal places |
| **Rounding including decimals** | | | |
| | round decimals with one decimal place to the nearest whole number | round decimals with two decimal places to the nearest whole number and to one decimal place | solve problems which require answers to be rounded to specified degrees of accuracy |
| **Equivalence (including fractions, decimals and percentages)** | | | |
| recognise and show, using diagrams, equivalent fractions with small denominators | recognise and show, using diagrams, families of common equivalent fractions | identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths | use common factors to simplify fractions; use common multiples to express fractions in the same denomination |

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| | recognise and write decimal equivalents of any number of tenths or hundredths | read and write decimal numbers as fractions (e.g. 0.71 = $^{71}/_{100}$)<br>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents | associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^{3}/_{8}$) |
| | recognise and write decimal equivalents to $^{1}/_{4}$; $^{1}/_{2}$; $^{3}/_{4}$ | recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100 as a decimal fraction | recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. |
| **Addition and Subtraction of fractions** | | | |
| add and subtract fractions with the same denominator within one whole (e.g. $^{5}/_{7} + ^{1}/_{7} = ^{6}/_{7}$) | add and subtract fractions with the same denominator | add and subtract fractions with the same denominator and multiples of the same number<br>recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $^{2}/_{5} + ^{4}/_{5} = ^{6}/_{5}$ | add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions |
| **Multiplication and division of fractions** | | | |
| | | multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams | multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $^{1}/_{4} \times ^{1}/_{2} = ^{1}/_{8}$)<br>multiply one-digit numbers with up to two decimal places by whole numbers |
| | | | divide proper fractions by whole numbers (e.g. $^{1}/_{3} \div 2 = ^{1}/_{6}$) |
| **Multiplication and division of decimals** | | | |
| | | | multiply one-digit numbers with up to two decimal places by whole numbers |
| | 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 | | multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places |

| | | | |
|---|---|---|---|
| | | | identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places |
| | | | associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^{3}/_{8}$) |
| | | | use written division methods in cases where the answer has up to two decimal places |
| **Problem Solving** | | | |
| solve problems that involve all of the above | solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number | solve problems involving numbers up to three decimal places | |
| | solve simple measure and money problems involving fractions and decimals to two decimal places. | solve problems which require knowing percentage and decimal equivalents of $^{1}/_{2}$, $^{1}/_{4}$, $^{1}/_{5}$, $^{2}/_{5}$, $^{4}/_{5}$ and those with a denominator of a multiple of 10 or 25. | |
| **Greater depth** | **Greater depth** | **Greater depth** | **Greater depth** |
| Can find fractional values (from ½ to 1/10) of amounts up to 1000. | Relate tenths and hundredths to fractional values.<br>Work out simple percentage values of whole numbers.<br>Compare and add fractions whose denominators are all multiples of the same number. | | Compare, order and convert between fractions, decimals and percentages in contexts. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Sixths, sevenths, eighths, tenths. | Hundredths, decimal, decimal fractions, decimal point, decimal place, decimal equivalent, proportion. | Proper/improper fraction, equivalent, reduced to, cancel, thousandths, in every, for every, percentage, per cent. | Ratio. |

# Ratio and Proportion

| KEY SKILLS<br>Statements only appear in Year 6 but should be connected to previous learning, particularly fractions and multiplication and division | | | |
|---|---|---|---|
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| | | | solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts |
| | | | solve problems involving the calculation of percentages [for example,  of measures, and such as 15% of 360] and the use of percentages for comparison |
| | | | solve problems involving similar shapes where the scale factor is known or can be found |
| | | | solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. |
| **Greater depth** | **Greater depth** | **Greater depth** | **Greater depth** |
| | | | Reason with numbers showing an understanding of ratio and proportion. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| | | | Integer, percentages, scale factor, unequal grouping. |

# Measurement

| KEY SKILLS | | |
|---|---|---|
| **Reception** | **Year 1** | **Year 2** |
| **Comparing and estimating** | | |
| Orders two or three items by length or height.<br>Orders two items by weight or capacity.<br>Everyday language to talk about:<br>*size [e.g. long/short, longer/shorter, tall/short]<br>* weight [e.g. heavy/light, heavier than, lighter than]<br>*capacity [e.g. full/empty, more than, less than, half, half full, quarter]<br>* position [e. g. behind, next to]<br>*distance<br>*time [e.g. quicker, slower, earlier, later]<br>*money | compare, describe and solve practical problems for:<br>* lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half]<br>* mass/weight [e.g. heavy/light, heavier than, lighter than]<br>* capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter]<br>time [e.g. quicker, slower, earlier, later] | compare and order lengths, mass, volume/capacity and record the results using >, < and = |
| Orders and sequences familiar events. | sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] | compare and sequence intervals of time |
| **Measuring and calculating** | | |
| Measures short periods of time in simple ways. | measure and begin to record the following:<br>* **lengths and heights**<br>* **mass/weight**<br>* **capacity and volume**<br>* **time** (hours, minutes, seconds**)** | choose and use appropriate standard units to estimate and measure **length/height** in any direction (m/cm); **mass** (kg/g); **temperature** (°C); **capacity** (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels |
| Everyday language to talk about:<br>*money | recognise and know the value of different denominations of **coins and notes** | recognise and use symbols for pounds **(£) and pence (p)**; combine amounts to make a particular value |
| | | find different combinations of coins 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 |
| **Telling the time** | | |
| Everyday language to talk about:<br>*time [e.g. quicker, slower, earlier, later] | tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. | tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times. |

| | | |
|---|---|---|
| | recognise and use language relating to dates, including days of the week, weeks, months and years | know the number of minutes in an hour and the number of hours in a day. (appears also in Converting) |
| **Converting** | | |
| | | know the number of minutes in an hour and the number of hours in a day.<br>(appears also in Telling the Time) |
| **Greater depth** | **Greater depth** | **Greater depth** |
| Estimate, measure, weigh and compare and order objects.<br>Talk about properties, position and time. | Recognise all coins and notes, and know their value.<br>Use coins to pay for items bought up to £1.<br>Use knowledge of time to know when key periods of the day happen, for example, lunchtime, home time etc. | Read scales where not all numbers on the scale are given, and estimate points in between.<br>Read the time on a clock to the nearest 5 minutes. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Measure, size, compare, guess, estimate, enough, too much, too little, too many, too few, nearly, close to, about the same as.<br>Length, height, long, short, tall, wide, narrow, thick, thin, longer, shorter, taller… longest, shortest, tallest, highest…<br>Weigh, weighs, balances, heavy, light, heavier than, lighter then, scales, non-standard units.<br>Full empty, half full, holds, container.<br>Time, days of the week, Monday, Tuesday….day, week, birthday, morning, afternoon, evening, night, bedtime, dinner time, playtime, today, yesterday, tomorrow, before, after, next, last, quick, quicker, quickest, quickly, slow, slower, slowest, slowly, old, new, hour, o'clock, watch, clock, hands.<br>Money, coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay. | Measurement, roughly, centimetre, metre, standard units, wide, narrow, ruler, metre stick, kilogram, litre, capacity, volume, more than, less than, quarter full.<br>Months of the year, January, February…, seasons, Autumn, Winter, Spring, Summer, weekend, month, year, earlier, later, first, midnight, date, always, never, often, sometimes, usually, once, twice, half past, clock face, hour hand, minute hand, hours, minutes. | Measuring scales, further, furthest, tape measure, gram, millimetre, temperature, degree, 5, 10, 15 minutes past/ to, fortnight, quarter past, digital, analogue, timer, seconds, bought, sold. |

