# Mathematics Progression Map

| | Early Years | Key Stage 1 | | Lower Key Stage 2 | | Upper Key Stage 2 | |
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| Strand | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| PV- Counting | • Count objects, actions and sounds.<br><br>• Count beyond ten.<br><br><u>ELG:</u><br>Verbally count beyond 20, recognising the pattern of the counting system. | • count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number<br><br>• count 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 or backward | • count from 0 in multiples of 4, 8, 50 and 100;<br><br>• find 10 or 100 more or less than a given number | • count in multiples of 6, 7, 9, 25 and 1 000<br><br>• 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<br><br>• count forwards and backwards with positive and negative whole numbers, including through zero | • use negative numbers in context, and calculate intervals across zero |
| PV - Representing | • subitise.<br><br>• Link the number symbol (numeral) with its cardinal number value.<br><br><u>ELG:</u><br>Subitise (recognise quantities without counting) up to 5. | • identify and represent numbers using objects and pictorial representations including the number line<br><br>• read and write numbers to 100 in numerals; count in multiples of twos, fives and tens<br><br>• read and write numbers from 1 to 20 in numerals and words. | • identify, represent and estimate numbers using different representations, including the number line<br><br>• read and write numbers to at least 100 in numerals and in words | • identify, represent and estimate numbers using different representations<br><br>• read and write numbers up to 1 000 in numerals and in words | • identify, represent and estimate numbers using different representations<br><br>• 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 (appears also in Comparing Numbers)<br><br>• read Roman numerals to 1 000 (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 |

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| **PV - Comparing** | • Compare numbers.<br><br>• Understand the 'one more than/one less than' relationship between consecutive numbers.<br><br>• Explore the composition of numbers up to 10.<br><br><u>ELG:</u><br>Compare quantities up to10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.<br><br><u>ELG:</u><br>Have a deep understanding of numbers to 10, including the composition of each number. | • given a number, identify one more and one less<br><br>• use the language of: equal to, more than, less than (fewer), most, least | • recognise the place value of each digit in a two-digit number (tens, ones)<br><br>• compare and order numbers from 0 up to 100; use <, > and = signs | • recognise the place value of each digit in a three-digit number (hundreds, tens, ones) | • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) | • read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Representing) | • read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Representing) |

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| **PV – Rounding & Problems** | • Solve real world mathematical problems with numbers up to 5.<br><br>• Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...' | | • use place value and number facts to solve problems | • solve number problems and practical problems involving these ideas. | • round any number to the nearest 10, 100 or 1 000<br><br>• solve number and practical problems that involve all of the above and with increasingly large positive numbers | • round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000<br><br>• solve number problems and practical problems that involve all of the above | • round any whole number to a required degree of accuracy<br><br>• solve number and practical problems that involve all of the above |

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| **Addition and Subtraction- Recall, Represent, Use** | • Subitise.<br><br>• Explore the composition of numbers to 10.<br><br>• Automatically recall number bonds 0-5 and some to 10.<br><br><u>ELG:</u><br>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.<br><br><u>ELG:</u><br>Have a deep understanding of numbers to 10, including the | • represent and use number bonds and related subtraction facts within 20<br><br>• read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods) | • recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100<br><br>• show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot<br><br>• 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 | • estimate and use inverse operations to check answers to a calculation | • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy<br><br>• add and subtract numbers mentally with increasingly large numbers | • use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.<br><br>• perform mental calculations, including with mixed operations and large numbers |

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| | composition of each number.<br><br>ELG:<br>Subitise (recognise quantities without counting) up to 5. | | | | | | |
| **Addition and Subtraction - Calculations** | • See above | | • add and subtract numbers using concrete objects, pictorial representations, and mentally, including:<br>○ a two-digit number and ones<br>○ a two-digit number and tens<br>○ two two-digit numbers<br>○ adding three one-digit numbers | • add and subtract numbers mentally, including:<br>○ a three-digit number and ones<br>○ a three-digit number and tens<br>○ a three-digit number and hundreds<br><br>• 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 column addition and subtraction where appropriate | • add and subtract whole numbers with more than 4 digits, including using formal written methods (column addition and subtraction) | • use their knowledge of the order of operations to carry out calculations involving the four operations |

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| **Addition and Subtraction – Problem Solving** | ELG:<br>Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly. | • 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>○ applying their increasing knowledge of mental and written methods | • 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 multi-step problems in contexts, deciding which operations and methods to use and why | • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why |

