Mill Lane Maths Progression Document 2020 Please note that statements in *italic* are non-statutory guidance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Number - number and place value** |
| **Counting** | PV1 Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number PV2 Count in multiples of twos, fives and tens | PV6 Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward | PV12 Count from 0 in multiples of 4, 8, 50 and 100F10 Count up and down in tenths | PV18 Count in multiples of 6, 7, 9, 25 and 1000PV20 Count backwards through zero to include negative numbersF16 Count up and down in hundredths | PV28 Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000*Count forwards and backwards in decimal steps* | *Count forwards or backwards in steps of integers, decimals or powers of 10 for any number* |
| **Place Value** | PV2 Read and write numbers to 100 in numeralsPV5 Read and write numbers from 1 to 20 in numerals and words | PV10 Read and write numbers to at least 100 in numerals and in words | PV16 Read and write numbers up to 1000 in numerals and in words*Read and write numbers with one decimal place* | *Read and write numbers to at least 10 000**Read and write numbers with up to two decimal places* | PV27 Read and write numbers to at least 1 000 000PV27 Read and write numbers with up to three decimal places | PV33 Read and write numbers up to 10 000 000 |
| *Begin to recognise the place value of numbers beyond 20 (tens and ones)* | PV7 Recognise the place value of each digit in a two-digit number (tens, ones) | PV13 Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) | PV21 Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) | PV27 Determine the value of each digit in numbers to at least1 000 000 | PV33 Determine the value of each digit in numbers up to10 000 000 |
|  |  | *Identify the value of each digit to one decimal place* | *Identify the value of each digit to two decimal places* | *Identify the value of each digit to three decimal places* | PV33 Identify the value of each digit to three decimal places |
|  | *Partition numbers in different ways (for example, 23 = 20 + 3 and 23 = 10 + 13)* | *Partition numbers in different ways (for example, 146 = 100 + 40 + 6 & 146 = 130 + 16)* | *Partition numbers in different ways (for example, 2.3 = 2 + 0.3 and 2.3 = 1 + 1.3)* |  |  |
| PV4 Identify and represent numbers using objects and pictorial representations including the number line | PV8 Identify, represent and estimate numbers using different representations, including the number line | PV15 Identify, represent and estimate numbers using different representations, *including the number line* | PV23 Identify, represent and estimate numbers using different representations, *including the number line* | *Identify, represent and estimate numbers using the number line* | *Identify, represent and estimate numbers using the number line* |
| **Comparing and ordering** | PV4 Use the language of: equal to, more than, less than (fewer), most, least | PV9 Compare and order numbers from 0 up to 100; use <, > and = signs | PV14 Compare and order numbers up to 1000 | PV22 Order and compare numbers beyond 1000 | PV27 Order and compare numbers to at least1 000 000 | PV33 Order and compare numbers up to 10 000 000 |
|  |  | *Compare and order numbers with one decimal place* | PV22 *Order and* compare numbers with the same number of decimal places up to two decimal places | PV27 Order and compare numbers with up to three decimal places | *Order and compare numbers including integers, decimals and negative numbers* |
| PV3 Given a number, identify one more and one less | *Find 1 or 10 more or less than a given number* | PV19 Find *1,* 10 or 100 more or less than a given number | PV22 Find *0.1, 1, 10, 100 or* 1000 more or less than a given number | *Find 0.01, 0.1, 1, 10, 100, 1000 and other* *powers of 10 more or less than a given number* | *Find 0.001, 0.01, 0.1, 1, 10 and powers of 10 more or less than a given number* |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Number - number and place value** |
| **Rounding, approximation and estimation** |  | *Round numbers to at least 100 to the nearest 10* | *Round numbers to at least 1000 to the nearest 10 or 100* | PV24 Round any number to the nearest 10, 100 or 1000 | PV30 Round any number up to1 000 000 to the nearest 10, 100, 1000, 10 000 and100 000 | PV34 Round any whole number to a required degree of accuracy |
|  |  |  | PV24 Round decimals with one decimal place to the nearest whole number | PV30 Round decimals with two decimal places to the nearest whole number and to one decimal place | *Round decimals with three decimal places to the nearest whole number or one or two decimal places* |
| **Multiplying by powers of 10** |  | *Understand the connection between the 10 multiplication table and place value* | *Find the effect of multiplying a one- or two-digit number by 10 and 100, identify the value of the digits in the answer* | 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 whole numbers and those involving decimals by 10, 100 and 1000 | Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places |
| **Negative numbers** |  |  |  | PV20 Count backwards through zero to include negative numbers *(see counting)* | PV29 Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero | PV35 Use negative numbers in context, and calculate intervals across zero |
