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Maths progression document

|  | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Counting | - count to and across 100, forwards and backwards, beginning with 0 or 1 , or from any given number <br> - count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens | - count in steps of 2, 3, and 5 from 0 , and in tens from any number, forward and backward | - count from 0 in multiples of $4,8,50$ and 100 ; find 10 or 100 more or less than a given number. | - count in multiples of 6, 7, 9, 25 and 1000 <br> - find 1000 more or less than a given number count backwards through zero to include negative numbers | - count forwards or backwards in steps of powers of 10 for any given number up to 1000000 <br> - interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero | - use negative numbers in context, and calculate intervals across zero |
| Place Value |  | -recognise the place value of each digit in a two-digit number <br> - compare and order numbers from 0 up to 100; use <, > and = signs | - recognise the place value of each digit in a three-digit number - compare and order numbers up to 1000 | - recognise the place value of each digit in a four-digit number <br> - order and compare numbers beyond 1000 <br> - round any number to the nearest 10,100 or 1000 | -read, write, order and compare numbers up to 1 000000 and determine the value of each digit - round any number up to 1 000000 to the nearest 10 , $100,1000,10000$ and 100 000 | -read, write, order and compare numbers up to 10000000 and determine the value of each digit - round any whole number to a required degree of accuracy |
| Representing number | - identify and represent numbers using objects and pictorial representations including the number line, \& use language of: equal to, more than, less than (fewer), most, least -read and write numbers from 1 to 20 in numerals and words -read, write and interpret mathematical statements involving addition ( + ), subtraction (-) and equals (=) signs | -identify, represent and estimate numbers using different representations, including the number line - read and write numbers to at least 100 in numerals and in words | -identify, represent and estimate numbers using different representations - read and write numbers up to 1000 in numerals and in words | -identify, represent and estimate numbers using different representations -read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value | -read Roman numerals to 1000 (M) and recognise years written in Roman numerals <br> -recognise and use square numbers and cube numbers, and the notation for squared ( ${ }^{2}$ ) and cubed ${ }^{(3)}$ |  |

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- use place value and number facts to solve problems
recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 - add and subtract numbers using concrete objects, pictorial representations, and mentally, including: TU+U $\mathrm{T}+\mathrm{T}, \mathrm{TU}+\mathrm{TU}$ and $\mathrm{U}+\mathrm{U}+\mathrm{U}$ - show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot


## Written +/-

one more and one less
-represent and use number bonds and related subtraction facts within 20

| Number facts (+/-) | - given a number, identify one more and one less - represent and use number bonds and related subtraction facts within 20 | - use place value and number facts to solve problems recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Mental +/- | - add and subtract onedigit and two-digit numbers to 20 , including zero | - add and subtract numbers using concrete objects, pictorial representations, and mentally, including: TU+U, $T U+T, T U+T U$ and $U+U+U$ <br> - show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot | - add and subtract numbers mentally, including: $\mathrm{HTU}+\mathrm{U}, \mathrm{HTU}+\mathrm{T}$ and $\mathrm{HTU}+\mathrm{H}$ |  | - add and subtract numbers mentally with increasingly large numbers | - perform mental calculations, including with mixed operations and large numbers |
| Written +/- |  |  | - add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction | - add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate | - add and subtract whole numbers with more than 4 digits, including using formal written methods |  |
| Problems +/- | - solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7=\square$ - 9 . | - solve problems with addition and subtraction, using concrete, pictorial and abstract representations -recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. | - estimate the answer to a calculation and use inverse operations to check answers <br> - solve problems, <br> including missing number problems, using number facts, place value, and more complex addition and subtraction | - 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 | - 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 |  |
| Number facts ( $\mathbf{x} / \div$ ) |  | -recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers | -recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables | - recall multiplication and division facts for multiplication tables up to $12 \times 12$ | -identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers <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 | -identify common factors, common multiples and prime numbers |

