**National Curriculum Key Learning Mathematics – Year 1**

|  |  |  |
| --- | --- | --- |
| * **Number – number and place value**
 | * **Number – addition and subtraction**
 | * **Number – multiplication and division**
 |
| * Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
* Count in multiples of twos, fives and tens
* Read and write numbers to 100 in numerals
* Read and write numbers from 1 to 20 in numerals and words
* *Begin to recognise the place value of numbers beyond 20 (tens and ones)*
* Identify and represent numbers using objects and pictorial representations including the number line
* Use the language of: equal to, more than, less than (fewer), most, least
* Given a number, identify one more and one less
* *Recognise and create repeating patterns with numbers, objects and shapes*
* *Identify odd and even numbers linked to counting in twos from 0and 1*
* *Solve problems and practical problems involving all of the above*
 | * Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
* Represent and use number bonds and related subtraction facts within 20
* Add and subtract one-digit and two-digit numbers to 20, including zero *(using concrete objects and pictorial representations)*
* Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9
 | * *Recall and use doubles of all numbers to 10 and corresponding halves*
* 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
 |
| * **Measurement**
 |
| * Measure and begin to record:
* - lengths and heights, *using non-standard and then manageable standard units (m/cm) -* mass/weight, *using non-standard and then manageable standard  units (kg/g)*
* - capacity and volume *using non-standard and then manageable  standard units (litres/ml)*
	+ time (hours/minutes/seconds)
* *within children’s range of counting competence*
* Compare, describe and solve practical problems for:
* - lengths and heights (for example, long/short, longer/shorter,  tall/short, double/half)
	+ mass/weight (for example, heavy/light, heavier than, lighter than)
* - capacity and volume (for example, full/empty, more than, less than,  half, half full, quarter)
	+ time (for example, quicker, slower, earlier, later)
* Recognise and use language relating to dates, including days of the week, weeks, months and years
* Sequence events in chronological order using language (for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening
* Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times
* Recognise and know the value of different denominations of coins and notes
 |
| * **Number – fractions**
 | * **Geometry – properties of shapes**
 |
| * *Understand that a fraction can describe part of a whole*
* *Understand that a unit fraction represents one equal part of a whole*
* Recognise, find and name a half as one of two equal parts of an object shape or quantity *(including measure)*
* Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity *(including measure)*
 | * Recognise and name common 2-D shapes, including rectangles (including squares), circles and triangles
* Recognise and name common 3-D shapes, including cuboids (including cubes), pyramids and spheres
 |
| * **Geometry – position and direction**
 |
| * Describe movement, including whole, half, quarter and three-quarter turns
* *Recognise and create repeating patterns with objects and shapes*
* Describe position and direction
 |
| * **Statistics**
 |
| * *Sort objects, numbers and shapes to a given criterion and their own*
* *Present and interpret data in block diagrams using practical equipment*
* *Ask and answer simple questions by counting the number of objects in each category*
* *Ask and answer questions by comparing categorical data*
 |

**National Curriculum Key Learning Mathematics – Year 2**

|  |  |  |
| --- | --- | --- |
| * **Number – number and place value**
 | * **Number – addition and subtraction**
 | * **Number – multiplication and division**
 |
| * Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
* Read and write numbers to at least 100 in numerals and in words
* Recognise the place value of each digit in a two-digit number (tens, ones)
* Identify, represent and estimate numbers using different representations, including the number line
* *Partition numbers in different ways (e.g. 23 = 20 + 3 and23 = 10 + 13)*
* Compare and order numbers from 0 up to 100; use <, > and = signs
* *Find 1 or 10 more or less than a given number*
* *Round numbers to at least 100 to the nearest 10*
* *Understand the connection between the 10 multiplication table and place value*
* *Describe and extend simple sequences involving counting on or back in different steps*
* Use place value and number facts to solve problems
 | * *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting)*
* *Select a mental strategy appropriate for the numbers involved in the calculation*
* 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)*
* 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)*
* 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
* Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
* Solve problems with addition and subtraction *including with missing numbers:*- using concrete objects and pictorial representations, including those  involving numbers, quantities and measures- applying their increasing knowledge of mental and written methods
 | * *Understand multiplication as repeated addition*
* *Understand division as sharing and grouping and that a division calculation can have a remainder*
* Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
* Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
* *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)*
* Calculate mathematical statements for multiplication *using repeated addition)* and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
* 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
 |
| * **Number – fractions**
 |
| * *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*
* 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
* Write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$
* *Count on and back in steps of* $\frac{1}{2}$ *and* $\frac{1}{4}$
 |
| * **Measurement**
 |
| * **Geometry – properties of shapes**
 | * Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity and volume (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
* Compare and order lengths, mass, volume/capacity and record the results using >, < and =
* 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
* Compare and sequence intervals of time
* 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
* Know the number of minutes in an hour and the number of hours in a day
* Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change *and measures (including time)*
 |
| * Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
* Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
* Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
 |
| * **Geometry – position and direction**
 |
| * Order/arrange combinations of mathematical objects in patterns/sequences
* 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 anti-clockwise)
 |
| * **Statistics**
 |
| * Compare and sort *objects, numbers and* common 2-D and 3-D shapes and everyday objects
* 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
 |

