Problem Solving and reasoning skills will be taught throughout.

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| **Place Value** | | | | |
|  | **Counting** | **Represent** | **Use and Compare** | **Rounding and Problems** |
| **Early Years** | Have a deep understanding of numbers to 10 including the composition of each number.  Subitise up to 5  Automatically recall number bonds up to 5 and some number bonds to 10 including double facts.  Verbally count beyond 20, recognising the pattern of the counting system.  Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.  Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.  To count reliably with numbers from 1 to 20.  To say which number is one more or one less than a given number from 1 to 20  To place numbers 1 to 20 in order. | | | |
| **Year 1** | Count to and across 100, forwards  and backwards, beginning with 0 or  1, or from any given number.  Count numbers to 100 in numerals; count in multiples of twos, fives and tens. | Identify and represent numbers using objects and pictorial representations.  Read and write numbers to 100 in numerals.  Read and write numbers from 1 to 20 in numerals and words. | Give a number, identify one more and one less. |  |
| **Year 2** | Count in steps of 2, 3 and 5 from 0,  and in tens from any number forwards and backward. | Read and write numbers to at least 100 in numerals and words.  Identify, represent and estimate numbers using different representations, including a number line. | Recognise the place value of each digit in a two-digit number.  Compare and order numbers from 0 up to 100; use < > and = signs. | Use place value and number facts to solve problems. |
| **Year 3** | Count from 0 in multiples of 4, 8, 50  and 100; find 10 or 100 more or less  than a given number. | Read and write numbers up to 1000 in numerals and words.  Identify, represent and estimate numbers using different representations. | Recognise the place value of each digit in a three-digit number.  Compare and order numbers up to 1000. | Solve number problems and practical problems involving these ideas. |
| **Year 4** | Count in multiples of 6, 7, 9, 25 and  1000.  Count backwards through zero to include negative numbers. | Read Roman numerals to 100 and know  that over time, the numeral system changed to include the concept of zero and place value.  Identify, represent and estimate numbers using different representations. | Find 1000 more or less than a given number.  Recognise the place value of each digit in a four-digit number.  Compare and order numbers beyond  1000. | Round any number to the nearest 10,  100 or 1000.  Solve number and practical problems that involve all of these ideas. |
| **Year 5** | Count forwards or backwards in steps  of powers of 10 for any given number  up to 1,000,000.  Count forwards and backwards with  positive and negative whole numbers,  including through zero. | Read and write numbers to at least  1,000,000 and determine the value of each digit.  Read Roman numerals to 1000 and recognise years written in Roman numerals. | Order and compare numbers to at least  1,000,000 and determine the value of each digit. | Interpret negative numbers in context.  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 these ideas. |
| **Year 6** |  | Read and write numbers to at least  10,000,000 and determine the value of each digit. | Order and compare numbers up to  10,000,000 and determine the value of each digit. | Round any whole number to a required degree of accuracy.  Use negative numbers in context, and calculate intervals across zero.  Solve number and practical problems that involve all of these ideas. |

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| **Addition and Subtraction** | | | |
|  | **Recall, Represent, Use** | **Calculations** | **Solve Problems** |
| **Early Years** | To add and subtract two single-digit numbers and count on and back to find the answer using quantities and objects.  To solve problems, including doubling, halving and sharing | | |
| **Year 1** | 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. | Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems. |
| **Year 2** | Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.  Show that addition can be done in any order (commutative) and subtraction of one number from another cannot.  Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. | 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 | Solve problems with addition and subtraction using  concrete objects and pictorial representations including those involving numbers, quantities and measure.  Solve problems with increasing knowledge of mental  and written methods |
| **Year 3** | Estimate the answer to a calculation and use inverse operations to check answers. | 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. | Solve problems involving missing number problems,  using number facts, place value and more complex addition and subtraction. |
| **Year 4** | Estimate and use inverse operations to check answers to a calculation. | Add and subtract numbers with up to four digits using  formal written methods of columnar addition and subtraction where appropriate. | Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. |
| **Year 5** | Use rounding to check answers to calculations and determine levels of accuracy. | Add and subtract whole numbers with more than four digits, including using formal written methods.  Add and subtract mentally with increasingly large numbers. | Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. |
| **Year 6** |  | Perform mental calculations, including with mixed operations and large numbers.  Use their knowledge of the order of operations to carry out calculations involving the four operations. | Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. |