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|  |  |  |  |  | and recall prime numbers up to 19 |  |
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| Mental (x/ $\div$ ) |  | - calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication $(x)$, division ( $\div$ ) and equals (=) signs <br> - show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot | - write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods | - 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 <br> - recognise and use factor pairs and commutativity in mental calculations | - multiply and divide numbers mentally drawing upon known facts <br> - multiply and divide whole numbers and those involving decimals by 10 , 100 and 1000 | - perform mental calculations, including with mixed operations and large numbers |
| Written ( $\mathrm{x} / \div$ ) |  |  | - Progress to formal written methods calculations as above | -multiply two-digit and three-digit numbers by a one-digit number using formal written layout | - multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for twodigit numbers <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 | - 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 context |
| Problems $(x / \div)$ | -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. | -solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts | - solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which $n$ | -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 | -solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes <br> - solve problems involving addition, subtraction, | - use their knowledge of the order of operations to carry out calculations involving the four operations <br> - solve addition and subtraction multi-step problems in contexts, |

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|  |  |  | objects are connected to m objects. | such as n objects are connected to mobjects | 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 | deciding which operations and methods to use and why <br> -solve problems involving addition, subtraction, multiplication and division - use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy |
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| Recognising fractions | - recognise, 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. | - recognise, find, name and write fractions $1 / 3,1 / 4,2 / 4$ and $3 / 4$ of a length, shape, set of objects or quantity | - count up and down in tenths; <br> - recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 | - count up and down in hundredths; <br> -recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. | -recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number |  |
| Comparing fractions |  |  | - compare and order unit fractions, and fractions with the same denominators <br> - recognise and show, using diagrams, equivalent fractions with small denominators | - recognise and show, using diagrams, families of common equivalent 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 | - use common factors to simplify fractions <br> - use common multiples to express fractions in the same denomination - compare and order fractions, including fractions > 1 |
| Finding fractions of quantities |  |  | - 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 | - solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including nonunit fractions where the answer is a whole number |  |  | Salisbury Manor Primary School The best in everyone ${ }^{\prime \prime \prime}$


| Fraction calculations |  | - write simple fractions for example, $1 / 2$ of $6=3$ and recognise the equivalence of $2 / 4$ and $1 / 2$. | - add and subtract fractions with the same denominator within one whole [for example, 5/7 + $1 / 7=6 / 7$ ] | - add and subtract fractions with the same denominator | - add and subtract fractions with the same denominator and denominators that are multiples of the same number <br> - multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams | - 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 |
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| Decimals as fractional amounts |  |  |  | - recognise and write decimal equivalents of any number of tenths or hundredths <br> -recognise and write decimal equivalents to $1 / 4,1 / 2$ and $3 / 4$ <br> - 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 | - read and write decimal numbers as fractions | - associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction <br> -identify the value of each digit in numbers given to three decimal places |
| Ordering decimals |  |  |  | -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 | - 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 |  |
| $\begin{aligned} & \text { Calculating } \\ & \text { with } \\ & \text { decimals } \end{aligned}$ |  |  |  |  |  | - multiply and divide numbers by 10,100 and 1000 giving answers up to three decimal places <br> - multiply one-digit number with up to two decimal places by whole numbers <br> - use written division methods in cases where |

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|  |  |  |  |  |  | the answer has up to two decimal places |
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| Percentages |  |  |  |  | - 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 the calculation of percentages [for example, of measures, and such as $15 \%$ of 360 ] and the use of percentages for comparison |
| Fraction problems |  |  | - solve problems using all fraction knowledge | - solve simple measure and money problems involving fractions and decimals to two decimal places | -solve problems involving number up to three decimal places <br> - solve problems which require knowing percentage and decimal equivalents of $1 / 2,1 / 4,1 / 5$, $2 / 5,4 / 5$ and those fractions with a denominator of a multiple of 10 or 25 | -solve problems which require answers to be rounded to specified degrees of accuracy -recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. |
| Ratio \& Proportion |  |  |  |  |  | -solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts <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 - express missing number problems algebraically <br> - find pairs of numbers that satisfy an equation with two unknowns |