**National Curriculum Key Learning Mathematics – Year 3**

|  |  |  |
| --- | --- | --- |
| * **Number – number and place value**
 | * **Number – addition and subtraction**
 | * **Number – multiplication and division**
 |
| * Count from 0 in multiples of 4, 8, 50 and 100
* Count up and down in tenths
* Read and write numbers up to 1000 in numerals and in words
* *Read and write numbers with one decimal place*
* Identify, represent and estimate numbers using different representations *(including the number line)*
* Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)
* *Identify the value of each digit to one decimal place*
* *Partition numbers in different ways (e.g. 146 = 100+ 40+6 and 146 = 130+16)*
* Compare and order numbers up to 1000
* *Compare and order numbers with one decimal place*
* Find *1,* 10 or 100 more or less than a given number
* *Round numbers to at least 1000 to the nearest 10 or 100*
* *Find the effect of multiplying a one- or two-digit number by 10 and 100, identify the value of the digits in the answer*
* *Describe and extend number sequences involving counting on or back in different steps*
* *Read Roman numerals from I to XII*
* Solve number problems and practical problems involving these ideas
 | * *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)*
* *Select a mental strategy appropriate for the numbers involved in the calculation*
* *Understand and use take away and difference for subtraction, deciding on the most efficient method for the numbers involved, irrespective of context*
* *Recall/use addition/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*
* 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 three digits, using formal written methods of columnar addition and subtraction
* Estimate the answer to a calculation and use inverse operations to check answers
* Solve problems, including missing number problems, using number facts, place value, and more complex 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, written method)*
* *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*
* Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
* *Derive and use doubles of all numbers to 100 and corresponding halves*
* *Derive and use doubles of all multiples of 50 to 500*
* 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 estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy*
* 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
 |
| * **Measures**
 |
| * **Number – fractions**
 | * **Geometry – properties of shapes**
 | * Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
* *Continue to estimate and measure temperature to the nearest degree (°C) using thermometers*
* *Understand perimeter is a measure of distance around the boundary of a shape*
* Measure the perimeter of simple 2-D shapes
* 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/read time with increasing accuracy to the nearest minute
* Record/compare time in terms of seconds, minutes, hours; use vocabulary such as o’clock, a.m./p.m., morning, afternoon, noon, midnight
* Know the number of seconds in a minute and the number of days in each month, year and leap year
* Compare durations of events [for example to calculate the time taken by particular events or tasks]
* *Continue to recognise and use the symbols for pounds (£) and pence (p) and understand that the decimal point separates pounds/pence*
* *Recognise that ten 10p coins equal £1 and that each coin is* $\frac{1}{10}$ *of £1*
* Add and subtract amounts of money to give change, using both £ and p in practical contexts
* *Solve problems involving money and measures and simple problems involving passage of time*
 |
| * *Show practically or pictorially that a fraction is one whole number divided by another (e.g.* $\frac{3}{4}$ *can be interpreted as 3 ÷ 4)*
* *Understand that finding a fraction of an amount relates to division*
* Recognise that tenths arise from dividing objects into 10 equal parts and in dividing one-digit numbers or quantities by 10
* Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
* Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
* Recognise and show, using diagrams, equivalent fractions with small denominators
* Add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7}$ + $\frac{1}{7}$ = $\frac{6}{7}$]
* Compare and order unit fractions, and fractions with the same denominators *(including on a number line)*
* *Count on and back in steps of* $\frac{1}{2}$ *,* $\frac{1}{4}$ *and* $\frac{1}{3}$
* Solve problems that involve all of the above
 | * Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
* Recognise angles as a property of shape or a description of a turn
* 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 horizontal and vertical lines and pairs of perpendicular and parallel lines
 |
| * **Geometry – position and direction**
 |
| * *Describe positions on a square grid labelled with letters and numbers*
 |
| * **Statistics**
 |
| * *Use sorting diagrams to compare and sort objects, numbers and common 2-D and 3-D shapes and everyday objects*
* Interpret and present data using bar charts, pictograms and tables
* 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
 |

