## MATHS PROGRAMME OF STUDY

| Year 1 | Objectives |
| :---: | :---: |
| Number \& Place Value | - Read and write numbers from 1 to 20 in numerals and words <br> - Count, read and write numbers to 100 in numerals <br> - Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number <br> - Count in multiples of $2 \mathrm{~s}, 5 \mathrm{~s}$ and 10 s <br> - Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least <br> - Identify 1 more and 1 less of a given number |
|  <br> Subtraction | - Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs <br> - Add and subtract one-digit and two-digit numbers to 20 , including 0 <br> - Represent and use number bonds and related subtraction facts within 20 <br> - Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7=$ ? -9 . |
| Multiplication \& Division | - 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 |
| Fractions | - Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity <br> - Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity |
| Measures | - Compare, describe and solve practical problems for: <br> - lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] <br> - mass/weight [for example, heavy/light, heavier than, lighter than] <br> - capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] time [for example, quicker, slower, earlier, later] <br> - Measure and begin to record the following: lengths and heights mass/weight capacity and volume time (hours, minutes, seconds) <br> - Recognise and know the value of different denominations of coins and notes <br> - Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] <br> - Recognise and use language relating to dates, including days of the week, weeks, months and years <br> - Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times |
| Geometry | - Recognise and name common 2-D, for example, squares, rectangles, circles and triangles. <br> - Recognise and name common 3-D shapes, for example, cubes, cuboids, pyramids and spheres <br> - Can describe position, direction and movement, including whole, half, quarter and three-quarter turns |


| Year 2 | Objectives |
| :---: | :---: |
| Number \& Place Value | - Read and write numbers to at least 100 in numerals and in words <br> - Compare and order numbers from 0 up to 100; use <, > and = signs <br> - Recognise the place value of each digit in a two-digit number (10s, 1s) <br> - Count in steps of 2,3 , and 5 from 0 , and in 10 s from any number, forward and backward <br> - Identify, represent and estimate numbers using different representations, including the number line <br> - Use place value and number facts to solve problems |
| Addition \& Subtraction | - Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures <br> - Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 <br> - Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and 1 s a two-digit number and 10s 2 two-digit numbers adding 3 one-digit numbers <br> - Show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot <br> - Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems |
| Multiplication \& Division | - Recall and use multiplication and division facts for the 2,3 and 5 multiplication tables, including recognising odd and even numbers*** <br> - Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication $(\times)$, division ( $\div$ ) and equals (=) signs <br> - Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot <br> - Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts |
| Fractions | - 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 <br> - Write simple fractions, for example $\frac{1}{2}$ of $6=3$ and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ |
| Measures | - Choose and use appropriate standard units to estimate and measure length/height in any direction ( $\mathrm{m} / \mathrm{cm}$ ); mass (kg/g); temperature ( ${ }^{\circ} \mathrm{C}$ ); capacity (litres $/ \mathrm{ml}$ ) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels <br> - Compare and order lengths, mass, volume/capacity and record the results using >, < and = <br> - Recognise and use symbols for pounds ( $£$ ) and pence ( $p$ ); combine amounts to make a particular value <br> - Find different combinations of coins that equal the same amounts of money <br> - Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change <br> - Compare and sequence intervals of time <br> - 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 <br> - Know the number of minutes in an hour and the number of hours in a day |
| Geometry | - Identify and describe the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line <br> - Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces <br> - Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] |


| Year 3 |  |
| :---: | :---: |
| Number \& Place Value | - Read and write numbers up to 1,000 in numerals and in words <br> - Compare and order numbers up to 1,000 <br> - Count from 0 in multiples of $4,8,50$ and 100 <br> - Find 10 or 100 more or less than a given number <br> - Recognise the place value of each digit in a 3-digit number (100s, 10s, 1s) <br> - Identify, represent and estimate numbers using different representations |
| Addition \& Subtraction | - Add and subtract numbers mentally, including: a three-digit number and 1s, a three-digit number and 10s, a three-digit number and 100s <br> - Estimate the answer to a calculation and use inverse operations to check answers <br> - Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction (HTO + HTO, HTO + TO, TO + TO, HTO-HTO, HTO - TO) <br> - Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction |
| Multiplication \& Division | - Recall and use multiplication and division facts for the 4,6 , and 9 multiplication tables*** <br> - Write and calculate mathematical statements for multiplication, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (grid/short multiplication) <br> - Write and calculate mathematical statements for division, including for two-digit numbers divided by one-digit numbers, using mental and progressing to formal written methods (short division) <br> - 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 |
| Fractions | - Count up and down in tenths; I recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 <br> - Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators <br> - Recognise and show, using diagrams, equivalent fractions with small denominators <br> - Add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7}+\frac{1}{7}=\frac{6}{7}$ ] <br> - Compare and order unit fractions, and fractions with the same denominators |
| Measures | - Measure, compare, add and subtract: lengths ( $\mathrm{m} / \mathrm{cm} / \mathrm{mm}$ ); mass ( $\mathrm{kg} / \mathrm{g}$ ); volume/capacity ( $\mathrm{l} / \mathrm{ml}$ ) <br> - Measure the perimeter of simple 2-D shapes <br> - Add and subtract amounts of money to give change, using both $£$ and $p$ in practical contexts <br> - Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks <br> - 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, am/pm, morning, afternoon, noon and midnight <br> - Know the number of seconds in a minute and the number of days in each month, year and leap year <br> - Compare durations of events [for example, to calculate the time taken by particular events or tasks] |
| Geometry | - Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them. <br> - Recognise angles as a property of shape or a description of a turn |