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|  |  |  |  |  |  | - enumerate possibilities of combinations of two variables. |
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| Measures | - compare, describe and solve practical problems for: length/height, weight/mass, capacity/volume \& time - measure and begin to record length/height, weight/mass, capacity/volume \& time | - choose and use appropriate standard units to estimate and measure length/height (m/cm); mass (kg/g); temperature ( ${ }^{\circ} \mathrm{C}$ ); capacity (litres/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 $=$ | -measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) | - Convert between different units of measure estimate, compare and calculate different measures, including money in pounds and pence | - convert between different units of metric measure <br> - understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints <br> - estimate volume and capacity | - solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate <br> - 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 three decimal places convert between miles and kilometres |
| Mensuration |  |  | -measure the perimeter of simple 2-D shapes | - measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres find the area of rectilinear shapes by counting squares | - 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 $\left(\mathrm{cm}^{2}\right)$ and square metres $\left(m^{2}\right)$ and estimate the area of irregular shapes | -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 (cm3) and cubic metres (m3), and extending to other units. |

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| Money | - recognise and know the value of different denominations of coins and notes | -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 | - add and subtract amounts of money to give change, using both £ and $p$ in practical contexts |  | - use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Time | - sequence events in chronological order using language 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 | - 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 - know the number of minutes in an hour and the number of hours in a day | -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, a.m./p.m., 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 compare durations of events | - Convert between different units of measure (e.g. Hours to minutes) <br> -read, write and convert time between analogue and digital 12 - and 24 -hour clocks <br> - solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days | -solve problems involving converting between units of time |  |
| Shape vocabulary | -recognise and name common 2-D shapes (e.g. Square, circle, triangle) <br> -recognise and name common 3-D shapes (e.g. Cubes, cuboids, pyramids \& spheres) | (vertices, edges, faces, symmetry) | - identify horizontal and vertical lines and pairs of perpendicular and parallel lines |  |  | - illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius |
| Properties of 2-d shape |  | -identify and describe the properties of 2-D shapes, including the number of sides | - draw 2-D shapes | - compare and classify geometric shapes, including quadrilaterals and triangles, | - use the properties of rectangles to deduce | - draw 2-D shapes using given dimensions and angles |

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|  |  | and line symmetry in a vertical line. <br> - compare and sort common <br> 2-D and 3-D shapes and everyday objects. |  | based on properties and sizes <br> - identify lines of symmetry in 2-D shapes presented in different orientations <br> - complete a simple symmetric figure with respect to a specific line of symmetry. | related facts and find missing lengths and angles <br> - distinguish between regular and irregular polygons based on reasoning about equal sides and angles. | compare and classify geometric shapes based on their properties and sizes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Properties of 3-d shape |  | - 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. compare and sort common 2-D and 3-D shapes and everyday objects. | -make 3-D shapes using modelling materials recognise 3-D shapes in different orientations and describe them |  | -identify 3-D shapes, including cubes and other cuboids, from 2-D representations | -recognise, describe and build simple 3-D shapes, including making nets - find unknown angles in any triangles, quadrilaterals, and regular polygons |
| Angles |  |  | - recognise angles as a property of shape or a description of a turn <br> - identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn <br> - identify whether angles are greater or less than right angle | -identify acute and obtuse angles and compare and order angles up to two right angles by size | - know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles <br> - draw given angles, and measure them in degrees $\left({ }^{\circ}\right)$ <br> - identify angles at a point and one whole turn (total $360^{\circ}$; at a point on a straight line and $1 / 2$ a turn (total $180^{\circ}$ ) <br> - identify other multiples of $90^{\circ}$ | - recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles |
| Position \& Direction | - describe position, direction and movement, including whole, half, quarter and threequarter turns. | - order and arrange combinations of mathematical objects in patterns and sequences. <br> - 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 $3 / 4$ turns |  | - describe positions on a 2-D grid as coordinates in the first quadrant <br> - 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 | -identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed | - describe positions on the full coordinate grid (all four quadrants) <br> - draw and translate simple shapes on the coordinate plane, and reflect them in the axes. | Salisbury Manor Primary School The best in everyone" Wathamstow Primary Academy The best in everyone"


| Interpreting data |  | -interpret and construct simple pictograms, tally charts, block diagrams and simple tables | - interpret and present data using bar charts, pictograms and tables | -interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs | - complete, read and interpret information in tables, including timetables | - interpret and construct pie charts and line graphs calculate and interpret the mean as an average |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Extract info from data |  | - ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity <br> - ask and answer questions about totalling and comparing categorical data | - solve one-step and twostep questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables | -solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs | - solve comparison, sum and difference problems using information presented in a line graph | - use pie charts and line graphs to solve problems |