| ***Sequences and patterns*** | *Recognise and create repeating patterns with numbers, objects and shapes**Identify odd and even numbers linked to counting in twos from 0 and 1* | *Describe and extend simple sequences involving counting on or back in different steps* | *Describe and extend number sequences involving counting on or back in different steps* | *Describe and extend number sequences involving counting on or back in different steps, including sequences with multiplication and division steps* | *Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal* | *Describe and extend number sequences including those with multiplication and division steps, inconsistent steps, alternating steps and those where the step size is a decimal* |
| **Roman numerals** |  |  | *Read Roman numerals from I to XII (see time)* | PV26 Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value | PV32 Read Roman numerals to 1000 (M) and recognise years written in Roman numerals |  |
| **Solving number problems** | *Solve problems and practical problems involving all of the above* | PV11 Use place value and number facts to solve problems | PV17 Solve number problems and practical problems involving these ideas | PV25 Solve number and practical problems that involve all of the above and with increasingly large positive numbers | PV31 Solve number problems and practical problems that involve all of the above | PV36 Solve number and practical problems that involve all of the above |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Number - addition and subtraction** |
| **Understanding addition and subtraction** |  | *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting)* | *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* | *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* | *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* | *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* |
| AS1 Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs | AS8 Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot*Understand subtraction as take away and difference (how many more, how many less/fewer)* | *Understand and use take away and difference for subtraction, deciding on the most efficient method for the numbers involved, irrespective of context* |  |  |  |
| **Addition and subtraction facts** | AS2 Represent and use number bonds and related subtraction facts within 20 | AS6 Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100*Recall and use number bonds for multiples of 5 totalling 60 (to support telling time to nearest 5 minutes)* | *Recall and use addition and subtraction facts for 100 (multiples of 5 and 10)**Derive and use addition and subtraction facts for 100**Derive and use addition and subtraction facts for multiples of 100 totalling 1000* | *Recall and use addition and subtraction facts for 100**Recall and use addition and subtraction facts for multiples of 100 totalling 1000**Derive and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place)* | *Recall and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place)**Derive and use addition and subtraction facts for 1 (with decimal numbers to two decimal places)* | *Recall and use addition and subtraction facts for 1 (with decimal numbers to two decimal places)* |
| **Mental methods** |  | *Select a mental strategy appropriate for the numbers involved in the calculation* | *Select a mental strategy appropriate for the numbers involved in the calculation* | *Select a mental strategy appropriate for the numbers involved in the calculation* | *Select a mental strategy appropriate for the numbers involved in the calculation* | *Select a mental strategy appropriate for the numbers involved in the calculation* |
| AS3 Add and subtract one-digit and two-digit numbers to 20, including zero *(using concrete objects and pictorial representations)* | AS7 Add and subtract numbers using concrete objects, pictorial representations, and mentally, including:- a two-digit number and  ones- a two-digit number and  tens- two two-digit numbers- adding three one-digit  numbers | AS10 Add and subtract numbers mentally, including:- a three-digit number and ones- a three-digit number and  tens- a three-digit number and  hundreds | *Add and subtract mentally combinations of two and three digit numbers and decimals to one decimal place* | AS18 Add and subtract numbers mentally with increasingly large numbers *and decimals to two decimal places* | ASMD4 Perform mental calculations, including with mixed operations and large numbers *and decimals* |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Number - addition and subtraction** |
| **Written methods** | *\*Written methods are informal at this stage – see mental methods for expectation of calculations* | *\*Written methods are informal at this stage – see mental methods for expectation of calculations* | Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction | AS14 Add and subtract numbers with up to 4 digits *and decimals with one decimal place* using the formal written methods of columnar addition and subtraction where appropriate | AS17 Add and subtract whole numbers with more than 4 digits *and decimals with two decimal places*, including using formal written methods (columnar addition and subtraction) | *Add and subtract whole numbers and decimals using formal written methods (columnar addition and subtraction)* |
| **Estimating and checking calculations** |  | AS9 Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems | AS12 Estimate the answer to a calculation and use inverse operations to check answers | AS15 Estimate and use inverse operations to check answers to a calculation | AS19 Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy | ASMD9 Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy |
| **Order of operations** |  |  |  |  |  | ASMD6 Use their knowledge of the order of operations to carry out calculations involving the four operations |
| **Solving addition and subtraction problems including those with missing numbers** | AS4 Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as7 = □ - 9 | AS5 Solve problems with addition and subtraction *including those with missing numbers*:AS5a- using concrete objects and pictorial representations, including those involving numbers, quantities and measuresAS5b- applying their increasing knowledge of mental and written methods | AS13 Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction | AS16 Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why*Solve addition and subtraction problems involving missing numbers* | AS20 Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why*Solve addition and subtraction problems involving missing numbers* | ASMD7 Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and whyASMD8 Solve problems involving addition, subtraction, multiplication and division, *including those with missing numbers* |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Number - multiplication and division** |
| **Understanding multiplication and division** |  |  | *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known or related fact, calculate mentally, use a jotting, written method)* | *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known or related fact, calculate mentally, use a jotting, written method)* | *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known or related fact, calculate mentally, use a jotting, written method)* | *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known or related fact, calculate mentally, use a jotting, written method)* |
|  | *Understand multiplication as repeated addition**Understand division as sharing and grouping and that a division calculation can have a remainder*MD4 Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot | *Understand that division is the inverse of multiplication and vice versa**Understand how multiplication and division statements can be represented using arrays**Understand division as sharing and grouping and use each appropriately* | MD11 Recognise and use factor pairs and commutativity in mental calculations | MD14 Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers |  |
| **Multiplication and division facts** |  | MD2 Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers | MD6 Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables | MD19 Recall multiplication and division facts for multiplication tables up to 12 × 12 | MD15 Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbersMD16 Establish whether a number up to 100 is prime and recall prime numbers up to 19MD21 Recognise and use square numbers and cube numbers, and the notation for squared (2) andcubed (3) | ASMD5 Identify common factors, common multiples and prime numbers |
| *Recall and use doubles of all numbers to 10 and corresponding halves* | *Derive and use doubles of simple two-digit numbers (numbers in which the ones total less than 10)**Derive and use halves of simple two-digit even numbers (numbers in which the tens are even)* | *Derive and use doubles of all numbers to 100 and corresponding halves**Derive and use doubles of all multiples of 50 to 500* | *Use partitioning to double or halve any number, including decimals to one decimal place* | *Use partitioning to double or halve any number, including decimals to two decimal places* | *Use partitioning to double or halve any number* |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Number - multiplication and division** |
| **Mental methods** |  | MD3 Calculate mathematical statements for multiplication *(using repeated addition)* and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs | MD7 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 methods | MD10 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 | MD18 Multiply and divide numbers mentally drawing upon known factsMD24 Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes | ASMD4 Perform mental calculations, including with mixed operations and large numbers |
| **Written methods** | *\*Written methods are informal at this stage – see mental methods for expectation of calculations* | *\*Written methods are informal at this stage – see mental methods for expectation of calculations* | MD7 Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, progressing to formal written methods | MD12 Multiply two-digit and three-digit numbers by a one-digit number using formal written layout | MD17 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 | ASMD1 Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplicationASMD1 Multiply one-digit numbers with up to two decimal places by whole numbers |
|  |  | MD7 Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers divided by one-digit numbers, progressing to formal written methods | *Divide numbers up to 3 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context* | MD19 Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context | ASMD2 Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the contextASMD3 Use written division methods in cases where the answer has up to two decimal places |
| **Estimating and checking calculations** |  |  | *Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy* | *Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy* | *Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy* | ASMD9 Use estimation *and inverse* to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy |
| **Order of operations** |  |  |  |  |  | ASMD6 Use their knowledge of the order of operations to carry out calculations involving the four operations |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Number - multiplication and division** |
| **Solving multiplication and division problems including those with missing numbers** | MD1 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 | MD5 Solve problems involving multiplication and division *(including those with remainders),* using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts | MD8 Solve problems, including missing number problems, involving multiplication and division *(and interpreting remainders)*, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects | MD13 Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, *division (including interpreting remainders),* integer scaling problems and harder correspondence problems such as n objects are connected to m objects | MD23 Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals signSolve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates | ASMD8 Solve problems involving addition, subtraction, multiplication and division |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Number - fractions (including decimals and percentages)** |
| **Understanding fractions** | *Understand that a fraction can describe part of a whole**Understand that a unit fraction represents one equal part of a whole* | *Understand and use the terms numerator and denominator**Understand that a fraction can describe part of a set**Understand that the larger the denominator is, the more pieces it is split into and therefore the smaller each part will be*  | *Show practically or pictorially that a fraction is one whole number divided by another (for example,* $\frac{3}{4}$ *can be interpreted as 3 ÷ 4)**Understand that finding a fraction of an amount relates to division* | *Understand that a fraction is one whole number divided by another (for example,* $\frac{3}{4}$ *can be interpreted as 3 ÷ 4)* |  |  |
| **Fractions of objects, shapes and quantities** | F1 Recognise, find and name a half as one of two equal parts of an object, shape or quantity *(including measure)*F2 Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity *(including measure)* | F3 Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity | F6 Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominatorsF7 Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators | *Recognise, find and write fractions of a discrete set of objects including those with a range of numerators and denominators* | F24 Recognise mixed numbers and improper fractions and convert from one form to the other |  |
|  |  | F5 Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 | Recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten | F27 Read and write decimal numbers as fractions (e.g. 0.71 = $\frac{71}{100}$ ) |  |
| **Counting, comparing and ordering fractions** |  | *Count on and back in steps of* $\frac{1}{2}$ *and* $\frac{1}{4}$ | *Count on and back in steps of* $\frac{1}{2}$*,* $\frac{1}{4}$ *and* $\frac{1}{3}$ | *Count on and back in steps of unit fractions*  | *Count on and back in mixed number steps such as* 1$\frac{1}{2}$ |  |
|  |  | F10 Compare and order unit fractions and fractions with the same denominators *(including on a number line)* | *Compare and order unit fractions and fractions with the same denominators (including on a number line) (continued from Year 3)* | F22 Compare and order fractions whose denominators are all multiples of the same number *(including on a number line)* | F35 Compare and order fractions, including fractions >1 *(including on a number line)* |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Number - fractions (including decimals and percentages)** |
| **Equivalence** |  | F4 Write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ | F8 Recognise and show, using diagrams, equivalent fractions with small denominators | F12 Recognise and show, using diagrams, families of common equivalent fractions | F23 Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths | F34 Use common factors to simplify fractions; use common multiples to express fractions in the same denomination |
|  |  |  | F16 Recognise and write decimal equivalents of any number of tenths or hundredthsF11 Recognise and write decimal equivalents to $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ | F28 Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents | F44 Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts |
|  |  |  |  |  | F39 Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$ ) |
| **Calculating with fractions** |  |  | F9 Add and subtract fractions with the same denominator within one whole *(using diagrams)* (for example, $\frac{5}{7}$ + $\frac{1}{7}$ = $\frac{6}{7}$ ) | F15 Add and subtract fractions with the same denominator *(using diagrams)* | F25 Add and subtract fractions with the same denominator and denominators that are multiples of the same number *(using diagrams)*F24 Write mathematical statements >1 as a mixed number(e.g. $\frac{2}{5}$ + $\frac{4}{5}$ = $\frac{6}{5}$ = 1$\frac{1}{5}$ ) | F36 Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions |
|  |  |  |  | F26 Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams | F37 Multiply simple pairs of proper fractions, writing the answer in its simplest form *(using diagrams)* (e.g. $\frac{1}{4}$ × $\frac{1}{2}$ = $\frac{1}{8}$) |