| **Multiplication and Division** | | | |
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|  | **Recall, Represent, Use** | **Calculations** | **Solve Problems** |
| **Year 1** |  |  | 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. |
| **Year 2** | Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers  Show that multiplication of two numbers can be done in any order (commutative) and division odd one number by another cannot. | Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication, division and equals sign. | Solve problems involving multiplication and division,  using materials, arrays, repeated addition, mental  methods, and multiplication |
| **Year 3** | Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. | 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 strategies and progressing to formal written methods. | 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 |
| **Year 4** | Recall multiplication and division facts for multiplication  tables up to 12x12.  Use place value, know and derived facts to multiply and divide mentally, including:  - multiplying by 0 and 1  - dividing by 1  - multiplying together three numbers  Recognise and use factor pairs and commutativity in  mental calculations. | Multiply two-digit and three-digit numbers by a one-digit number using a formal written layout. | 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 |
| **Year 5** | Identify multiples and factors, including 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 1—is prime and recall prime numbers up to 19.  Recognise and use square numbers and cube numbers, and the notation for squared and cubed. | Multiply numbers with up to four-digits by a one or two digit number using a formal written method, including long multiplication for two-digit numbers.  Multiply and divide numbers mentally drawing upon known facts.  Divide numbers with up to four-digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.  Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. | Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.  Solve problems involving addition, subtraction, multiplication and division 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. |

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| **Year 6** | Identify common factors, common multiples and prime numbers.  Use estimation to check answers to calculations and  determine, in the context of a problem, an appropriate  degree of accuracy. | Multiply multi-digit numbers with up to four-digits by a two-digit whole number using the formal written method of long multiplication.  Divide numbers with up to four-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.  Divide numbers with up to four-digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.  Perform mental calculations, including with mixed operations and large numbers. | Solve problems involving addition, subtraction, multiplication and division.  Use their knowledge of the order of operations to carry  out calculations involving the four operations |

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| **Fractions** | | | | |
|  | **Recognise and Write** | **Compare** | **Calculations** | **Solve Problems** |
| **Year 1** | Recognise, f find and name a half as one of two equal parts of an object, shape or quantity.  Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. |  |  |  |
| **Year 2** | Recognise, find, name and write  fractions 1/3, 1/4, 2/4 and 3/4 of a length,  shape, set of objects or quantity  Write simple fractions for example, 1/2  of 6 = 3 | Recognise the equivalence of 2/4 and 1/2 . | Write simple fractions for example, 1/2 of 6  = 3 |  |
| **Year 3** | Count up and down in tenths;  recognise that tenths arise f rom  dividing an object 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.  Compare and order unit fractions, and fractions with the same denominators. | Add and subtract fractions with the same  denominator within one whole | Solve problems that involve all of the  above |
| **Year 4** | Count up and down in hundredths; recognise that hundredth arise when dividing an object by one hundred and dividing tenths by ten. | Recognise and show, using diagrams, families of common equivalent fractions. | Add and subtract fractions with the same denominator. | 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. |
| **Year 5** | Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.  Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number. | Compare and order fractions whose denominators are all multiples of the same number. | Add and subtract fractions with the same denominator and denominators that are multiples of the same number.  Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. |  |
| **Year 6** |  | Use common factors to simplify fractions;  Use common multiples to express fractions in the same denomination.  Compare and order fractions, including fractions > 1. | 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.  Divide proper fractions by whole numbers |  |

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| **Decimals** | | | |
|  | **Recognise and Write** | **Compare** | **Calculations and Problems** |
| **Year 4** | Recognise and write decimal equivalents of any number of tenths or hundredths.  Recognise and write decimal equivalents to 1/4, 1/2, 3/4 | Round decimals with one decimal place to the nearest  whole number  Compare numbers with the same number of decimal  places up to two decimal places | 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. |
| **Year 5** | Read and write decimal numbers as fractions.  Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. | Round decimals with two decimal places to the nearest whole number and to one decimal place.  Read, write, order and compare numbers with up to three decimal places. | Solve problems involving number up to three decimal  places |
| **Year 6** | Identify the value of each digit in numbers given to three decimal places. |  | Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.  Multiply one-digit numbers with up to two decimal places by whole numbers.  Use written division methods in cases where the answer has up to two decimal places.  Solve problems which require answers to be rounded to specified degrees of accuracy. |

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| **Fractions, Decimals and Percentages** | |
| **Year 4** | Solve simple measure and money problems involving fractions and decimals to two decimal places. |
| **Year 5** | 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 which require knowing percentage and decimal equivalents of ½, ¼, 1/5,, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25. |
| **Year 6** | Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction.  Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. |

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| **Ratio and Proportion** | | **Algebra** |
| **Year 6** | Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.  Solve problems involving the calculation of percentages 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.  *\*\* Although algebraic notation is not introduced until Year 6, algebraic thinking starts much earlier as exemplified by the ‘missing number’ objectives in Years 1, 2 and 3* |