| Year 4 | Objectives |
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| Number \& Place Value | - Count in multiples of $6,7,9,25$ and 1,000 <br> - Find 1,000 more or less than a given number <br> - Count backwards through 0 to include negative numbers <br> - Recognise the place value of each digit in a four-digit number ( $1,000 \mathrm{~s}, 100 \mathrm{~s}, 10 \mathrm{~s}$, and 1 s ) <br> - Order and compare numbers beyond 1,000 <br> - Round any number to the nearest 10,100 or 1,000 <br> - Solve number and practical problems that involve all of the above and with increasingly large positive numbers <br> - Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value |
|  <br> Subtraction | - Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate <br> - Estimate and use inverse operations to check answers to a calculation <br> - Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why |
| Multiplication \& Division | - Recall multiplication and division facts for $7 x, 8 x, 11 x$ and $12 x$ multiplication tables <br> - Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1 ; dividing by 1 ; multiplying together 3 numbers <br> - Recognise and use factor pairs and commutativity in mental calculations <br> - Multiply two-digit and three-digit numbers by a one-digit number using formal written layout <br> - Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects |
| Fractions | - Recognise and show, using diagrams, families of common equivalent fractions <br> - Count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10 <br> - Add and subtract fractions with the same denominator <br> - Recognise and write decimal equivalents of any number of tenths or hundreds <br> - Recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ <br> - 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 <br> - Know 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 <br> - Round decimals with 1 decimal place to the nearest whole number <br> - Compare numbers with the same number of decimal places up to 2 decimal places <br> - Solve simple measure and money problems involving fractions and decimals to 2 decimal places |
| Measures | - Convert between different units of measure [for example, kilometre to metre; hour to minute] <br> - Measure and calculate the perimeter of a rectilinear figure (including squares) in cm and m <br> - Find the area of rectilinear shapes by counting squares <br> - Estimate, compare and calculate different measures, including money in pounds and pence <br> - Read, write and convert time between analogue and digital 12- and 24-hour clocks |


|  | - Solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days |
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| Geometry | - Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes |
|  | - Identify acute and obtuse angles and compare and order angles up to 2 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 |
|  | - 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 | - 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 | Objectives |
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| Number \& Place Value | - Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit <br> - Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 <br> - Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0 <br> - Round any number up to $1,000,000$ to the nearest $10,100,1,000,10,000$ and 100,000 <br> - Read Roman numerals to $1,000(\mathrm{M})$ and recognise years written in Roman numerals |
| Addition \& Subtraction | - Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) <br> - Add and subtract numbers mentally with increasingly large numbers <br> - Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy <br> - Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why |
| Multiplication \& Division | - Recall multiplication and division facts for decimal tables ( $0 . t \times 0$ ) multiplication tables e.g. $7 \times 0.4^{* * *}$ <br> - Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 number <br> - Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers <br> - Establish whether a number up to 100 is prime and recall prime numbers up to 19 <br> - 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 <br> - Multiply and divide numbers mentally, drawing upon known facts <br> - 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 <br> - Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000 <br> - Recognise and use square numbers and cube numbers, and the notation for squared $\left({ }^{2}\right)$ and cubed $\left({ }^{3}\right)$ <br> - Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates |
| Fractions | - Compare and order fractions whose denominators are all multiples of the same number <br> - Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths <br> - Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements $>1$ as a mixed number <br> - Add and subtract fractions with the same denominator, and denominators that are multiples of the same number <br> - Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams <br> - Read and write decimal numbers as fractions <br> - Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents <br> - Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place <br> - Read, write, order and compare numbers with up to 3 decimal places <br> - Solve problems involving number up to 3 decimal places <br> - Recognise the per cent symbol (\%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction <br> - Solve problems which require knowing percentage and decimal equivalents and those fractions with a denominator of a multiple of 10 or 25 |


