Progression in Mathematics

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|  | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Number – number and place value | * 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 * given a number, identify one more and one less * identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least * read and write numbers from 1 to 20 in numerals and words. | * count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward * recognise the place value of each digit in a two-digit number (tens, ones) * identify, represent and estimate numbers using different representations, including the number line * compare and order numbers from 0 up to 100; use <, > and = signs * read and write numbers to at least 100 in numerals and in words * use place value and number facts to solve problems | * count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number * recognise the place value of each digit in a three-digit number (hundreds, tens, ones) * compare and order numbers up to 1000 * identify, represent and estimate numbers using different representations * read and write numbers up to 1000 in numerals and in words * solve number problems and practical problems involving these ideas. | * 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 * recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) * order and compare numbers beyond 1000 * identify, represent and estimate numbers using different representations * round any number to the nearest 10, 100 or 1000 * solve number and practical problems that involve all of the above and with   increasingly large positive numbers   * 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, write, order and compare numbers to at least 1 000 000 and determine the   value of each digit   * 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 * round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 * solve number problems and practical problems that involve all of the above * read Roman numerals to 1000 (M) and recognise years written in Roman numerals | * 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 * use negative numbers in context, and calculate intervals across zero * solve number and practical problems that involve all of the above. |

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|  | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Addition and subtraction | * read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs. * represent and use number bonds and related subtraction facts within 20 * add and subtract one-digit and two-digit numbers to 20, including zero * solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems | * solve problems with addition and subtraction:   -using concrete objects and pictorial representations, including those involving numbers, quantities and measures  -applying their increasing knowledge of mental and written methods   * recall and use addition & subtraction facts to 20 fluently, & derive & use related facts up to 100 * add & subtract numbers using concrete objects, pictorial representations, & mentally, including:   -a two-digit number & ones  -a two-digit number & tens  -two two-digit numbers  -adding three one-digit numbers   * show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot * recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems | * add and subtract numbers mentally, including:   -a three-digit number and ones  -a three-digit number and tens  -a three-digit number and hundreds   * add and subtract numbers with up to three digits, using formal written methods of   columnar addition and *subtraction*   * *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 | * add and subtract numbers with up to 4 digits using the formal written methods of   columnar addition and subtraction where appropriate   * 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. | * add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) * add and subtract numbers mentally with increasingly large numbers * 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. | * perform mental calculations, including with mixed operations and large numbers * 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 * use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. |

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| Multiplication and division | * solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. | * recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers * 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   * solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. | * recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables * 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 and progressing to formal written methods   * 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. | * recall multiplication and division facts for multiplication tables up to 12 × 12 * 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 two-digit and three-digit numbers by a one-digit number using formal written   layout   * 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. | * 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 * 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 * multiply and divide numbers mentally drawing upon known facts * 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 and divide whole numbers and those involving decimals by 10, 100 and 1000 * ♣ recognise and use square numbers and cube numbers, and the notation for squared ( 2 ) and cubed (3 ) ♣ 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. | * 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 the context * perform mental calculations, including with mixed operations and large numbers * identify common factors, common multiples and prime numbers * use their knowledge of the order of operations to carry out calculations involving the   four operations   * use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy |

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| 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 * write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2 | * 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 * recognise and use fractions as numbers: unit fractions and non-unit fractions with   small denominators   * recognise and show, using diagrams, equivalent fractions with small denominators * add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7] * compare and order unit fractions, and fractions with the same denominators * solve problems that involve all of the above. | * recognise and show, using diagrams, families of common equivalent fractions * count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. * 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   * add and subtract fractions with the same denominator * recognise and write decimal equivalents of any number of tenths or hundredths * recognise and write decimal equivalents to ¼, ½, 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 * 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 * solve simple measure and money problems involving fractions and decimals to two decimal places. | * 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 * recognise mixed numbers and improper fractions and convert from one form to the   other and write mathematical statements > 1 as a mixed number [for example, 2/5 + 4/5 = 6/5 = 1 1/5]   * 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 * read and write decimal numbers as fractions [for example , 0.71 = 71/100] * 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 * solve problems involving number up to three decimal places * 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 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 | * use common factors to simplify fractions; use common multiples to express fractions in the same denomination * compare and order fractions, including fractions > 1 * 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 [for example, 1/4 x 1/2 = 1/8] * divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6] * associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8] * identify the value of each digit in numbers given to three decimal places and multiply   and divide numbers by 10, 100 and 1000 giving answers up to three decimal places   * multiply one-digit numbers with up to two decimal places by whole numbers * use written division methods in cases where the answer has up to two decimal places * 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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| Measurement | * compare, describe and solve practical problems for:   -lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]  -mass/weight [for example, heavy/light, heavier than, lighter than]  -capacity and volume [for example, full/empty, more than, less than, half,  half full, quarter]  -time [for example, quicker, slower, earlier, later]   * measure and begin to record the following:   -lengths and heights  -mass/weight  -capacity and volume  -time (hours, minutes, seconds)   * recognise and know the value of different denominations of coins and notes * sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] * 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. | * choose and use appropriate standard units to estimate and measure length/height in any direction (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 = * 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   * compare & 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. | * measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) * measure the perimeter of simple 2-D shapes * add and subtract amounts of money to give change, using both £ and p in practical contexts * 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 [for example to calculate the time taken by particular   events or tasks]. | * Convert between different units of measure [for example, kilometre to metre; hour to   minute]   * measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres * find the area of rectilinear shapes by counting squares * estimate, compare and calculate different measures, including money in pounds and pence * 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. | * convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) * understand and use approximate equivalences between metric units and common   imperial units such as inches, pounds and pints   * 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 * estimate volume [for example, using 1cm3 blocks to build cuboids (including cubes)]   and capacity [for example, using water]   * solve problems involving converting between units of time * use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. | * 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 * 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 [for example, mm3 and km3]. |

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| Geometry – properties of shapes | * recognise and name common 2-D and 3-D shapes, including:   -2-D shapes [for example, rectangles (including squares), circles and triangles]  -3-D shapes [for example, cuboids (including cubes), pyramids and spheres]. | * identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line * 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, [for example, a circle on a cylinder and a triangle on a pyramid] * compare and sort common 2-D and 3-D shapes and everyday objects. | * draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D   shapes in different orientations and describe them   * 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   than or less than a right angle   * identify horizontal and vertical lines and pairs of perpendicular and parallel lines. | * compare and classify geometric shapes, including quadrilaterals and triangles, based   on their properties and sizes   * identify acute and obtuse angles and compare and order angles up to two right angles by size * identify lines of symmetry in 2-D shapes presented in different orientations * complete a simple symmetric figure with respect to a specific line of symmetry | * identify 3-D shapes, including cubes and other cuboids, from 2-D representations * know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles * draw given angles, and measure them in degrees (o) * identify:   -angles at a point and one whole turn (total 360o)  -angles at a point on a straight line and ½ a turn (total 180o)  -other multiples of 90o   * 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 * recognise, describe and build simple 3-D shapes, including making nets * compare and classify geometric shapes based on their properties and sizes and find   unknown angles in any triangles, quadrilaterals, and regular polygons   * illustrate and name parts of circles, including radius, diameter and circumference and   know that the diameter is twice the radius   * 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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| Geometry – position and direction | * describe position, direction and movement, including whole, half, quarter and three-quarter turns | * identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line * 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, [for example, a circle on a cylinder and a triangle on a pyramid] * compare and sort common 2-D and 3-D shapes and everyday objects. * ♣ 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 three-quarter turns (clockwise and anticlockwise). |  | * 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. |
| Statistics |  | * interpret and construct simple pictograms, tally charts, block diagrams and simple tables * 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. | * interpret and present data using bar charts, pictograms and tables * 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. | * interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. * solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. | * solve comparison, sum and difference problems using information presented in a line   graph   * complete, read and interpret information in tables, including timetables. | * interpret and construct pie charts and line graphs and use these to solve problems * calculate and interpret the mean as an average. |

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| Ratio and 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 the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison * 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. |
| 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. |