**National Curriculum Key Learning Mathematics – Year 4**

|  |  |  |
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| **Number – number and place value** | **Number – addition and subtraction** | **Number – multiplication and division** |
| * Count in multiples of 6, 7, 9, 25 and 1000
* Count backwards through zero to include negative numbers
* Count up and down in hundredths
* *Read and write numbers to at least 10 000*
* *Read and write numbers with up to two decimal places*
* Recognise the place value of each digit in a four-digit number
* *Identify the value of each digit to two decimal places*
* *Partition numbers in different ways (e.g. 2.3 = 2+0.3 & 1+1.3)*
* Identify, represent and estimate numbers using different representations *(including the number line)*
* Order and compare numbers beyond 1000
* *Order and* compare numbers with the same number of decimal places up to two decimal places
* Find *0.1, 1, 10, 100 or* 1000 more or less than a given number
* Round any number to the nearest 10, 100 or 1000
* Round decimals (one decimal place) to the nearest whole number
* Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer
* *Describe and extend number sequences involving counting on or back in different steps, including sequences with multiplication and division steps*
* Read Roman numerals to 100 and know that over time, the numeral system changed to include the concept of zero and place value
* Solve number and practical problems that involve all of the above and with increasingly large positive numbers
 | * *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)*
* *Select a mental strategy appropriate for the numbers involved in the calculation*
* *Recall and use addition and subtraction facts for 100*
* *Recall and use +/- 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)*
* *Add and subtract mentally combinations of two and three digit numbers and decimals to one decimal place*
* 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
* Estimate; use inverse operations to check answers to a calculation
* 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*
 | * *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)*
* Recognise and use factor pairs and commutativity in mental calculations
* Recall multiplication and division facts for multiplication tables up to 12 × 12
* *Use partitioning to double or halve any number, including decimals to one decimal place*
* 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 two-digit and three-digit numbers by a one-digit number using formal written layout
* *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*
* *Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy*
* 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
 |
| **Geometry – properties of shapes** |
| * Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes
* Identify lines of symmetry in 2-D shapes presented in different orientations
* Complete a simple symmetric figure with respect to a specific line of symmetry
* *Continue to identify horizontal and vertical lines and pairs of perpendicular and parallel lines*
* Identify acute and obtuse angles and compare and order angles up to two right angles by size
 |
| **Number – fractions and decimals** |
| * *Understand that a fraction is one whole number divided by another (e.g.* $\frac{3}{4}$ *can be interpreted as 3 ÷ 4)*
* *Recognise, find and write fractions of a discrete set of objects including those with a range of numerators and denominators*
* Recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten
* *Count on and back in steps of unit fractions*
* *Compare and order unit fractions and fractions with the same denominators (including on a number line)*
* Recognise and show, using diagrams, families of common equivalent fractions
* Recognise and write decimal equivalents of any number of tenths or hundredths
* Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$
* Add and subtract fractions with the same denominator *(using diagrams)*
* 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 simple measure and money problems involving fractions and decimals to two decimal places
 |
| **Measurement** |
| * Estimate, compare and calculate different measures, including money in pounds and pence
* *Order temperatures including those below 0°C*
* Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres
* *Know area is a measure of surface within a given boundary*
* Find the area of rectilinear shapes by counting squares
* Convert between different units of measure [e.g. kilometre to metre; hour to minute]
* Read, write and convert time between analogue and digital 12- and 24-hour clocks
* *Write amounts of money using decimal notation*
* *Recognise that one hundred 1p coins equal £1 and that each coin is* $\frac{1}{100}$ *of £1*
* Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days *and problems involving money and measures*
 |
| **Geometry – position and direction** |
| * Describe positions on a 2-D grid as coordinates in the first quadrant
* Plot specified points and draw sides to complete a given polygon
* Describe movements between positions as translations of a given unit to the left/right and up/down
 |
| **Statistics** |
| * *Use a variety of sorting diagrams to* compare and classify *numbers and* geometric shapes based on their properties and sizes
* Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts, time graphs
* Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs
 |