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| **Measures** | | | | |
|  | **Using Measures** | **Money** | **Time** | **Perimeter, area and volume** |
| **Early Years** | To use everyday languages to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and solve problems. | | | |
| **Year 1** | Compare, describe and solve  practical problems for:  - lengths and heights  - mass/weight  - capacity and volume  - time  Measure and begin to record the  following:  - lengths and heights  - mass/weight  - capacity and volume  - time | Recognise and know the value of different  denominations of coins and notes | Sequence events in chronological order  using language: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening.  Recognise and use language relating to  dates, including days of the week, weeks,  months and years  Tell the time to the hour and half past the  hour and draw the hands on a clock face  to show these times. |  |
| **Year 2** | Choose and use appropriate  standard units to estimate and  measure length/height in any  direction (m/cm); mass (kg/g);  temperature (°C); capacity (litres/ml)  to the nearest appropriate unit, using  rulers, scales, thermometers and  measuring vessels  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.  Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change. | 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. |  |
| **Year 3** | Measure, compare, add and subtract:  lengths (m/cm/mm); mass (kg/g);  volume/capacity (l/ml) | Add and subtract amounts of money to give change, using both £ and p in practical contexts. | Tell and write the time from an analogue  clock, including using Roman numerals  from I to XII, and 12-hour and 24-hour clocks.  Estimate and read time with increasing  accuracy to the nearest minute; record  and compare time in terms of seconds,  minutes and hours; use vocabulary such  as o’clock, a.m./p.m., morning, afternoon, noon and 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. | Measure the perimeter of simple 2D  shapes |
| **Year 4** | Convert between different units of measure.  Estimate, compare and calculate different measures. | Estimate, compare and calculate different  measures, including money in pounds and pence. | Read, write and convert time between  analogue and digital 12- and 24-hour clocks.  Solve problems involving converting f rom  hours to minutes; minutes to seconds; years to months; weeks to days. | Measure and calculate the perimeter  of a rectilinear figure (including squares) in centimetres and metres.  Find the area of rectilinear shapes by counting squares. |
| **Year 5** | 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.  Use all four operations to solve problems involving measure using decimal notation, including scaling. | Use all four operations to solve problems involving money. | Solve problems involving converting  between units of time | Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.  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.  Estimate volume and capacity. |
| **Year 6** | Solve problems involving the  calculation and conversion of units of  measure, using decimal notation up to three decimal places where appropriate.  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.  Convert between miles and kilometres. |  | Use, read, write and convert between  standard units, converting measurements  of time from a smaller unit of measure to  a larger unit, and vice versa. | Recognise that shapes with the same  areas can have different perimeters and vice versa.  Recognise when it is possible to use formulae for area and volume of shapes.  Calculate the area of parallelograms and triangles.  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. |

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| **Geometry** | | | | |
|  | **2D shapes** | **3D shapes** | **Angles and Lines** | **Position and Direction** |
| **Early Years** | To explore characteristics of everyday objects and shapes and use mathematical language to describe them.  To recognise, create and describe patterns. | | | |
| **Year 1** | Recognise and name common 2-D shapes, including: rectangles, squares, circles and triangles. | Recognise and name common 3-D shapes, including: cuboids, cubes, pyramids and spheres. |  | Describe position, direction and movement, including whole, half , quarter and three quarter turns. |
| **Year 2** | Identify and describe the properties of  2-D shapes, including the number of  sides and line symmetry in a vertical line.  Identify 2-D shapes on the surface of  3-D shapes.  Compare and sort common 2-D shapes and everyday objects. | Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces.  Compare and sort common 3-D shapes and everyday objects. |  | Order and arrange combinations of mathematical objects in patterns and 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 anticlockwise). |
| **Year 3** | Draw2D-Shapes. | 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. |  |
| **Year 4** | 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. |  | Identify acute and obtuse angles and compare and order angles up to two right angles by size.  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. | Describe positions on a 2-D grid as coordinates in the first quadrant.  Describe movements between positions as translations of a given unit to the left/right and up/down.  Plot specified points and draw sides to complete a given polygon. |
| **Year 5** | 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, including cubes and  other cuboids, 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 | Identify, describe and represent the  position of a shape following a  ref lection or translation, using the appropriate language, and know that the shape has not changed. |
| **Year 6** | Draw2-D shapes using given dimensions and angles.  Compare and classify geometric shapes based on their properties and sizes.  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. | Find unknown angles in any triangles, quadrilaterals, and regular polygons.  Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. | 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. |

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| **Statistics** | | |
|  | **Present and Interpret** | **Solve Problems** |
| **Year 1** |  |  |
| **Year 2** | 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. |
| **Year 3** | Interpret and present data using bar charts, pictograms and tables | Solve one-step and two-step questions using information presented in scaled bar charts and pictograms and tables. |
| **Year 4** | 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 bar charts, pictograms, tables and other graphs. |
| **Year 5** | Complete, read and interpret information in tables, including timetables. | Solve comparison, sum and difference problems using information presented in a line graph. |
| **Year 6** | Interpret and construct pie charts and line graphs and use these to solve problems.  Calculate and interpret the mean as an average. | |