|  |  |  |  |  | F38 Divide proper fractions by whole numbers *(using diagrams)*(e.g. $\frac{1}{3}$ ÷ 2 = $\frac{1}{6}$ ) |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Number - fractions (including decimals and percentages)** |
| **Percentages** |  |  |  |  | F31 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, and as a decimal | *Find simple percentages of amounts* |
| **Solving problems involving fractions, decimals and percentages** |  |  | F11 Solve problems that involve all of the above | F14 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 fractions* | *Solve problems involving fractions* |
|  |  |  |  | F21 Solve simple measure and money problems involving fractions and decimals to two decimal places | F31 Solve problems involving number up to three decimal places | F43 Solve problems which require answers to be rounded to specified degrees of accuracy |
|  |  |  |  |  | F33 Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$ , $\frac{1}{5}$ , $\frac{2}{5}$ , $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25 | RP2 Solve problems involving the calculation of percentages (for example, of measures, and such as 15% of 360) and the use of percentages for comparison |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Ratio and proportion** |
| **Ratio and proportion** |  |  |  |  |  | RP1 Solve problems involving the relative sizes of two quantities where missing values can be found using integer multiplication and division factsRP4 Solve problems involving unequal sharing and grouping using knowledge of fractions and multiplesRP3 Solve problems involving similar shapes where the scale factor is known or can be found |
| **Algebra** |
| **Algebra** |  |  |  |  |  | A3 Express missing number problems algebraicallyA1 Use simple formulaeA2 Generate and describe linear number sequencesA4 Find pairs of numbers that satisfy an equation with two unknownsA5 Enumerate possibilities of combinations of two variables |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Measurement (length/height, perimeter, area and mass/weight)** |
| **Length / height** | M2 Measure and begin to record lengths and heights, *using non-standard and then manageable standard units (m and cm) within children’s range of counting competence* | M7 Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm) to the nearest appropriate unit using rulers | M15 Measure, add and subtract lengths (m/cm/mm) | M25 Estimate and calculate lengths | *Use, read and write standard units of length to a suitable degree of accuracy* | M36 Use, read and write standard units of length using decimal notation to three decimal places |
| M1 Compare and describe lengths and heights (for example, long/short, longer/shorter, tall/short, double/half) | M8 Compare and order lengths and record the results using >, < and = | M15 Compare lengths (m/cm/mm) | M25 Compare lengths | M29 Understand and use approximate equivalences between metric and common imperial units such as inches |  |
| **Perimeter** |  |  | *Understand that perimeter is a measure of distance around the boundary of a shape*M16 Measure the perimeter of simple 2-D shapes | M23 Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres | M30 Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres | M38 Recognise that shapes with the same areas can have different perimeters and vice versa |
| **Area** |  |  |  | *Understand that area is a measure of surface within a given boundary*M24 Find the area of rectilinear shapes by counting squares | M31 Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes | M40 Calculate the area of parallelograms and trianglesM39 Recognise when it is possible to use the formulae for area and volume of shapes |
| **Mass** | M2 Measure and begin to record mass/weight, *using non-standard and then standard units (kg and g) within children’s range of counting competence* | M7 Choose and use appropriate standard units to estimate and measure mass (kg/g) to the nearest appropriate unit using scales | M15 Measure, add and subtract mass (kg/g) | M25 Estimate and calculate mass | *Use, read and write standard units of mass to a suitable degree of accuracy* | M36 Use, read and write standard units of mass using decimal notation to three decimal places |
| M1b Compare and describe mass/weight (for example, heavy/light, heavier than, lighter than)  | M8 Compare and order mass and record the results using >, < and = | M15 Compare mass (kg/g) | M25 Compare mass | M29 Understand and use approximate equivalences between metric and common imperial units such as pounds  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Measurement (capacity, volume, temperature and conversion)** |
| **Capacity / volume** | M2c Measure and begin to record capacity and volume *using non-standard and then standard units (litres and ml) within children’s range of counting competence* | M7 Choose and use appropriate standard units to estimate and measure capacity and volume (litres/ml) to the nearest appropriate unit using measuring vessels | M15 Measure, add and subtract volume/capacity (l/ml) | M25 Estimate and calculate volume/capacity | M32 Estimate *(and calculate)* volume (for example, using 1 cm3 blocks to build cuboids (including cubes)) and capacity (for example, using water)*Understand the difference between liquid volume, including capacity and solid volume* | M36 Use, read and write standard units of volume using decimal notation to three decimal placesM41 Calculate and estimate volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3) and extending to other units (for example, mm3 and km3) |