**National Curriculum Key Learning Mathematics – Year 5**

|  |  |  |
| --- | --- | --- |
| **Number – number and place value** | **Number – addition and subtraction** | **Number – multiplication and division** |
| * 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*
* 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 with up to 3 decimal places
* *Identify the value of each digit to three decimal places*
* *Identify represent and estimate numbers using the number line*
* *Find 0.01, 0.1, 1, 10, 100, 100 and other powers of 10 more or less than a given number*
* Round any number up to 1 000 000 to the nearest 10, 100, 1000,10 000 and 100 000
* Round decimals with two decimal places to the nearest whole number and to one decimal place
* Multiply/divide whole numbers and decimals by 10, 100 and 1000
* Interpret negative numbers in context, count on and back with positive and negative whole numbers, including through zero
* *Describe and extend number sequences including those with multiplication/division steps and where the step size is a decimal*
* Read Roman numerals to 1000 (M); recognise years written as such
* Solve number and practical problems that involve all of the above
 | * *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)*
* *Select a mental strategy appropriate for the numbers involved in the calculation*
* *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)*
* Add and subtract numbers mentally with increasingly large numbers *and decimals to two decimal places*
* 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)
* Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
* 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*
 | * *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)*
* Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
* Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
* Establish whether a number up to 100 is prime and recall prime numbers up to 19
* Recognise and use square (2) and cube (3) numbers, and notation
* *Use partitioning to double or halve any number, including decimals to two decimal places*
* Multiply and divide numbers mentally drawing upon known facts
* Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
* 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
* 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 estimation/inverse to check answers to calculations; 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
 |
| **Geometry – properties of shapes** |
| * Distinguish between regular and irregular polygons based on reasoning about equal sides and angles
* Use the properties of rectangles to deduce related facts and find missing lengths and angles
* Identify 3-D shapes from 2-D representations
* Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
* Draw given angles, and measure them in degrees (°)
* Identify:

- angles at a point and one whole turn (total 360°)- angles at a point on a straight line and half a turn (total 180°)- other multiples of 90° |
| **Number – fractions, decimals and percentages** |
| * Recognise mixed numbers and improper fractions and convert from one form to the other
* Read and write decimal numbers as fractions (e.g. 0.71 = $\frac{71}{100})$
* *Count on and back in mixed number steps such as 1*$\frac{1}{2}$
* Compare and order fractions whose denominators are all multiples of the same number *(including on a number line)*
* Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
* Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
* Add and subtract fractions with denominators that are the same and that are multiples of the same number *(using diagrams)*
* Write statements > 1 as a mixed number (e.g. $\frac{2}{5}$ + $\frac{4}{5}$ = $\frac{6}{5}$ =1 $\frac{1}{5}$)
* Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
* 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
* *Solve problems involving fractions and decimals to three places*
* 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 fractions with a denominator of a multiple of 10 or 25
 |
| **Measurement** |
| * *Use, read and write standard units of length and mass*
* Estimate *(and calculate)* volume ((e.g., using 1 cm3 blocks to build cuboids (including cubes)) and capacity (e.g. using water)
* *Understand the difference between liquid volume and solid volume*
* *Continue to order temperatures including those below 0°C*
* Convert between different units of metric measure
* Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
* Measure/calculate the perimeter of composite rectilinear shapes
* Calculate and compare the area of rectangle, use standard units square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes
* *Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks*
* Solve problems involving converting between units of time
* Use all four operations to solve problems involving measure using decimal notation, including scaling
 |
| **Geometry – position and direction** |
| * *Describe positions on the first quadrant of a coordinate grid*
* *Plot specified points and complete shapes*
* 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
 |
| **Statistics** |
| * *Complete and interpret information in a variety of sorting diagrams (including those used to sort properties of numbers and shapes)*
* Complete, read and interpret information in tables and timetables
* Solve comparison, sum and difference problems using information presented in *all types of graph including*  a line graph
* *Calculate and interpret the mode, median and range*
 |