# Measurement

| KEY SKILLS | | | |
|---|---|---|---|
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Comparing and estimating** | | | |
| | estimate, compare and calculate different measures, including money in pounds and pence<br>(also included in Measuring) | calculate and compare the area of squares and rectangles including using standard units, square centimetres ($cm^2$) and square metres ($m^2$) and estimate the area of irregular shapes (also included in measuring) | 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 $km^3$. |
| | | estimate volume (e.g. using 1 $cm^3$ blocks to build cubes and cuboids) and capacity (e.g. using water) | |
| compare durations of events, for example to calculate the time taken by particular events or tasks | | | |
| estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight<br>(appears also in Telling the Time) | | | |
| **Measuring and calculating** | | | |
| measure, compare, add and subtract: **lengths** (m/cm/mm); **mass** (kg/g); **volume/capacity** (l/ml) | estimate, compare and calculate **different measures,** including **money in pounds and pence**<br>(appears also in Comparing) | use all four operations to solve problems involving measure (e.g. **length, mass, volume, money**) using decimal notation including scaling. | solve problems involving the calculation and conversion of **units of measure**, using decimal notation up to three decimal places where appropriate<br>(appears also in Converting) |
| measure the **perimeter** of simple 2-D shapes | measure and calculate the **perimeter** of a rectilinear figure (including squares) in centimetres and metres | measure and calculate the **perimeter** of composite rectilinear shapes in centimetres and metres | recognise that shapes with the same areas can have different **perimeters** and vice versa |

| | | | |
|---|---|---|---|
| add and subtract amounts of **money** to give change, using both £ and p in practical contexts | | | |
| | find the area of rectilinear shapes by counting squares | calculate and compare the area of squares and rectangles including using standard units, square centimetres ($cm^2$) and square metres ($m^2$) and estimate the area of irregular shapes<br><br>*recognise and use square numbers and cube numbers, and the notation for squared ($^2$) and cubed ($^3$)*<br>(copied from Multiplication and Division) | calculate the area of parallelograms and triangles<br>calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres ($cm^3$) and cubic metres ($m^3$), and extending to other units [e.g. $mm^3$ and $km^3$].<br>recognise when it is possible to use formulae for area and volume of shapes |
| **Telling the time** | | | |
| tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks | read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) | | |
| estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Comparing and Estimating) | | | |
| | solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting) | solve problems involving converting between units of time | |
| **Converting** | | | |
| know the number of seconds in a minute and the number of days in each month, year and leap year | convert between different units of measure (e.g. kilometre to metre; hour to minute) | convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) | use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places |

| | | | |
|---|---|---|---|
| | read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) | solve problems involving converting between units of time | solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating) |
| | solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time) | understand and use equivalences between metric units and common imperial units such as inches, pounds and pints | convert between miles and kilometres |
| **Greater depth** | **Greater depth** | **Greater depth** | **Greater depth** |
| Use knowledge of number to solve problems related to money, time and measures.<br>Can relate knowledge of time to problems related to timetables.<br>Measure, compare, add and subtract more complex problems using common metric measures set out in kg, g, kl, l, m, km. | Use a 24 hour timetable to find out times for a journey between various places.<br>Use knowledge of perimeter to work out the perimeter of large areas around school using metres and centimetres. | Use knowledge of measurement to create plans of areas around school, such as classroom, filed, play area etc.<br>Relate imperial measures still used regularly in our society to their metric equivalent, e.g. miles to kilometres, pounds to kilograms.<br>Use a range of timetables to work out journey times on a fictional journey around the world, e.g. how long would it take to reach the rainforests in the Amazon. | Use formula for measuring the area of shape such as cuboid and triangle to work out the area of an irregular shape in the school environment.<br>Use four operations with mass, length, time, money and other measures, including with decimal quantities.<br>Calculate costs and time involved to visit a destination in another part of the world. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Division, approximately, millimetre, kilometre, mile, distance apart, between, to, from, perimeter, centigrade, century, calendar, earliest, latest, a.m, p.m, roman numerals, 12 hour clock time, 24 hour clock time. | Unit, standard unit, metric unit, breadth, edge, area, covers, square centimetre, mass, measuring cylinder, leap year, millennium, date of birth, timetable, arrive, depart. | Imperial unit, square metre, square millimetre, pint, gallon, discount, currency. | Yard, foot, feet, inch, inches, circumference, tonne, pound, ounce, centilitre, cubic centimetres, cubic metres, cubic millimetres, cubic kilometres, Greenwich Mean Time, British Summer Time, International Date Line, profit, loss. |

# Geometry: Properties of Shapes

| KEY SKILLS | | |
|---|---|---|
| **Reception** | **Year 1** | **Year 2** |
| **Identifying shapes and their properties** | | |
| Uses familiar objects and common shapes to create and recreate patterns and build models.<br>Selects a particular named shape.<br>Explore characteristics of everyday objects and shapes, and use mathematical language to describe them.<br>Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes. | recognise and name common 2-D and 3-D shapes, including:<br>* 2-D shapes [e.g. rectangles (including squares), circles and triangles]<br>* 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres]. | identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line<br>identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces<br>identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] |
| **Comparing and classifying** | | |
| | | compare and sort common 2-D and 3-D shapes and everyday objects |
| **Greater depth** | **Greater depth** | **Greater depth** |
| Recognise and name a range of 2D and 3D shapes. | Recognise different 2D and 3D shapes in the environment. | Describe similarities and differences of 2D and 3D shapes using their properties. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Shape, pattern, flat, curved, straight, round, solid, sort, make, build, draw, size, bigger, larger, smaller, symmetrical, pattern, repeating pattern, match, 2D shape, corner, side, rectangle, square, circle, triangle, 3D shape, face, edge, corner, cube, pyramid, sphere, cone. | Point, pointed, cuboid, cylinder. | Surface, line symmetry, rectangular, circular, triangular, pentagon, hexagon, octagon. |

