|  | n Gate Kno | ledge and s | Is progressi | on in Math |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | EYFS | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| Number \& Place Value | Can count to 20 in a range of situations and using a range of strategies, including forwards and backwards, starting at different points. <br> Explore and represent patterns within numbers up to 10 , including evens and odds, double facts and how quantities can be distributed equally. | Count to and across 100, forwards and backwards, beginning from 0,1 or any given number <br> Count in multiples of 2, 5 and 10 <br> Count forwards and backwards through the odd numbers | Count in steps of 2, 3 and 5 from 0 <br> Count in tens from any number, forward and backward | Count from 0 in multiples of $4,8,50$ and 100 | Count in multiples of $6,7,9,25$ and 100 | Count forwards or backwards in steps of powers of 10 for any given number up to 1000000 |  |
|  |  |  |  |  | Count backwards through zero to include negative numbers | Interpret negative numbers in context <br> Count forwards and backwards with positive and negative whole numbers, including through zero | Use negative numbers in context and calculate intervals across 0 |


|  |  | Read and write numbers to 100 in numerals Read and write numbers to 20 in words | Read and write numbers to at least 100 in numerals and words | Read and write numbers up to 1000 in numerals and words | 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 and write numbers to 1000000 Read Roman numerals to 1000 (M) and recognise years written in Roman numerals | Read and write numbers up to 10000000 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Recognise the place value of each digit in two-digit numbers | Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) | Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) | Recognise the place value of each digit in numbers with up to 2 decimal places. <br> Determine the value of each digit in numbers to 1000000 | Determine the value of each digit in numbers to 10000 000 , including decimal fractions |
|  |  |  |  | Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10 ; apply this to identify and work out how many 10s there are in other three-digit multiples of 10 . | Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100 ; apply this to identify and work out how many 100s there are in other four-digit multiples of 100. | Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. <br> Know that 100 <br> hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01 . Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01 . | Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10 , 100 and 1,000 ). |



|  | Can understand sequence and order of numbers 0-10 | Reason about the location of numbers to 20 within the linear number system | Reason about the location of any twodigit number in the linear number system, including identifying the previous and next multiple of 10 . | Reason about the location of any threedigit number in the linear number system, including identifying the previous and next multiple of 100 and 10. | Reason about the location of any fourdigit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100 | Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 | Reason about the location of any number up to 10 million in the linear number system |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Round any number to the nearest 10,100 or 1000 | Round any number up to 1000000 to the nearest 10,100 , 1000, 10000 and 100 000 | Round any whole number to a required degree of accuracy |
|  | Begin to use the language of more than, fewer than | Use the language of: equal to, more than, less than (fewer), most, least | Compare and order numbers from 0 up to 100; use $<,>$ and $=$ signs | Compare and order numbers up to 1000 | Compare and order numbers beyond 1000 | Compare and order numbers to 1000000 | Compare and order numbers up to 10000000 |
|  |  |  | Use place value and number facts to solve problems | Solve number problems and practical problems involving these ideas | Solve number and practical problems that involve all of the above and with increasingly large positive numbers | Solve number problems and practical problems that involve all of the above | Solve number and practical problems that involve all of the above |
| Addition \& Subtraction |  | Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs | Recognise the subtraction structure of 'difference' and answer questions of the form, <br> "How many more...?". | Add and subtract numbers with up to three digits using columnar methods | Add and subtract numbers with up to 4 digits using columnar methods | Add and subtract whole numbers with more than 4 digits using columnar methods | Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding. |


|  | Can independently subitise all numbers 0-10 <br> Can show understanding of cardinality and composition of 0-10 in their work and play. | Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers. | Add and subtract across 10 | Calculate complements to 100 |  |  | Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number). |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Can show understanding of cardinality and composition of 0-10 in their work and play. <br> Can begin to use a tens frame to explore numbers 0-10 | Develop fluency in addition and subtraction facts within 10. | Secure fluency in addition and subtraction facts within 10 , through continued practice. | Secure fluency in addition and subtraction facts that bridge 10, through continued practice. |  |  |  |
|  |  | Represent and use number bonds and related subtraction facts within 20 | Recall and use addition and subtraction facts to 20 fluently |  |  |  |  |