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| **Multiplication and Division – Recall, Represent, Use** | • Explore the composition of numbers to 10.<br><br>ELG:<br>Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.<br><br>ELG:<br>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. | | • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers<br><br>• show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot | • 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<br><br>• use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers<br><br>• recognise and use factor pairs and commutativity in mental calculations | • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.<br><br>• know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers<br><br>• establish whether a number up to 100 is prime and recall prime numbers up to 19<br><br>• recognise and use square numbers and cube numbers, and the notation for squared ($x^2$) and cubed ($x^3$) | • identify common factors, common multiples and prime numbers<br><br>• use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy |

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| **Multiplication and Division - Calculation** | | | • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs | • 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 (appears also in Mental Methods) | • multiply two-digit and three-digit numbers by a one-digit number using formal written layout | • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers<br><br>• multiply and divide numbers mentally drawing upon known facts<br><br>• divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context<br><br>• multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 | • multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication<br><br>• divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context<br><br>• perform mental calculations, including with mixed operations and large numbers |

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| **Multiplication and Division – Problem Solving** | ELG:<br>Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly. | • 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<br><br>• solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates<br><br>• solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign | • solve problems involving addition, subtraction, multiplication and division |

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| **Fractions -Recognise and Write** | | • recognise, find and name a half as one of two equal parts of an object, shape or quantity<br><br>• 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.<br><br>• recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators<br><br>• recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators | • count up and down in hundredths<br><br>• recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten | • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths<br><br>• recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. 2/5 + 4/5 = 6/5 = 11/5) | |
| **Fractions - Compare** | | | • recognise the equivalence of 2/4 and 1/2. | • recognise and show, using diagrams, families of common equivalent fractions<br><br>• compare and order unit fractions, and fractions with the same denominators | • recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten | • compare and order fractions whose denominators are all multiples of the same number | • use common factors to simplify fractions; use common multiples to express fractions in the same denomination<br><br>• compare and order fractions, including fractions >1 |

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| **Fraction - Calculations** | | | • write simple fractions e.g. 1/2 of 6 = 3 | • add and subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7) | • add and subtract fractions with the same denominator | • add and subtract fractions with the same denominator and multiples of the same number<br><br>• multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams | • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions<br><br>• multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. 1/4 × 1/2 = 1/8)<br><br>• divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6 ) |
| **Fractions – Solve Problems** | | | | • solve problems that involve all of the above | • 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 | | |
| **Decimals – Recognise and Write** | | | | | • recognise and write decimal equivalents of any number of tenths or hundredths<br><br>• recognise and write decimal equivalents to 1/4; 1/2; 3/4 | • read and write decimal numbers as fractions (e.g. 0.71 = 71/100)<br><br>• recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents | • identify the value of each digit in numbers given to three decimal places |

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| Decimals - Compare | | | | | • round decimals with one decimal place to the nearest whole number<br>• compare numbers with the same number of decimal places up to two decimal places | • round decimals with two decimal places to the nearest whole number and to one decimal place<br>• read, write, order and compare numbers with up to three decimal places | |
| Decimals - Calculations and Problems | | | | | • 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 | • solve problems involving numbers up to three decimal places | • multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places<br>• multiply one-digit numbers with up to two decimal places by whole numbers<br>• use written division methods in cases where the answer has up to two decimal places<br>• solve problems which require answers to be rounded to specified degrees of accuracy |

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| Fraction, Decimals and Percentages | | | | | • solve simple measure and money problems involving fractions and decimals to two 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 as a decimal fraction<br><br>• solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those with a denominator of a multiple of 10 or 25. | • associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8)<br><br>• recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. |

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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<br><br>• solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison<br><br>• solve problems involving similar shapes where the scale factor is known or can be found<br><br>• solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. |

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| **Algebra** | | • *solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and **missing number problems** such as*<br>*7 = □ - 9* | • *recognise and use the inverse relationship between addition and subtraction and use this to check calculations and **missing number** problems.* | • solve problems, *including **missing number** problems, using number facts, place value, and more complex addition and subtraction.* | | | • use simple formulae<br>• generate and describe linear number sequences<br>• express missing number problems algebraically<br>• find pairs of numbers that satisfy number sentences involving two unknowns<br>• enumerate all possibilities of combinations of two variables |

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| **Measurement – Using Measures** | • Compare length, weight and capacity. | • compare, describe and solve practical problems for: lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] mass/weight [e.g. heavy/light, heavier than, lighter than] capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] time [e.g. quicker, slower, earlier, later] | • 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<br><br>• compare and order lengths, mass, volume/capacity and record the results using >, < and = | • measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) | • convert between different units of measure (e.g. kilometre to metre; hour to minute)<br><br>• estimate, compare and calculate different measures, including money in pounds and pence | • convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)<br><br>• understand and use equivalences between metric units and common imperial units such as inches, pounds and pints<br><br>• use all four operations to solve problems involving measure (e.g. 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<br><br>• use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places<br><br>• convert between miles and kilometres |