**National Curriculum Key Learning Mathematics – Year 6**

|  |  |  |
| --- | --- | --- |
| **Number – number and place value** | **Number – addition and subtraction** | **Number – multiplication and division** |
| * *Count forwards or backwards in steps of integers, decimals, powers of 10*
* Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
* Identify the value of each digit to three decimal places
* *Identify, represent and estimate numbers using the number line*
* *Order and compare numbers including integers, decimals and negative numbers*
* *Find 0.001, 0.01, 0.1, 1, 10 and powers of 10 more/less than a given number*
* Round any whole number to a required degree of accuracy
* *Round decimals with three decimal places to the nearest whole number or one or two decimal places*
* Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
* Use negative numbers in context, and calculate intervals across zero
* *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*
* Solve number and practical problems that involve all of the above
 | * *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)*
* *Select a mental strategy appropriate for the numbers in the calculation*
* *Recall and use addition and subtraction facts for 1 (with decimals to two decimal places)*
* Perform mental calculations including with mixed operations and large numbers *and decimals*
* *Add and subtract whole numbers and decimals using formal written methods (columnar addition and subtraction)*
* Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
* Use knowledge of the order of operations to carry out calculations
* Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
* Solve problems involving all four operations, *including those with missing numbers*
 | * *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)*
* Identify common factors, common multiples and prime numbers
* *Use partitioning to double or halve any number*
* Perform mental calculations, including with mixed operations and large numbers
* Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
* Multiply one-digit numbers with up to two decimal places by whole numbers
* Divide numbers up to 4 digits by a two-digit whole number using the formal written methods of short or 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
* Use estimation *and inverse* to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
* Use knowledge of the order of operations to carry out calculations
* Solve problems involving all four operations, *including those with missing numbers*
 |
| **Number – fractions, decimals and percentages** | **Geometry – properties of shapes** |
| * Compare and order fractions, including fractions > 1 *(including on a number line)*
* Use common factors to simplify fractions; use common multiples to express fractions in the same denomination
* Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
* Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375 and $\frac{3}{8}$ )
* Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
* Multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4}$ x $\frac{1}{2}$ = $\frac{1}{8}$ )
* Divide proper fractions by whole numbers (e.g. $\frac{1}{3}$ ÷ 2 = $\frac{1}{6}$ )
* *Find simple percentages of amounts*
* *Solve problems involving fractions*
* Solve problems which require answers to be rounded to specified degrees of accuracy
* Solve problems involving the calculation of percentages (e.g. of measures and such as 15% of 260) and the use of percentages for comparison
 | * Compare/classify geometric shapes based on the properties and sizes
* Draw 2-D shapes using given dimensions and angles
* Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
* Recognise, describe and build simple 3-D shapes, including making nets
* Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
* Find unknown angles in any triangles, quadrilaterals, regular polygons
 |
| **Measurement** |
| **Geometry – position and direction** | * Use, read and write standard units of length, mass, volume and time using decimal notation to three decimal places
* Convert between standard units of length, mass, volume and time using decimal notation to three decimal places
* Convert between miles and kilometres
* Recognise that shapes with the same areas can have different perimeters and vice versa
* Calculate the area of parallelograms and triangles
* Recognise when it is possible to use formulae for area and volume of shapes
* 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 (e.g. mm3 and km3)
* *Calculate differences in temperature, including those that involved a positive and negative temperature*
* Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
 |
| * Describe positions on the full coordinate grid (all four quadrants)
* Draw and translate simple shapes on the coordinate plane, and reflect them in the axes
 |
| **Statistics** |
| * *Continue to complete and interpret information in a variety of sorting diagrams (including sorting properties of numbers and shapes)*
* Interpret and construct pie charts and line graphs and use these to solve problems
* *Solve comparison, sum and difference problems using information presented in all types of graph*
* Calculate and interpret the mean as an average
 |
| **Ratio and proportion** |
| * Solve problems involving the relative sizes of two quantities where missing values can be found using integer multiplication/division facts
* Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
* Solve problems involving similar shapes where the scale factor is known or can be found
 | **Algebra** |
| * 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
 |