# Geometry: Properties of Shapes

| KEY SKILLS | | | |
|---|---|---|---|
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Identifying shapes and their properties** | | | |
| | identify lines of symmetry in 2-D shapes presented in different orientations | identify 3-D shapes, including cubes and other cuboids, from 2-D representations | recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing) |
| | | | illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius |
| **Drawing and constructing** | | | |
| draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them | complete a simple symmetric figure with respect to a specific line of symmetry | draw given angles, and measure them in degrees ($^{o}$) | draw 2-D shapes using given dimensions and angles |
| | | | recognise, describe and build simple 3-D shapes, including making nets |
| **Comparing and classifying** | | | |
| | compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes | use the properties of rectangles to deduce related facts and find missing lengths and angles | compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons |
| | | distinguish between regular and irregular polygons based on reasoning about equal sides and angles | |
| **Angles** | | | |
| recognise angles as a property of shape or a description of a turn | | know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles | |
| identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle | identify acute and obtuse angles and compare and order angles up to two right angles by size | Identify angles at a point and one whole turn (total 360$^{o}$)<br>Identify angles at a point on a straight line and ½ a turn (total 180$^{o}$)<br>Identify other multiples of 90$^{o}$ | recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles |
| identify horizontal and vertical lines and pairs of perpendicular and parallel lines | | | |

| Greater depth | Greater depth | Greater depth | Greater depth |
|---|---|---|---|
| | Know that the total internal angles of a triangle measure 180° and can measure each. | Recognise nets and show an understanding that they create 3D shapes.<br>Solve problems involving angles. | |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Draw, perimeter, pentagonal, hexagonal, octagonal, quadrilateral, right angled, parallel, perpendicular, hemisphere, prism, triangular prism, orientations. | Line, construct, sketch, centre, angle, right angles, base, square based, reflect, reflection, regular, irregular, two dimensional, oblong, rectilinear, equilateral triangle, isosceles triangle, scalene triangle, heptagon, parallelogram, rhombus, trapezium, polygon, three dimensional, spherical, cylindrical, tetrahedron, polyhedron. | Radius, diameter, congruent, axis of symmetry, reflective symmetry, x-axis, y-axis, quadrant, octahedron. | Circumference, concentric, arc, net, open, closed, intersecting, intersection, plane, kite, dodecahedron. |

# Geometry: Position and Direction

| KEY SKILLS | | |
|---|---|---|
| **Reception** | **Year 1** | **Year 2** |
| **Position, direction and movement** | | |
| Everyday language to talk about:<br>* position [e. g. behind, next to] | describe position, direction and movement, including half, quarter and three-quarter turns. | use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and<br>anti-clockwise) |
| **Pattern** | | |
| Recognise, create and describe patterns. | | order and arrange combinations of mathematical objects in patterns and sequences |
| **Greater depth** | **Greater depth** | **Greater depth** |
| | Give instructions using positional and directional language. | |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Position, over, under, above, below, top, bottom, on, in, outside, inside, around, in front of, behind, front, back, beside, next to, between, pattern, repeated pattern. | Underneath, centre, left, right, whole turn, half turn, quarter turn, three quarter turn. | Route, higher, lower, clockwise, anticlockwise, right angle, straight line. |

# Geometry: Position and Direction

| KEY SKILLS | | | |
|---|---|---|---|
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Position, direction and movement** | | | |
| recognise angles as a property of shape or a description of a turn | describe positions on a 2-D grid as coordinates in the first quadrant | identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed | describe positions on the full coordinate grid (all four quadrants) |
| | describe movements between positions as translations of a given unit to the left/right and up/down | | draw and translate simple shapes on the coordinate plane, and reflect them in the axes. |
| recognise angles as a property of shape or a description of a turn | plot specified points and draw sides to complete a given polygon | | |
| **Greater depth** | **Greater depth** | **Greater depth** | **Greater depth** |
| | | | |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Compass point, north, south, east, west, N, S, E, W, horizontal, vertical, diagonal, angle, greater/smaller angle than…, acute angle, obtuse angle. | North east, north west, south east, south west, NE, NW, SE, SW, translate, translation, rotate, rotation, degree, reflection, ruler, set square, angle measurer, compass. | Coordinate, protractor. | Reflex angle. |

# Statistics

| KEY SKILLS | | |
|---|---|---|
| **Reception** | **Year 1** | **Year 2** |
| **Handling data** | | |
| | | interpret and construct 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 and comparing categorical data |
| **Greater depth** | **Greater depth** | **Greater depth** |
| | | |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| | | Count, tally, sort, vote, graph, block graph, pictogram, represent, group, set, list, table, label, title, most/least popular, most/least common. |

# Statistics

| KEY SKILLS | | | |
|---|---|---|---|
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Counting** | | | |
| interpret and present data using bar charts, pictograms and tables | interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs | complete, read and interpret information in tables, including timetables | interpret and construct pie charts and line graphs and use these to solve problems |
| **Solving Problems** | | | |
| solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables. | solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. | solve comparison, sum and difference problems using information presented in a line graph | calculate and interpret the mean as an average |
| **Greater depth** | **Greater depth** | **Greater depth** | **Greater depth** |
| | Collect own data on a given project and present information in graphical formats of their choosing. | Collect own data on a given project and present information in graphical formats of their choosing, charts, graphs and tables. | Collect own data on a personal project and present information in formats of their choosing, charts, graphs and tables, and answer specific questions related to their research. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Chart, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axes, diagram. | Survey, questionnaire, data | Database, bar line chart, line graph, maximum/minimum value, outcome. | Pie chart, mean, mode, median, range, estimates, statistics, distribution. |

# Algebra

| KEY SKILLS | | |
|---|---|---|
| **Reception** | **Year 1** | **Year 2** |
| **Equations** | | |
| | solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and **missing number problems** such as 7 = □ - 9 (copied from Addition and Subtraction) | recognise and use the inverse relationship between addition and subtraction and use this to check calculations and **missing number** problems.<br>(copied from Addition and Subtraction) |
| | | recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100<br>(copied from Addition and Subtraction) |
| | represent and use number bonds and related subtraction facts within 20 (copied from Addition and Subtraction) | |
| **Greater depth** | **Greater depth** | **Greater depth** |
| | | |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| | Number bonds, facts, addition, subtraction, missing number problems. | Inverse, check, fluently. |

# Algebra

| KEY SKILLS | | | |
|---|---|---|---|
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Equations** | | | |
| solve problems, including **missing number** problems, using number facts, place value, and more complex addition and subtraction. (copied from Addition and Subtraction) | | use the properties of rectangles to deduce related facts and find **missing lengths and angles** (copied from Geometry: Properties of Shapes) | express missing number problems algebraically |
| solve problems, including **missing number** problems, involving multiplication and division, including integer scaling (copied from Multiplication and Division) | | | |
| | | | find pairs of numbers that satisfy number sentences involving two unknowns |
| | | | enumerate all possibilities of combinations of two variables |
| **Formulae** | | | |
| | Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit. (Copied from NSG measurement) | | use simple formulae |
| | | | *recognise when it is possible to use **formulae** for area and volume of shapes* (copied from Measurement) |
| **Sequences** | | | |
| | | | generate and describe linear number sequences |

| Greater depth | Greater depth | Greater depth | Greater depth |
|---|---|---|---|
| | | Calculate number problems algebraically for example 2x-3=5. | Recognise an arithmetic progression and find the nth term.<br>Move beyond squared and cubed numbers to calculate problems such as X x 10n where n is positive. |
| **Key vocabulary** | **Key vocabulary** | **Key vocabulary** | **Key vocabulary** |
| Missing number, complex, integer scaling, facts, complex. | Dimensions, perimeter, algebraic. | Missing lengths, missing angles. | Formulae, equation, unknown, variable. |