| Measures | - Convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre] <br> - Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints <br> - Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres <br> - Calculate and compare the area of rectangles (including squares), including using standard units, square centimetres ( $\mathrm{cm}^{2}$ ) and square metres $\left(\mathrm{m}^{2}\right)$, and estimate the area of irregular shapes <br> - Estimate volume [for example, using $1 \mathrm{~cm}^{3}$ blocks to build cuboids (including cubes)] and capacity [for example, using water] <br> - Solve problems involving converting between units of time <br> - Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling |
| :---: | :---: |
| Geometry | - Identify 3-D shapes, including cubes and other cuboids, from 2-D representations <br> - Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angle <br> - Draw given angles, and measure them in degrees ( ${ }^{\circ}$ ) <br> - Identify: angles at a point and 1 whole turn (total $360^{\circ}$ ), angles at a point on a straight line and half a turn (total $180^{\circ}$ ), other multiples of $90^{\circ}$, use the properties of rectangles to deduce related facts and find missing lengths and angles. <br> - Distinguish between regular and irregular polygons based on reasoning about equal sides and angles <br> - 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 | - Solve comparison, sum and difference problems using information presented in a line graph <br> - Complete, read and interpret information in tables, including timetables |


| Year 6 | Objectives |
| :---: | :---: |
| Number \& Place Value | - Read, write, order and compare numbers up to $10,000,000$ and determine the value of each digit <br> - Round any whole number to a required degree of accuracy <br> - Use negative numbers in context, and calculate intervals across 0 |
| Addition, Subtraction, Multiplication \& Division | - Recall multiplication and division facts for decimal tables (O.t x O.t) multiplication tables e.g. $0.7 \times 0.4^{* * *}$ <br> - Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication <br> - 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 <br> - 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 <br> - Perform mental calculations, including with mixed operations and large numbers <br> - Identify common factors, common multiples and prime numbers <br> - Use my knowledge of the order of operations to carry out calculations involving the 4 operations <br> - Solve problems involving addition, subtraction, multiplication and division <br> - Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy |
| Fractions | - Use common factors to simplify fractions; use common multiples to express fractions in the same denomination <br> - Compare and order fractions, including fractions >1 <br> - Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions <br> - Multiply simple pairs of proper fractions, writing the answer in its simplest form <br> - Divide proper fractions by whole numbers <br> - Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction <br> - Identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places <br> - Multiply one-digit numbers with up to 2 decimal places by whole numbers <br> - Use written division methods in cases where the answer has up to 2 decimal places <br> - Solve problems which require answers to be rounded to specified degrees of accuracy <br> - Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts |
| Ratio and Proportion | - Solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts <br> - Solve problems involving the calculation of percentages [for example, of measures and such as $15 \%$ of 360 ] and the use of percentages for comparison <br> - Solve problems involving similar shapes where the scale factor is known or can be found <br> - Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples |
| Algebra | - Use simple formulae <br> - Generate and describe linear number sequences <br> - Express missing number problems algebraically <br> Find pairs of numbers that satisfy an equation with 2 unknowns <br> - Enumerate possibilities of combinations of 2 variables |
| Measures | - Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 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 to up to 3 decimal places <br> - Convert between miles and kilometres <br> - Recognise that shapes with the same areas can have different perimeters and vice versa <br> - Recognise when it is possible to use formulae for area and volume of shapes <br> - Calculate the area of parallelograms and triangles <br> - Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres ( $\mathrm{cm}^{3}$ ) and cubic metres ( $\mathrm{m}^{3}$ ), and extending to other units [for example, $\mathrm{mm}^{3}$ and $\mathrm{km}^{3}$ ] |
| :---: | :---: |
| Geometry | - Draw 2-D shapes using given dimensions and angles <br> - Recognise, describe and build simple 3-D shapes, including making nets <br> - Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygon <br> - Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius <br> - Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles <br> - Describe positions on the full coordinate grid (all 4 quadrants) <br> - Draw and translate simple shapes on the coordinate plane, and reflect them in the axes |
| Statistics | - Interpret and construct pie charts and line graphs and use these to solve problems <br> - Calculate and interpret the mean as an average |