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| **Measurement - Money** | | • recognise and know the value of different denominations of **coins and notes** | • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value<br><br>• find different combinations of coins that equal the same amounts of money<br><br>• solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change | • add and subtract amounts of money to give change, using both £ and p in practical contexts | • estimate, compare and calculate different measures, including money in pounds and pence | • use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling. | |

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| **Measurement - Time** | • Begin to describe a sequence of events, real or fictional, using words, such as 'first', 'then...' | • sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]<br><br>• recognise and use language relating to dates, including days of the week, weeks, months and years<br><br>• tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. | • compare and sequence intervals of time<br><br>• tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.<br><br>• know the number of minutes in an hour and the number of hours in a day. | • tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks<br><br>• estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight<br><br>• know the number of seconds in a minute and the number of days in each month, year and leap year<br><br>• compare durations of events, for example to calculate the time taken by particular events or tasks | • read, write and convert time between analogue and digital 12 and 24-hour clocks<br><br>• solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days | • solve problems involving converting between units of time | |

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| Measurement – Perimeter, Area and Volume | | | | • measure the perimeter of simple 2-D shapes | • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres<br><br>• find the area of rectilinear shapes by counting squares | • measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres<br><br>• calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes<br><br>• estimate volume (e.g. using 1 cm3 blocks to build cubes and cuboids) and capacity | • recognise that shapes with the same areas can have different perimeters and vice versa<br><br>• recognise when it is possible to use formulae for area and volume of shapes<br><br>• calculate the area of parallelograms and triangles<br><br>• calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [e.g. mm3 and km3]. |

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| **Geometry: Properties of Shapes – Identifying shapes and their properties** | • Select, rotate and manipulate shapes in order to develop spatial reasoning skills | recognise and name common 2-D and 3-D shapes, including:<br>• 2-D shapes [e.g. rectangles (including squares), circles and triangles]<br>• 3-D shapes [e.g. 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<br>• 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] | | • identify lines of symmetry in 2-D shapes presented in different orientations | • identify 3-D shapes, including cubes and other cuboids, from 2-D representations | • recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing)<br>• illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius |
| **Geometry: Properties of Shapes – Drawing and Constructing** | • Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.<br>• Select, rotate and manipulate shapes in order to develop spatial reasoning skills. | | | • draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them | • complete a simple symmetric figure with respect to a specific line of symmetry | • draw given angles, and measure them in degrees (o) | • draw 2-D shapes using given dimensions and angles<br>• recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties) |

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| **Geometry: Properties of Shapes – Comparing and Classifying** | | | • compare and sort common 2-D and 3-D shapes and everyday objects | | • compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes | • use the properties of rectangles to deduce related facts and find missing lengths and angles<br><br>• distinguish between regular and irregular polygons based on reasoning about equal sides and angles | • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons |
| **Geometry: Properties of Shapes – Angles** | | | | • recognise angles as a property of shape or a description of a turn<br><br>• identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle<br><br>• identify horizontal and vertical lines and pairs of perpendicular and parallel lines | • identify acute and obtuse angles and compare and order angles up to two right angles by size | • know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles<br><br>• identify:<br>*angles at a point and one whole turn (total 360°)<br>*angles at a point on a straight line and ½ a turn (total 180°)<br>*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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| **Geometry: Position, Direction and Movement** | • Draw information from a simple map.<br><br>Pattern:<br>• Continue, copy and create repeating patterns. | • describe position, direction and movement, including 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 anti-clockwise)<br><br>Pattern:<br>• order and arrange combinations of mathematical objects in patterns and sequences | | • describe positions on a 2-D grid as coordinates in the first quadrant<br><br>• describe movements between positions as translations of a given unit to the left/right and up/down<br><br>• plot specified points and draw sides to complete a given polygon | • identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed | • describe positions on the full coordinate grid (all four quadrants)<br><br>• draw and translate simple shapes on the coordinate plane, and reflect them in the axes. |
| **Statistics – Present and Interpret** | | | • interpret and construct simple pictograms, tally charts, block diagrams and simple tables<br><br>• ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity<br><br>• ask and answer questions about totalling and comparing categorical data | • 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 and use these to solve problems |

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| **Statistics – Solve Problems** | | | | • solve one-step and two-step questions [e.g. '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 | • calculate and interpret the mean as an average |