# Appendix 1: Key Stage 1 Medium Term Plans for Year 1 and 2

<table>
<tr><th></th><th colspan="2">Year 1/2 Medium Term Plan</th></tr>
<tr><td>Autumn Term 1</td><td><u>Number and Place Value</u><br><br>- Count, read and write numbers from 1 to 20 in numerals (in words)<br>- Read and write numbers to at least 100 in numerals and words<br>- Count to and across one hundred, forwards and backwards from any given number<br>- Given a number, identify one more and one less<br>- Recognise the place value of each digit in a two-digit number<br>- Use place value and number facts to solve problems<br><br>- Identify and represent numbers using objects and pictorial representations.<br>- Identify, represent and estimate numbers using different representations, including the number line</td><td><u>Addition and Subtraction</u><br><br>- Read, write and interpret mathematical statements involving + - and = signs.<br>- Add and subtract numbers, including;<br>> a two-digit number and ones<br>> a two-digit number and tens<br>> adding three one-digit numbers<br><br>- Represent and use number bonds and related subtraction facts within 20.<br>- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</td></tr>
<tr><td>Autumn Term 2</td><td><u>Number and Place Value</u><br>- Count, read and write numbers to 100 in numerals, count in multiples of 2s, 5s and 10s.<br>- Count in steps of 2, 3 and 5 from 0 and in 10s from any number, forward and backward<br><br>- Identify and represent numbers using objects and pictorial representations, including the number line and use the language of equal to, more than, less than (fewer), most and least.<br>- Identify, represent and estimate numbers using different representations, including the number line<br>- Compare and order numbers from 0 up to 100, use < > and = signs<br><br><u>Addition and Subtraction</u><br>- Read, write and interpret mathematical statements involving + - and = signs.<br>- Add and subtract one digit and two digit numbers to 20, including 0.<br>- Add and subtract numbers, including;<br>> a two-digit number and ones<br>> a two-digit number and tens<br>> adding three one-digit numbers</td><td><u>Multiplication and Division</u><br>- Solve one step problems involving multiplication and division by calculating the answer using concreate objects and pictorial representations<br>- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers<br><br><u>Measurement</u><br>- Compare, describe and solve practical problems for;<br>> length and height<br>> mass and weight<br>> capacity and volume<br>- Measure and begin to record the following;<br>> length and height<br>> mass and weight<br>> capacity and volume<br>- Choose and use appropriate standard units to estimate and measure length/height; mass; temperature; capacity to the nearest appropriate unit<br>- Compare and order lengths, mass, volume/capacity and record the results using > < and =<br><br><u>Measurement - Money</u><br>- Recognise and know the value of different denominations of coins and notes<br>- Recognise and use symbols for pounds and pence; combine amounts to make a particular value<br>- Find different combinations of coins that equal the same amounts of money<br>- Solve simple problems of addition and subtraction involving money, including giving change</td></tr>
</table>

| | | |
|---|---|---|
| **Spring Term 1** | **Addition and Subtraction**<br>- Add and subtract numbers, including;<br>> two two-digit numbers<br>- Show that addition of two numbers can be done in any order and subtraction of one number from another cannot<br>- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems | **Geometry/shape**<br>- Recognise and name common 2D and 3D shape.<br>- Identify and describe the properties of 3D shapes including the number of edges, vertices and faces<br>- Identify 2D shapes on the surface of 3D shapes<br>- Compare and sort common 2D and 3D shapes and everyday objects<br><br>**Measurement**<br>*- Recognise and use language related to dates, including days of the week, weeks, months and years*<br>*- Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times*<br>- Sequence events in chronological order<br>- Compare, describe and solve practical problems for time<br>- Measure and begin to record time<br>- Compare and sequence intervals of time<br>- Tell and write the time to five minutes, including quarter past/to the hour<br>- Know the number of minutes in an hour and hours in a day |
| **Spring Term 2** | **Multiplication and Division**<br>- Solve one step problems involving multiplication and division by calculating the answer using concreate objects and pictorial representations, and arrays with the support of the teacher<br>- Show that multiplication of two numbers can be done in any order and division of one number by another cannot<br>- solve problems involving multiplication and division<br>- Calculate mathematical statements for multiplication and division within he multiplication tables and write them using the x ÷ and = signs | **Statistics**<br>- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables<br>- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity<br>- Ask and answer simple questions about totalling and comparing categorical data<br><br>**Fractions**<br>- Recognise, find and name half as one of two equal parts of an object, shape or quantity<br>- Recognise, find and name quarter as one of four equal parts of an object, shape or quantity<br>- Recognise, find, name and write fractions 1/3 ¼ 2/4 and ¾ of a length, shape, set of objects or quantity<br>- Write simple fractions and recognise the equivalence of 2/4 and ½ |
| **Summer Term** | **Geometry**<br>- Describe position, direction and movement, including whole, half, quarter and three quarter turns<br>- Order and arrange combinations of mathematical objects and patterns and sequences<br>- Use mathematical vocabulary to describe position, direction and movement | **Measurement**<br>- Compare, describe and solve practical problems for;<br>> length and height<br>> mass and weight<br>> capacity and volume<br>- Measure and begin to record the following;<br>> length and height<br>> mass and weight<br>> capacity and volume<br>- Choose and use appropriate standard units to estimate and measure length/height; mass; temperature; capacity to the nearest appropriate unit |

# Appendix 2: Key Stage 2 Medium Term Plans for Years 3-6

| Year 3 | Autumn 1 | | Allow reasoning opportunities for… |
|---|---|---|---|
| | **Place Value**<br><br>Count from 0 in multiples of 4, 8, 50 and 100<br>Compare and order numbers up to 1000<br>Read and write numbers to 1000 in numerals and words<br>Find 10 or 100 more or less than any given number<br>Recognise the place value of each digit in a 3 digit number (H,T,U)<br>Solve number problems and practical problems involving the above | **Addition and Subtraction**<br><br>Add and subtract numbers mentally (3 digit and 1's, 3 digit and 10's, 3 digit and 100's)<br>Add numbers with up to 3 digits using formal written methods<br>Subtract numbers with up to 3 digits using formal written methods<br>Estimate and use inverse operations<br><br>Solve addition and subtraction 2 step problems in contexts (choose methods and explain why) | Recall of key facts<br><br>Mental calculations |
| **Year 3** | **Autumn 2** | | **Allow reasoning opportunities for…** |
| | **Number Properties**<br><br>Recall and use multiplication and division facts for the 3, 4 and 8 times tables<br>Write and calculate mathematical statements for multiplication and division using times tables that they know (including 2 digit x 1 digit) | **Multiplication and Division**<br><br>Begin to use formal methods of multiplication and division (based on tables knowledge)<br><br>Solve problems involving multiplication and division in context (including missing number problems) | Recognise the place value of each digit in a 3 digit number (H,T,U)<br><br>Add and subtract numbers mentally<br>(3 digit and 1's, 3 digit and 10's, 3 digit and 100's)<br><br>Solve addition and subtraction 2 step problems in contexts (choose methods and explain why) |