| M1c Compare and describe capacity and volume (for example, full/empty, more than, less than, half, half full, quarter) | M8 Compare and order volume/capacity and record the results using >, < and = | M15 Compare volume/capacity (l/ml) | M25 Compare volume/capacity | M29 Understand and use approximate equivalences between metric and common imperial units such as pints | M41 Compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3) and extending to other units (for example, mm3 and km3) |
| **Temperature** |  | M7 Choose and use appropriate standard units to estimate and measure temperature to the nearest degree (°C) using thermometers | *Continue to estimate and measure temperature to the nearest degree (°C) using thermometers* | *Order temperatures including those below 0°C* | *Continue to order temperatures including those below 0°C* | *Calculate differences in temperature, including those that involve a positive and negative temperature* |
| **Conversion** |  |  |  | M22 Convert between different units of measure (e.g. kilometre to metre; hour to minute) | M28 Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)  | M36 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 three decimal places |
|  |  |  |  |  | M37 Convert between miles and kilometres |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Measurement (time)** |
| **Time** | M5 Recognise and use language relating to dates, including days of the week, weeks, months and years |  |  |  |  |  |
| M1d Compare and describe time (for example, quicker, slower, earlier, later) M4 Sequence events in chronological order using language (for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening | M12 Compare and sequence intervals of time | M19 Record and compare time in terms of seconds, minutes and hours; use vocabulary such as o’clock, a.m./p.m., morning, afternoon, noon and midnight | M22 Convert between different units of time, e.g. hour to minute | *Convert between units of time in a problem solving context* |  |
| M2d Measure and begin to record time (hours, minutes, seconds) | M14 Know the number of minutes in an hour and the number of hours in a day | M20 Know the number of seconds in a minute, and the number of days in each month, year and leap year |  |  |  |
| M6 Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times | M13 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 | M18 Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24- hour clocksM19 Estimate and read time with increasing accuracy to the nearest minute | M26 Read, write and convert time between analogue and digital 12 and 24-hour clocks | *Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks* | M36 Use, read and write standard units of time |
|  |  | M21 Compare durations of events (for example to calculate the time taken by particular events or tasks) |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Measurement (money and solving problems)** |
| **Money** | M3 Recognise and know the value of different denominations of coins and notes | M9 Recognise and use symbols for pounds (£) and pence (p) | *Continue to recognise and use symbols for pounds (£) and pence (p) and understand that the decimal point separates pounds and pence* | *Write amounts of money using decimal notation* |  |  |
|  | M9 Combine amounts to make a particular valueM10 Find different combinations of coins that equal the same amounts of money | *Recognise that ten 10p coins are equivalent to £1 and that each coin is* $\frac{1}{10}$ *of £1* | *Recognise that one hundred 1p coins are equivalent to £1 and that each coin is* $\frac{1}{100}$ *of £1* |  |  |
|  | M11 Add and subtract money of the same unit, including giving change | M17 Add and subtract amounts of money to give change, using both £ and p in practical contexts | M25 Estimate, compare and calculate money in pounds and pence |  |  |
| **Solving problems involving money and measures** | M1 Solve practical problems for:- lengths and heights- mass/weight- capacity and volume- time | M11 Solve simple problems in a practical context involving addition and subtraction of money *and measures (including time)* | *Solve problems involving money and measures and simple problems involving passage of time* | M27 Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days *and problems involving money and measures* | M34 Use all four operations to solve problems involving measure (for example, length, mass, volume, money) using decimal notation including scalingM34 Solve problems involving converting between units of time | M35 Solve problems involving the calculation and conversion of units of measure *(including money and time)*, using decimal notation up to three decimal places where appropriate |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Geometry - properties of shapes** |
| **Properties of shape** | PS1a Recognise and name common 2-D shapes, including rectangles (including squares), circles and triangles | PS2 Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical linePS4 Identify 2-D shapes on the surface of 3-D shapes, (for example, a circle on a cylinder and a triangle on a pyramid) | PS6 Draw 2-D shapes and describe them | PS10 Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizesPS12 Identify lines of symmetry in 2-D shapes presented in different orientationsPS13 Complete a simple symmetric figure with respect to a specific line of symmetry | PS19 Distinguish between regular and irregular polygons based on reasoning about equal sides and angles | PS22 Compare and classify geometric shapes based on their properties and sizes PS20 Draw 2-D shapes using given dimensions and angles |