|  |  |  | Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot | Understand and use the commutative property of addition, and understand the related property for subtraction. |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 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: <br> -Using concrete objects and pictorial representations, including those involving numbers, quantities and measures <br> -By applying their increasing knowledge of mental and written methods <br> Solve missing number problems | Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction | Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why | Solve addition and subtraction multistep problems in contexts, deciding which methods to use and why | Solve addition and subtraction multistep problems in contexts, deciding which operations and methods to use and why <br> Solve problems involving addition, subtraction, multiplication and division |
| Multiplication \& Division |  |  | Calculate mathematical statements for multiplication and division within the | Write and calculate mathematical statements for multiplication and division using the |  |  | Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and |


|  |  |  | multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals (=) signs | multiplication tables that they know, including for twodigit numbers times one-digit numbers, using mental and progressing to formal written methods |  |  | multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number). Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division). <br> Show that multiplication of two numbers can be done in any order |  | Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication. <br> Recognise and use factor pairs and commutativity in mental calculations | Identify multiples <br> Identify factors <br> Find all factors pairs of a number and common factors of two numbers <br> Express a given number as a product of 2 or 3 factors. |  |




|  |  |  | 2, 5 and 10 times tables | 3, 4 and 8 times tables |  | division facts, through continued practice. |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Recognise odd and even numbers |  | 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 | Multiply and divide numbers mentally drawing upon known facts | Perform mental calculations, including with mixed operations and large numbers |
|  |  |  | Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables. | Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division. | Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. | Multiply and divide whole numbers by 10,100 and 1000 , understand this is equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size. | Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10,100 and 1,000 ). |
|  |  |  |  | Apply place value knowledge to known additive and multiplicative facts (scaling by 10 ) | Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100) | Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth). |  |


|  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |



|  |  |  |  |  | hundred and dividing tenths by ten |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 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 <br> Add and subtract fractions with denominators that are multiples of the same number <br> Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers. <br> Recall decimal fraction equivalents for a half, quarter, fifth and tenth, and for multiples of these proper fractions | Add and subtract fractions with different denominators <br> Add and subtract mixed numbers |
|  |  |  |  |  |  | Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams | Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $1 / 4 \times 1 / 2=$ 1/8] |




$\left.\begin{array}{|l|l|l|l|l|l|l|}\hline & & & & & \begin{array}{l}\text { Compare numbers } \\ \text { with the same } \\ \text { number of decimal } \\ \text { places up to two } \\ \text { decimal places }\end{array} \\ \hline & & & & \begin{array}{l}\text { Compare and order } \\ \text { numbers with up to } \\ \text { three decimal places }\end{array} \\ \hline & & & & & \begin{array}{l}\text { Add and subtract } \\ \text { numbers with up to } 3 \\ \text { decimal places }\end{array} \\ \hline & & & & & \begin{array}{l}\text { Multiply one-digit } \\ \text { numbers with up to } \\ \text { two decimal places } \\ \text { by whole numbers }\end{array} \\ \text { Unse written division } \\ \text { methods in cases } \\ \text { where the answer } \\ \text { has up to two } \\ \text { decimal places }\end{array}\right]$

|  |  |  |  |  |  | 4/5 and those fractions with a denominator of a multiple of 10 or 25 <br> Solve problems involving numbers up to three decimal places |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Measure | Can show an awareness of standard units of measure. <br> Can begin to compare and order by capacity, length, height and size | Measure and begin to record lengths and heights <br> Measure and begin to record mass and weight <br> Measure and begin to record capacity and volume | Choose and use appropriate standard units to estimate and measure length/height in any direction ( $\mathrm{m} / \mathrm{cm}$ ) using rulers <br> Choose and use appropriate standard units to estimate and measure mass (kg/g); temperature ( ${ }^{\circ} \mathrm{C}$ ); capacity (litres/ml) to the nearest appropriate unit, using scales, thermometers and measuring vessels | Measure, compare, add and subtract - <br> Lengths ( $\mathrm{m} / \mathrm{cm} / \mathrm{mm}$ ) <br> Mass (kg/g) <br> Volume/capacity <br> ( $1 / \mathrm{ml}$ ) |  |  |  |
|  |  |  |  |  | Convert between different units of measure: for | Convert between different units of metric measure (for example, kilometre | Use, read, write and convert between standard units |