| Year 3 | Spring 1 | | Allow reasoning opportunities for… |
|---|---|---|---|
| | **Properties of fractions and decimals**<br><br>Count up and down in tenths<br>Recognise tenths arise from dividing a number/object into 10 equal parts<br>Recognise, find and write fractions of a set of objects<br>Recognise and use fractions as numbers<br>Recognise, and show with diagrams, equivalent fractions with small denominators<br>Compare and order fractions with the same denominators<br>Add and subtract fractions with same denominator within one whole (5/7 + 1/7 = 6/7)<br><br>Solve problems that involve the above | **Time**<br><br>Tell and write the time from: analogue clocks (including R.N)<br>12 hour clocks<br>24 clocks<br>Estimate and read time to the nearest minute<br>Use vocabulary such as O'clock/a.m/p.m, morning, afternoon, noon and midnight<br>Know the number of seconds in a minute<br>Number of days in each month, year and leap year<br>Compare how long 2 things have taken | Estimate and use inverse operations<br><br>Solve addition and subtraction 2 step problems in contexts (choose methods and explain why)<br>Solve problems involving multiplication and division in context (including missing number problems) |
| **Year 3** | **Spring 2** | | **Allow reasoning opportunities for…** |
| | **Properties of Shape**<br><br>Identify horizontal, vertical lines and pairs of perpendicular and parallel lines<br>Draw 2D shapes<br>Make 3D shapes using modelling materials<br>Recognise 3D shapes and describe them | **Angles**<br><br>Recognise that angles are a property of a shape or a description of a turn<br>Identify right angles<br>Recognise 2 right angles make a half turn, three make 3 quarters and four a complete turn<br>Identify whether angles are greater than or less than a right angle | Estimate and use inverse operations<br><br>Solve addition and subtraction 2 step problems in contexts (choose methods and explain why)<br>Solve problems involving multiplication and division in context (including missing number problems)<br><br>Solving problems with fractions<br><br>Tell and write the time from: analogue clocks |

| Year 3 | Summer 1 | | Allow reasoning opportunities for… |
|---|---|---|---|
| | **Data Handling**<br><br>Interpret and present data using bar charts, pictograms and tables<br>Solve one and two step problems using info from bar charts, pictograms and tables (How many more? How many fewer?) | **Money**<br><br>Add and subtract amounts of money to give change (£ and p in practical contexts) | Estimate and use inverse operations<br><br>Solve addition and subtraction 2 step problems in contexts (choose methods and explain why)<br>Solve problems involving multiplication and division in context (including missing number problems)<br><br>Solving problems with fractions<br><br>Tell and write the time from: analogue clocks |
| **Year 3** | **Summer 2** | | **Allow reasoning opportunities for…** |
| | **Solving problems with measures**<br><br>Compare lengths (m/cm/mm)<br>Compare mass (kg/g)<br>Compare volume (l/ml)<br>Measure lengths (m/cm/mm)<br>Measure mass (kg/g)<br>Measure volume (l/ml)<br>Add and subtract lengths, mass and capacity<br>Measure perimeters of simple 2D shapes | | Estimate and use inverse operations<br><br>Solve addition and subtraction 2 step problems in contexts (choose methods and explain why)<br>Solve problems involving multiplication and division in context (including missing number problems)<br><br>Solving problems with fractions<br><br>Tell and write the time from: analogue clocks<br><br>Add and subtract amounts of money to give change (£ and p in practical contexts) |

| Year 4 | Autumn 1 | | | Allow reasoning opportunities for… |
|---|---|---|---|---|
| | **Place Value**<br><br>Count in multiples of 6, 7, 9, 25 and 1000<br>Order and compare numbers beyond 1000<br>Find 1000 more or less than a given number<br>Recognise the value of each digit in a 4 digit number (Th, H, T, U)<br>Read Roman Numerals to 100<br>Round any number to the nearest 10, 100, 1000<br>Count backwards through 0 to include negative numbers<br><br>Solve number and practical problems involving the above with increasingly large numbers | **Addition and Subtraction**<br><br>Add and subtract numbers with up to 4 digits using formal written methods<br>Estimate and use inverse operations to check answers to a calculation<br><br>Solve addition and subtraction 2 step problems in context (choose methods, explain why) | **Perimeter**<br><br>Measure and calculate the perimeter of a rectilinear shape (including squares) in cm and m | Solve number and practical problems involving the place value with increasingly large numbers<br>Solve addition and subtraction 2 step problems in context (choose methods, explain why) |
| **Year 4** | **Autumn 2** | | | **Allow reasoning opportunities for…** |
| | **Number Properties**<br><br>Recall multiplication and division facts for tables up to 12 x 12<br>Use place value , known and derived facts to multiply and divide mentally (including x by 0 and 1; / by 1; multiply 3 numbers)<br>Recognise and use factor pairs and commutative in mental calculations | **Multiplication and Division**<br><br>Multiply 2 digit and 3 digit numbers by a 1 digit number using formal written method<br><br>Divide 2 digit numbers by 1 digit using tables knowledge and bus stop<br><br>Solve problems involving multiplication and division | **Area**<br><br>Find the area of rectilinear shapes by counting squares | Solve number and practical problems involving the place value with increasingly large numbers<br>Solve addition and subtraction 2 step problems in context (choose methods, explain why) |

| Year 4 | Spring 1 | | | Allow reasoning opportunities for… |
|---|---|---|---|---|
| | **Properties of fractions and decimals**<br><br>Count up and down in hundredths<br>Recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten<br>Round decimals with 1 d.p. to the nearest while number<br>Compare numbers with the same number of d.p. up to 2 d.p.<br>Recognise and show, using diagrams, families of common equivalent fractions (1/2, 2/4, 3/6, 4/8)<br>Find the effect of dividing a 1 or 2 digit number by 10 and 100 (identify value of digits in answer as ones, tenths, hundredths) | **Fractions**<br><br>Add and subtract fractions with the same denominator<br>Recognise and write decimal equivalents to ¼, ½, ¾<br>Recognise and write decimal equivalents of any number of tenths and hundredths<br><br>Solve problems involving calculating quantities and fractions to divide quantities<br>Solve simple measure and money problems involving fractions and decimals to 2d.p. | **Time**<br><br>Read, write and convert time between analogue and digital clocks (12 hour and 24 hour)<br>Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days | Solve number and practical problems involving the place value with increasingly large numbers<br>Solve addition and subtraction 2 step problems in context (choose methods, explain why)<br>Solve problems involving multiplication and division<br>Recall multiplication and division facts for tables up to 12 x 12 |
| **Year 4** | **Spring 2** | | | **Allow reasoning opportunities for…** |
| | **Properties of Shape**<br><br>Compare and classify geometric shapes (including quadrilaterals and triangles) based on their properties<br>Identify lines of symmetry in 2D shapes<br>Complete a simple symmetric figure across a line of symmetry | **Angles**<br><br>Identify acute, obtuse and reflex angles<br>Compare and order angles by size | **Co-ordinates**<br><br>Describe positions on a 2D grid as coordinates in the first quadrant<br>Plot specified points and draw sides to complete a given polygon | Solve number and practical problems involving the place value with increasingly large numbers<br>Solve addition and subtraction 2 step problems in context (choose methods, explain why)<br>Solve problems involving multiplication and division<br>Recall multiplication and division facts for tables up to 12 x 12<br>Solve problems involving calculating quantities and fractions to divide quantities<br>Solve simple measure and money problems involving fractions and decimals to 2d.p. |

