|  |  |  |  |
| --- | --- | --- | --- |
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Strand 1 – Number** | | | |
| Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number | Count in multiples of 6, 7, 9, 25 and 1000 | 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 10 000 000 and determine the value of each digit |
| Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) | Find 1000 more or less than a given number | Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 | Round any whole number to a required degree of accuracy |
| Compare and order numbers up to 1000 | Count backwards through zero to include negative numbers | Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero | Use negative numbers in context, and calculate intervals across zero |
| Identify, represent and estimate numbers using different representations | Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones) | Round any number up to  1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 | Solve number and practical problems that involve all of the above |
| Read and write numbers up to 1000 in numerals and in words | Order and compare numbers beyond 1000 | Solve number problems and practical problems that involve all of the above |  |
| Solve number problems and practical problems involving these ideas | Identify, represent and estimate numbers using different representations | Read Roman numerals to 1000 (M) and recognise years written in Roman numerals |  |
|  | Round any number to the nearest 10, 100 or 1000 |  |  |
|  | Solve number and practical problems that involve all of the above and with increasingly large positive numbers |  |  |
|  | 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 |  |  |
| 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 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) |  |
| Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction | Estimate and use inverse operations to check answers to a calculation | Add and subtract numbers mentally with increasingly large numbers |  |
| Estimate the answer to a calculation and use inverse operations to check answers | Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why | Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy |  |
| Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction |  | Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why |  |
| 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 12x12 | Identify multiples and factors, including all factor pairs of a number, and common factors of two numbers | Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication |
| 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 | 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 | Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers | 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 |
| 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 | Recognise and use factor pairs and commutativity in mental calculations | Establish whether a number up to 100 is prime and recall prime numbers up to 19 | 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 context |
|  | 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 | Perform mental calculations, including with mixed operations and large numbers |
|  | 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 | Multiply and divide numbers mentally drawing upon known facts | Identify common factors, common multiples and prime numbers |
|  |  | 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 | Use their knowledge of the order of operations to carry out calculations involving the four operations |
|  |  | Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 | Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why |
|  |  | Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³) | Solve problems involving addition, subtraction, multiplication and division |
|  |  | Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes | Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy |
|  |  | 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 |  |
| Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 | Recognise and show, using diagrams, families of common equivalent fractions | Compare and order fractions whose denominators are all multiples of the same number | Use common factors to simplify fractions; use common multiples to express fractions in the same denomination |
| Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators | Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten | Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths | Compare and order fractions, including fractions >1 |
| Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators | 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 | 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 = 1 1/5) | Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions |
| Recognise and show, using diagrams, equivalent fractions with small denominators | Add and subtract fractions with the same denominator | Add and subtract fractions with the same denominator and denominators that are multiples of the same number | Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, ¼ x ½ = 1/8] |
| Add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7] | Recognise and write decimal equivalents of any number of tenths or hundredths | Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams | Divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6] |
| Compare and order unit fractions, and fractions with the same denominators | Recognise and write decimal equivalents to ¼; ½; ¾ | Read and write decimal numbers as fractions (e.g. 0.71 = 71/100) | Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8] |
| Solve problems that involve all of the above | 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 | Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents | Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places |
|  | 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 | Multiply one-digit numbers with up to two decimal places by whole numbers |
|  | 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 | Use written division methods in cases where the answer has up to two decimal places |
|  | Solve simple measure and money problems involving fractions and decimals to two decimal places | Solve problems involving number up to three decimal places | Solve problems which require answers to be rounded to specified degrees of accuracy |
|  |  | 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 | Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts |
|  |  | Solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator a multiple of 10 or 25 | 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 |
|  |  |  | Use simple formulae |
|  |  |  | Generate and describe linear number sequences |
|  |  |  | Express missing number problems algebraically |
|  |  |  | Find pairs of numbers that satisfy an equation with two unknowns |
|  |  |  | Enumerate possibilities of combinations of two variables |
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Strand 2 - Measurement** | | | |
| Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) | Convert between different units of measure [for example, kilometre to metre; hour to minute] | Convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre] | Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate |
| Measure the perimeter of simple 2-D shapes | Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres | Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints | 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 up to three decimal places |
| 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 | Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres | Convert between miles and kilometres |
| Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks | Estimate, compare and calculate different measures, including money in pounds and pence | 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 | Recognise that shapes with the same areas can have different perimeters and vice versa |
| Estimate and read time with increasing accuracy to the nearest minute; 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 | Read, write and convert time between analogue and digital 12- and 24-hour clocks | Estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] | Recognise when it is possible to use formulae for area and volume of shapes |
| Know the number of seconds in a minute and the number of days in each month, year and leap year | Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days | Solve problems involving converting between units of time | Calculate the area of parallelograms and triangles |
| Compare durations of events [for example to calculate the time taken by particular events or tasks] |  | Use all four operations to solve problems involving measure [e.g. length, mass, volume, money] using decimal notation, including scaling | Calculate, estimate and 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] |
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Strand 3 – Geometry** | | | |
| Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them | Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes | Identify 3-D shapes, including cubes and other cuboids, from 2-D representations | Draw 2-D shapes using given dimensions and angles |
| Recognise angles as a property of shape or a description of a turn | Identify acute and obtuse angles and compare and order angles up to two right angles by size | Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles | Recognise, describe and build simple 3-D shapes, including making nets |
| 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 lines of symmetry in 2-D shapes presented in different orientations | Draw given angles, and measure them in degrees (°) | Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons |
| Identify horizontal and vertical lines and pairs of perpendicular and parallel lines | Complete a simple symmetric figure with respect to a specific line of symmetry | Identify:   * angles at a point and one whole turn (total 360°) * angles at a point on a straight line and ½ a turn (total 180°) * other multiples of 90° | Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius |
|  |  | Use the properties of rectangles to deduce related facts and find missing lengths and angles | Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles |
|  |  | Distinguish between regular and irregular polygons based on reasoning about equal sides and angles |  |
|  | 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 |
|  | Plot specified points and draw sides to complete a given polygon. |  |  |
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Strand 4 - Statistics** | | | |
| 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 | Solve comparison, sum and difference problems using information presented in a line graph | Interpret and construct pie charts and line graphs and use these to solve problems |
| 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 | Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs | Complete, read and interpret information in tables, including timetables | Calculate and interpret the mean as an average |