|  |  | PS9 Identify horizontal and vertical lines and pairs of perpendicular and parallel lines | *Continue to identify horizontal and vertical lines and pairs of perpendicular and parallel lines* | PS18 Use the properties of rectangles to deduce related facts and find missing lengths and angles | PS23 Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius |
| PS1b Recognise and name common 3-D shapes, including cuboids (including cubes), pyramids and spheres | PS3 Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces | PS6 Make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them | PS10 Compare and classify geometric shapes based on their properties and sizes | PS14 Identify 3-D shapes, including cubes and other cuboids, from 2-D representations | PS21 Recognise, describe and build simple 3-D shapes, including making nets |
| **Angles and rotation** | PD1 Describe movement, including whole, half, quarter and three-quarter turns | PD3 Use mathematical vocabulary to describe movement, including rotation as a turn  | PS7 Recognise angles as a property of shape or a description of a turn |  |  |  |
|  | PD3 Understand the link between rotation and turns in terms of right angles for quarter, half and three- quarter turns (clockwise and anti-clockwise) | PS8 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 | PS11 Identify acute and obtuse angles and compare and order angles up to two right angles by size | PS15 Know angles are measured in degrees: estimate and compare acute, obtuse and reflex anglesPS16 Draw given angles, and measure them in degrees (°)PS17a-c Identify:- angles at a point and one  whole turn (total 360°) - angles at a point on a  straight line and 1/2 a turn  (total 180°)- other multiples of 90° | PS24 Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing anglesPS24 Find unknown angles in any triangles, quadrilaterals, and regular polygons |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Geometry - position and direction** |
| **Patterns** | *Recognise and create repeating patterns with objects and shapes* | PD2 Order and arrange combinations of mathematical objects in patterns and sequences |  |  |  |  |
| **Position and direction** | PD1 Describe position and direction | PD3 Use mathematical vocabulary to describe position, movement, including movement in a straight line  |  |  |  |  |
| **Coordinates (including reflection and translation)** |  |  | *Describe positions on a square grid labelled with letters and numbers* | PD4 Describe positions on a 2-D grid as coordinates in the first quadrant | *Describe positions on the first quadrant of a coordinate grid* | PD8 Describe positions on the full coordinate grid (all four quadrants) |
|  |  |  | PD6 Plot specified points and draw sides to complete a given polygon | *Plot specified points and complete shapes* |  |
|  |  |  | PD5 Describe movements between positions as translations of a given unit to the left/right and up/down | PD7 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 | PD9 Draw and translate simple shapes on the coordinate plane, and reflect them in the axes |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Statistics** |
| **Sorting and classifying** | *Sort objects, numbers and shapes to a given criterion and their own* | PD5 Compare and sort *objects, numbers and* common 2-D and 3-D shapes and everyday objects | *Use sorting diagrams to compare and sort objects, numbers and common 2-D and 3-D shapes and everyday objects* | *Use a variety of sorting diagrams to* compare and classify *numbers and* geometric shapes, including quadrilaterals and triangles, based on their properties and sizes | *Complete and interpret information in a variety of sorting diagrams (including those used to sort properties of numbers and shapes)* | *Continue to complete and interpret information in a variety of sorting diagrams (including those used to sort properties of numbers and shapes)* |
| **Present and interpret data** | *Present and interpret data in block diagrams using practical equipment* | S1 Interpret and construct simple pictograms, tally charts, block diagrams and simple tables | S4 Interpret and present data using bar charts, pictograms and tables | S6 Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs | S9 Complete, read and interpret information in tables, including timetables | S10 Interpret and construct pie charts and line graphs and use these to solve problems |
| **Solve problems using data** | *Ask and answer simple questions by counting the number of objects in each category**Ask and answer questions by comparing categorical data* | S2 Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantityS3 Ask and answer questions about totalling and comparing categorical data | S5 Solve one-step and two-step questions (for example, ‘How many more?’ and ‘How many fewer?’) using information presented in scaled bar charts and pictograms and tables | S7 Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs | S8 Solve comparison, sum and difference problems using information presented in *all types of graph including* a line graph | *Solve comparison, sum and difference problems using information presented in all types of graph* |
| **Averages** |  |  |  |  | *Calculate and interpret the mode, median and range*  | S11 Calculate and interpret the mean as an average |