| Year 4 | Summer 1 | | | Allow reasoning opportunities for… |
|---|---|---|---|---|
| | **Data Handling**<br><br>Interpret and present discrete and continuous data using bar charts and time graphs<br>Sole problems using info presented in bar charts, pictograms, tables and other graphs (comparison, sum, difference etc) | **Transformations**<br><br>Describe movements between positions as translations of a given unit to the left/right and up/down | **Units of measure**<br><br>Convert between different units of measurement (km/m hour/min) | Solve number and practical problems involving the place value with increasingly large numbers<br>Solve addition and subtraction 2 step problems in context (choose methods, explain why)<br>Solve problems involving multiplication and division<br>Recall multiplication and division facts for tables up to 12 x 12<br>Solve problems involving calculating quantities and fractions to divide quantities<br>Solve simple measure and money problems involving fractions and decimals to 2d.p. |
| **Year 4** | **Summer 2** | | | **Allow reasoning opportunities for…** |
| | **Solving problems with measures**<br><br>Compare different measures, including money<br>Estimate different measures, including money | | | Solve number and practical problems involving the place value with increasingly large numbers<br>Solve addition and subtraction 2 step problems in context (choose methods, explain why)<br>Solve problems involving multiplication and division<br>Recall multiplication and division facts for tables up to 12 x 12<br>Solve problems involving calculating quantities and fractions to divide quantities<br>Solve simple measure and money problems involving fractions and decimals to 2d.p. |

| Year 5 | Autumn 1 | | | Allow reasoning opportunities for… |
|---|---|---|---|---|
| | **Place Value**<br><br>Count forward or backward in steps of 10 for any number (up to 1000000)<br>Know value of each digit up to 1,000,000<br>Read, write, order and compare numbers to at least 1,000,000<br>Rounding (10, 100, 1000, 10000, 100,000)<br>Negative number counting<br><br>(Solve practical number problems involving the above) | **Addition and Subtraction**<br><br>Commutativity<br>Add and subtract numbers mentally<br>Column addition (4+ digits)<br>Column subtraction (4+ digits)<br>Solve multi-step addition and subtraction problems (choose methods and explain why) | **Perimeter**<br><br>Measure and calculate perimeter of composite rectilinear shapes | Count forward or backward in steps of 10 for any number (up to 1000000)<br>Know value of each digit up to 1,000,000<br>Negative number counting<br>Solve multi-step addition and subtraction problems (choose methods and explain why) |
| **Year 5** | **Autumn 2** | | | **Allow reasoning opportunities for…** |
| | **Number Properties**<br><br>Prime numbers, prime factors and composite numbers<br>Square numbers and cube numbers (including notation)<br>Identify multiples and factors (Including common factors)<br>Multiply and divide by 10, 100, 1000 including decimals<br>Read Roman Numerals up to 1000 | **Multiplication and Division**<br><br>Multiply and divide numbers mentally drawing upon know facts<br>Multiply using a written method (Up to digits: 4 x 2)<br>Divide numbers using written method (Up to 4 digits / 1 digit)Solve problems involving multiplication and division (including simple scaling) | **Area**<br><br>Calculating and compare the area of rectangles (cm2, m2)<br>Estimate the area of irregular shapes<br>Estimate volume (1cm3 blocks) and capacity (water) | Count forward or backward in steps of 10 for any number (up to 1000000)<br>Negative number counting<br>Solve multi-step addition and subtraction problems (choose methods and explain why) |

| Year 5 | Spring 1 | | | Allow reasoning opportunities for… |
|---|---|---|---|---|
| | **Properties of fractions and decimals**<br><br>Recognise and use tenths, hundredths and thousandths<br>Round decimals with 2d.p. to nearest whole number/1 d.p.<br>Read, write, order and compare numbers with up to 3 d.p.<br>Read and write decimal numbers as fractions (0.71=71/100)<br>Identify and write equivalent fractions<br>Cancel fractions<br>Solve problems involving numbers up to 3 d.p. | **Fractions**<br><br>Add and subtract fractions with the same denominator and denominators that are multiples of the same number<br>Compare and order fractions (whose denominators are multiples of same number)<br>Multiply proper fractions and mixed numbers by whole numbers<br>Recognise mixed numbers and improper fractions and convert from one to the other<br>Find fractions of amounts | **Percentage**<br><br>Recognise the % symbol<br>Understand it relates to 'number of parts per 100'<br>Write % as a fraction and as a decimal<br>Solve problem which require knowing % and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and fractions with denominators of 10 or 25 | Count forward or backward in steps of 10 for any number (up to 1000000)<br>Negative number counting<br>Solve multi-step addition and subtraction problems (choose methods and explain why)<br>Multiply and divide by 10, 100, 1000 including decimals<br>Solve problems involving multiplication and division (including simple scaling) |
| **Year 5** | **Spring 2** | | | **Allow reasoning opportunities for…** |
| | **Properties of Shape**<br><br>Use properties of rectangles to identify missing length/angles<br>Identify regular and irregular polygons<br>Properties of 2D shapes<br>Properties of 3D shapes | **Angles**<br><br>Estimate and compare acute, obtuse and reflex angles in degrees<br>Draw given angles and measure in degrees<br>Angles in a triangle (180)<br>Angles on straight line (180)<br>Angles round a point (360) | | Count forward or backward in steps of 10 for any number (up to 1000000)<br>Negative number counting<br>Solve multi-step addition and subtraction problems (choose methods and explain why)<br>Multiply and divide by 10, 100, 1000 including decimals<br>Solve problems involving multiplication and division (including simple scaling)<br>Solve problems involving numbers up to 3 d.p.<br>Cancel fractions |

