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| Mathematics in the Early Years Foundation StageNumber  * Subitise. * Automatically recall number bonds for numbers 0-10.   ***Early Learning Goals:***   * *Have a deep understanding of number to 10, including the composition of each number.* * *Subitise (recognise quantities without counting) up to 5.* * *Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.*   **Numerical Patterns**   * Count objects, actions and sounds. * Link the number symbol (numeral) with its cardinal number value. * Count beyond ten. * Compare numbers. * Understand the ‘one more than/ one less than’ relationship between consecutive numbers. * Explore the composition of numbers to 10. * Select, rotate and manipulate shapes in order to develop spatial reasoning skills. * Compose and decompose shapes so that I can recognise that a shape can have other shapes within it, just as numbers can. * Continue, copy and create repeating patterns. * Compare length, weight and capacity. * ***Early Learning Goals:*** * *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.* | | | | | | |
|  | **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** * **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 * 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 1 000 000 * 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** * **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 * order and compare numbers beyond 1000 * round any number to the nearest 10, 100 or 1000 | * read, write, order and compare numbers up to 1 000 000 and determine the value of each digit * round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 | * read, write, 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 |
| **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** * **recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)** |  |
| **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 one-digit and two-digit numbers to 20, including zero** | * add and subtract numbers using concrete objects, pictorial representations, and mentally, including: TU+U, TU+T, TU+TU and U+U+U * 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: HTU+U,**  **HTU+T and HTU+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 = □ – 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 * solve problems, 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 * solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why | • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why |  |
| **Number facts**  **(x/÷)** |  | **• 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 × 12** | * **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** | • identify common factors, common multiples and prime numbers |
| **Mental (x/÷)** |  | * calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs * 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 • recognise and use factor pairs and commutativity in mental calculations** | * multiply and divide numbers mentally drawing upon known facts * 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 (x/÷)** |  |  | • Progress to formal written methods calculations as above | **• multiply two-digit and three-digit numbers by a onedigit number using formal written layout** | * **multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers** * **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 * 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 * 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 |

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|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Problems (x/÷)** | • 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 objects are connected to m objects. | • 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 | * 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 | * 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 * 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 |
| **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;** * **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;** * **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** * **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** * **identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths** | * **use common factors to simplify fractions** * **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 non-unit fractions where the answer is a whole number |  |  |
| **Calculating with fractions** |  | **• 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 • 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** * **multiply simple pairs of proper fractions, writing the answer in its simplest form** * **divide proper fractions by whole numbers** |
| **Decimals as fractional**  **amounts** |  |  |  | * **recognise and write decimal equivalents of any number of tenths or hundredths** * **recognise and write decimal equivalents to ¼, ½ and ¾** * **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 • 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 |  |
| **Calculating with decimals** |  |  |  |  |  | * multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places * multiply one-digit number with up to two decimal places by whole numbers * use written division methods in cases where the answer has up to two decimal places |
| **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 * 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 | * 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 • 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.** |

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|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **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. |
| **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 (°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 = | **• 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 * understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints * 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 * 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 (cm²) and square metres (m²) and estimate the area of irregular shapes | * recognise that shapes with the same areas can have different perimeters and vice versa * 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. |
| **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 * 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 | **• 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** * **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 * 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 * 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 | * Convert between different units of measure (e.g. Hours to minutes) * 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 | • solve problems involving converting between units of time |  |
| **Shape vocabulary** | * **recognise and name common 2-D shapes (e.g. Square,**   **circle, triangle)**   * **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 and line symmetry in a vertical line. • compare and sort common 2-D and 3-D shapes and everyday objects. | • draw 2-D shapes | * compare and classify geometric shapes, including quadrilaterals and triangles, based on 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. | * **use the properties of rectangles to deduce related facts and find missing lengths and angles** * **distinguish between regular and irregular polygons based on reasoning about equal sides and angles.** | • draw 2-D shapes using given dimensions 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 * 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 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** * **draw given angles, and measure them in degrees (°)** * **• identify angles at a point and one whole turn (total**   **360°); at a point on a straight line and ½ a turn (total 180°)**   * **identify other multiples of 90°** | **• recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles** |

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|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Position & Direction** | • describe position, direction and movement, including whole, half, quarter and three-quarter turns. | * 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 ¾ turns |  | * 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 | **• 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) * draw and translate simple shapes on the coordinate plane, and reflect them in the axes. |
| **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 * ask and answer questions about totalling and comparing categorical data | • solve one-step and two-step questions [for example, ‘How many more?’ and ‘How many fewer?’] using information presented in scaled bar charts and pictograms and tables | • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs | • solve comparison, sum and difference problems using information presented in a line graph | • use pie charts and line graphs to solve problems |