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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.*
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|  | **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
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| **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)**
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| **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
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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;**
* **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**
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| **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**
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| **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
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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
* 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.
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| **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.
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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 (°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
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| **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.
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| **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 |