|  |  |  |  |  | example, kilometre to metre | 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> Solve problems involving converting between units of time | Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate <br> Convert 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 <br> Convert between miles and kilometres |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Measure the perimeter of simple 2-D shapes | Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres | Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres |  |
|  |  |  |  |  | Find the area of rectilinear shapes by counting squares | Calculate the area of rectangles (including squares) and including standard units, square | Recognise that shapes with the same areas can have different perimeters and vice versa |


|  |  |  |  |  |  | centimetres (cm2) and square metres (m2) <br> Compare the area of rectangles (including squares) <br> Estimate the area of irregular shapes | Recognise when it is possible to use formulae for area and volume of shapes <br> Calculate the area of parallelograms <br> Calculate the area of triangles <br> Compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | Estimate volume [for example, using 1 cm 3 blocks to build cuboids (including cubes)] and capacity [for example, using water] | Calculate volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3] <br> Estimate volume of cubes and cuboids |


|  |  |  |  |  |  |  | Compare volume of cubes and cuboids |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Compare and order lengths <br> Compare and order mass <br> Compare and order volume/capacity |  |  |  |  |
|  |  | 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] |  |  |  | Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling |  |


|  | Can understand the purpose of money recognising coins and understanding about how change is given | Recognise and know the value of different denominations of coins and notes. | Recognise and use symbols for pounds <br> ( $£$ ) 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 | Solve simple measure and money problems involving fractions and decimals to two decimal places <br> Estimate, compare and calculate different measures, including money in pounds and pence |  |  |
|  | Can confidently talk about events in the past, present and future - showing an | Measure and begin to record time in seconds, minutes and hours |  | Record and compare time in terms of seconds, minutes and hours |  |  |  |
|  | progress of time. <br> To be able to sequence the days of the week. | Sequence events in chronological order using language [for example, before and after, next, first, | Know the number of minutes in an hour and the number of hours in a day | Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight |  |  |  |



|  |  |  |  |  | months; weeks to days |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Geometry | Can name some 2D and 3 D shapes. <br> Can use simple mathematical vocabulary to describes shapes. | Recognise and name common 2-D shapes presented in different orientations, including: rectangles (including squares), circles and triangles <br> Compose 2D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations. | Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line |  |  |  |  |
|  |  | Recognise and name common 3-D shapes presented in different orientations, including: cuboids (including cubes), pyramids and spheres] <br> Compose 3D shapes from smaller shapes to match an example, including <br> manipulating shapes to place them in | 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] | Recognise 3-D shapes in different orientations and describe them |  | Identify 3-D shapes, including cubes and other cuboids, from 2-D representations |  |



|  |  |  |  | Identify horizontal and vertical lines Identify pairs of perpendicular and parallel lines |  | Identify angles at a point on a straight line and $1 / 2$ a turn (total 180o) <br> Identify other multiples of 900 <br> 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 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Describe position, direction and movement, including whole, half, quarter and three-quarter turns | Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise) |  | 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 <br> Plot specified points and draw sides to | Identify and describe the position of a shape following a translation, using the appropriate language, and know that the shape has not changed <br> Represent the position of a shape following a translation, using the appropriate language, and know |  |


|  |  |  |  |  | complete a given polygon | that the shape has not changed <br> Identify and describe the position of a shape following a reflection, using the appropriate language, and know that the shape has not changed <br> Represent the position of a shape following a reflection, using the appropriate language, and know that the shape has not changed |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Order and arrange combinations of mathematical objects in patterns and sequences |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