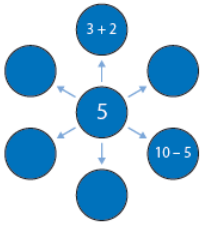
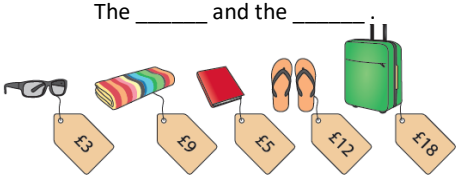
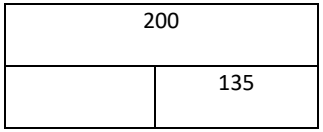
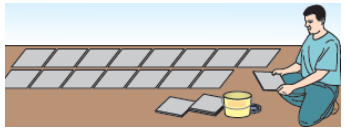
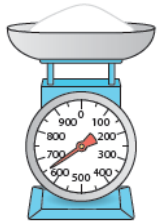
| Year 5 | Summer 1 | | | Allow reasoning opportunities for… |
|---|---|---|---|---|
| | **Data Handling**<br><br>Complete, read and interpret info from tables (including timetables)<br>Solve problems using information from a bar chart, pictogram or line graph | **Transformations**<br><br>Identify, describe and represent the position of a shape following a reflections or a translation<br><br>**Co-ordinates**<br><br>Identify and plot co-ordinates<br>Plot specified points to complete polygons | **Units of measure**<br><br>Convert between different metric units of measure<br>Understand and use approx. equivalences between metric and imperial (inches, pounds, pints) | Count forward or backward in steps of 10 for any number (up to 1000000)<br>Negative number counting<br>Solve multi-step addition and subtraction problems (choose methods and explain why)<br>Multiply and divide by 10, 100, 1000 including decimals<br>Solve problems involving multiplication and division (including simple scaling)<br>olve problems involving numbers up to 3 d.p.<br>Cancel fractions |
| **Year 5** | **Summer 2** | | | **Allow reasoning opportunities for…** |
| | **Solving problems with measures**<br><br>Use all four operations to solve problems involving money (including scaling)<br>Use all four operations to solve problems involving length (including scaling)<br>Use all four operations to solve problems involving mass (including scaling)<br>Use all four operations to solve problems involving volume (including scaling) | **Time**<br><br>Solve problems converting between units of time | **Sequences**<br><br>Recognise and describe number sequences (including fractions and decimals)<br>Identify term to term rule in the sequence | Count forward or backward in steps of 10 for any number (up to 1000000)<br>Negative number counting<br>Solve multi-step addition and subtraction problems (choose methods and explain why)<br>Multiply and divide by 10, 100, 1000 including decimals<br>Solve problems involving multiplication and division (including simple scaling)<br>olve problems involving numbers up to 3 d.p.<br>Cancel fractions<br>Use all four operations to solve problems involving measures (including scaling)<br>Recognise and describe number sequences (including fractions and decimals)<br>Identify term to term rule in the sequence |

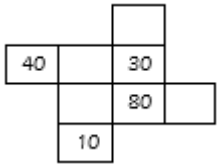
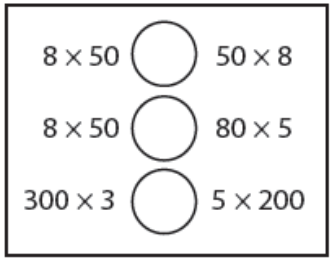
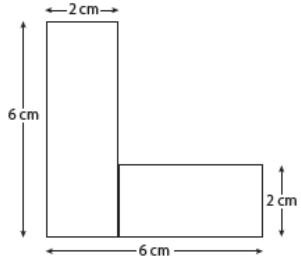
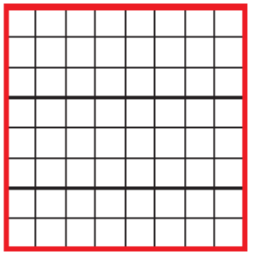
| Year 6 | Autumn 1 | | | Allow reasoning opportunities for… |
|---|---|---|---|---|
| | **Place Value**<br><br>Read, write, order and compare number up to 10,000,000<br>Determine the value of each digit in numbers up to 10,000,000<br>Round any whole number to required degree of accuracy<br>Use negative numbers in context, calculate across zero<br><br>Solve number and practical problems involving the above | **Addition and Subtraction**<br><br>Solve addition and subtraction multi-step problems in contexts (decide which operations/methods to use and why)<br><br>**Multiplication and Division**<br><br>Multiply numbers using formal written method (Up to 4 digit x 2 digit)<br>Divide numbers using formal written method (up to 4 digit by 2 digit) and interpret remainders as appropriate for context (whole, fraction, rounding) | **Algebra**<br><br>Express missing number problems algebraically<br>Use simple formulae<br>Generate and describe linear number sequences<br>Find pairs of numbers that satisfy an equation with 2 unknowns<br>Enumerate possibilities of combinations of 2 variables | Solve problems with the 4 operations |
| **Year 6** | **Autumn 2** | | | **Allow reasoning opportunities for…** |
| | **Number Properties**<br><br>Identify common factors, common multiples and prime numbers<br>Perform mental calculations, including with mixed operations and large numbers | **Multiplication and Division**<br><br>Multiply 1 digit numbers with up to 2 d.p. by whole numbers<br>Divide numbers using formal written method (up to 4 digit by 2 digit) and interpret remainders as appropriate for context (whole, fraction, rounding)<br>Use written division for answers with up to 2 d.p<br>Solve problems involving addition, subtraction, multiplication and division using knowledge of order of operations | **Area and Volume**<br><br>Recognise shapes with the same area can have different perimeters and vice versa<br>Calculate the area of parallelograms and triangles<br>Recognise when it is possible to use formulae for the area of shapes<br><br>Calculate, estimate and compare volume of cubes and cuboids (cm3/m3/km3)<br>Recognise when it is possible to use the formulae for the volume of shapes | Solve problems with the 4 operations<br>Find pairs of numbers that satisfy an equation with 2 unknowns<br>Enumerate possibilities of combinations of 2 variables |

| Year 6 | Spring 1 | | | Allow reasoning opportunities for… |
|---|---|---|---|---|
| | **Properties of fractions and decimals**<br><br>Use common factors to simplify equivalent fractions<br>Use common multiples to express fractions in the same denomination<br>Compare and order fractions (including fractions >1)<br>Identify the value of each digit to 3 d.p.<br>Multiply and divide by 10, 100, 1000 giving answer to 3 d.p. | **Fractions and Percentage**<br><br>Add and subtract fractions with different denominators and mixed numbers (using concept of equivalent fractions)<br>Multiply simple pairs of proper fractions writing answer in simplest form (1/4 x ½ = 1/8)<br>Divide proper fractions by whole numbers (1/3 / 2 = 6)<br>Associate a fraction with division to calculate decimal fraction equivalents (0.375 = 3/8)<br>Recall and use equivalences between simple fractions, decimals and percentages (including in different contexts) | **Ratio and Proportion**<br><br>Solve problems involving the relative size of 2 quantities (missing values found using x and / facts)<br>Solve problems involving the calculation of percentages<br>Solve problems involving similar shapes where scale factor is known or can be found<br>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples | Solve problems with the 4 operations<br>Find pairs of numbers that satisfy an equation with 2 unknowns<br>Enumerate possibilities of combinations of 2 variables |
| **Year 6** | **Spring 2** | | | **Allow reasoning opportunities for…** |
| | **Properties of Shape**<br>Compare and classify geometric shapes based on their properties and sizes<br>Describe simple 3D shapes<br>Draw 2D shapes given dimensions and angles<br>Recognise and build simple 3D shapes, including making nets<br>Name parts of circles, including radius, diameter and circumference<br>Know diameter is twice the radius<br><br>**Angles**<br>Find unknown angles in any triangles, quadrilaterals and regular polygons<br>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite and find missing angles | **Co-ordinates and transformations**<br><br>Draw and translate simple shapes on the coordinate plane, and reflect them in the axes<br>Describe positions on full coordinate grid (all 4 quadrants) | **Solving problems with measures**<br><br>Use read, write and convert between standard units (length, mass, volume and time)from smaller unit to larger and vice versa (up to 3d.p.)<br>Convert between miles and km<br><br>Solve problems involving the conversion of measure (up to 3d.p.)<br><br>**Data Handling**<br><br>Interpret and construct pie charts and line graphs and use these to solve problems<br>Calculate and interpret the mean as an average | Solve problems with the 4 operations<br>Find pairs of numbers that satisfy an equation with 2 unknowns<br>Enumerate possibilities of combinations of 2 variables<br>Compare and order fractions (including fractions >1)<br>Add and subtract fractions with different denominators and mixed numbers (using concept of equivalent fractions)<br>Multiply simple pairs of proper fractions writing answer in simplest form (1/4 x ½ = 1/8)<br>Divide proper fractions by whole numbers (1/3 / 2 = 6)<br>Solving problems with ratio and percentages |

| Year 6 | Summer 1 | | | Allow reasoning opportunities for… |
|---|---|---|---|---|
| | **Revision** | | | |
| **Year 6** | **Summer 2** | | | **Allow reasoning opportunities for…** |
| | **Enterprise Project** | | | |

# Appendix 3: Examples of deeper thinking style questions

| | Addition | Subtraction | Division | Multiplication | Measurement |
|---|---|---|---|---|---|
| Reception | 9+4=5<br>True or false? Can you show me/ explain how you know? | 10-4=14<br>True or false? Can you show me/ explain how you know? | I want to halve my sweets with my friend, will I have more or less sweets at the end? Why? | If I want to double 3, I add on another 2? Is this right? Explain | Look at various objects on the table:<br>Which object do you think would be the heaviest?<br>Which object do you think would be the lightest?<br>Why? Compare… |
| Year 1 |  <br>If you know one fact, what other facts do you know? | I'm thinking of a number. I've subtracted 5 and the answer is 7. What number was I thinking of? Explain how you know. | Captain Conjecture says, 'I can double any number, but I can only halve some numbers'.<br>Do you agree?<br>Explain your reasoning. | If I start on 0 and count on in fives will I say the number 55? | A long brick is twice the length of a short brick.<br>Which is longer:<br>2 long bricks or 3 short bricks?<br>3 long bricks or 5 short bricks?<br>  |
| Year 2 | Captain Conjecture says 'An odd number + an odd number = an even number'.<br>Is this sometimes, always or never true? | Can you find different possibilities?<br>□ + □ = 50<br>50 – □ = □ | 5 × 4 = 4 × 5<br>5 × 4 = 10 × 2<br>5 × 4 = 2 × 10 Explain your reasoning. What do you notice? | Two friends want to buy some marbles and then share them out equally between them. They could buy a bag of 13 marbles, a bag of 14 marbles or a bag of 19 marbles. What size bag should they buy so that they can share them equally?<br>What other numbers of marbles could be shared equally?<br>Explain your reasoning. | Sid says, 'I have bought 2 items for my holiday. One item cost £9 more than the other.'<br>What might Sid have bought?<br>The _____ and the _____ .<br>  |
| Year 3 | Are the following statements always, sometimes or never true?<br>Adding 5 to a number ending in 6 will sum to a number ending in 1.<br>Adding 8 to a number ending in 2 will always sum to a multiple of 10.<br>Explain why in each case. | Identify the missing number in these bar models.<br>  | The following problems can be solved by using the calculation 8 ÷ 2. True or false?<br><br>There are 2 bags of bread rolls that have 8 rolls in each bag. How many rolls are there altogether? | Roger has 60 slabs. Using all of the slabs find three different ways that he can arrange the slabs to form a rectangular patio.<br>  | I need 3/4 kg of flour to make a cake.<br>How much more flour do I need to add to the scales?<br>  |

| | Addition | Subtraction | Division | Multiplication | Measurement |
|---|---|---|---|---|---|
| Year 4 | Complete this diagram so that the three numbers in each row and column add up to 160.<br>  | Flo and Jim are answering a problem:<br>Danny has read 62 pages of the class book, Jack has read 43.<br>How many more pages has Danny read than Jack? | The following problems can be solved by using the calculation 8 ÷ 2. True or false?<br><br>There are 2 bags of bread rolls that have 8 rolls in each bag.<br>How many rolls are there altogether? | Place one of these symbols in the circle to make the number sentence correct:<br>>, < or =<br>  | The shape below is made from two rectangles. Identify the perimeter of each of the two rectangles. How many 1 cm squares would fit into the smaller rectangle? How many more squares fit into the larger rectangle?<br>  |
| Year 5 | Use this number sentence to write down three more pairs of decimal numbers that sum to 3.<br><br>1.6 + 1.4 = 3 | True or False?<br>3999 – 2999 = 4000 – 3000<br>3999 – 2999 = 3000 – 2000<br>2741 – 1263 = 2742 – 1264<br>2741 + 1263 = 2742 + 1264<br>Explain your reasoning. | A 1 m piece of ribbon is cut into equal pieces and a piece measuring 4 cm remains. What might the lengths of the equal parts be? In how many different ways can the ribbon be cut into equal pieces? | Captain Conjecture says: “Factors come in pairs so all numbers have an even number of factors.” Do you agree? Explain your reasoning. | <u>Deeper Learning</u><br>Here is a picture of a square drawn on cm2 paper.<br>How many other rectangles are there with the same perimeter as the square, where the sides are a whole number of cm? Show your workings.<br>  |
| Year 6 | Can you use five of the digits 1 to 9 to make this number sentence true?<br>__ __ .__ + __ . __ = 31.7<br>Can you find other sets of five of the digits 1 to 9 that make the sentence true? | Two numbers have a difference of 2·3. They are both less than 10.<br>What could the numbers be? | A box of labels costs £24.<br>There are 100 sheets in the box.<br>There are 10 labels on each sheet.<br>Calculate the cost of one label, in pence. | Which calculation is the odd one out?<br><br>753 x 1.8<br>(75.3 x 3) x 6<br>7.53 x 1800<br>753 x 2 – 753 x 0.2<br>750 x 1.8 + 3 x 1.8<br><br>Explain your reasoning. | Liping says, ‘If you draw two rectangles and the second one has a greater perimeter than the first one, then the second one will also have a greater area.’ Do you agree or disagree with her?<br>Explain your reasoning. |