Progression in mathematical teaching and learning at Bramhope Primary School

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place value - counting	-Count to 20, forwards and backwards.	- Count to and across 100, forwards, and backwards, beginning with 0 or 1, or from any given number - 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 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 - 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 - Count forwards and backwards with positive and negative whole numbers, including through zero	

Place value – representing	- Count a group of objects or pictorial representations with 1:1 correspondence - Recognise numbers to 20 - Place numbers to 20 in order	- Identify and represent numbers using objects and pictorial representations - Read and write numbers to 100 in numerals - Read and write numbers from 1 to 20 in numerals and words	- Read and write numbers to at least 100 in numerals and in words - Identify, represent and estimate numbers using different representations including the number line	- Identify, represent and estimate numbers using different representations - Read and write numbers up to 1,000 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 as a place holder	- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit - 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

Place value – comparing	- Identify one more and one less up to 20	- Given a number, identify one more and one less	- Recognise the place value of each digit in a two-digit number (tens, ones) - 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 and ones) - Compare and order numbers up to 1,000	- Find 1,000 more or less than a given number - Recognise the place value of each digit in a four digit number (thousands, hundreds, tens and ones) - Order and compare numbers beyond 1,000	- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit	- Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit

Place value – rounding					**- Round any number to the nearest 10, 100 or 1,000**	**- Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10 000 and 100 000**	**- Round any whole number to a required degree of accuracy**
Place value – solving problems (including negative numbers)			**- 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**	**- Interpret negative numbers in context** **- Solve number problems and practical problems that involve all of the above.**	**- Use negative numbers in context, and calculate intervals across zero** **- Solve number and practical problems that involve all of the above**

Addition and subtraction – recalling, representing and using	**- Using quantities and objects, add and subtract two single-digit numbers and count on or back to find the answer.**	**- Read, write and interpret mathematical statements involving addition (+), subtraction (-) and the equals (=) signs** **- Represent and use number bonds and related subtraction facts within 20**	**- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100** **- Show that addition of two numbers can be done in any order (commutative) and subtraction of 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**	**- 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 the problem, levels of accuracy**	

Addition and subtraction – calculating		**- Add and subtract one-digit and twodigit numbers to 20, including zero**	**- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including:** ***A two-digit number and ones*** ***A two-digit number and tens***	**- 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 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 (columnar addition and subtraction)** **- Add and subtract numbers mentally with increasingly large numbers**	**- Perform mental calculations, including with mixed operations and large numbers** **- Use their knowledge of the order of operations to carry out calculations**
			Two two-digit numbers ***Adding three one-digit numbers.***	**- Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.**			**involving the four operations**

Addition and subtraction – solving problems	- Solve problems, including doubling, halving and sharing (practically).	- 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 objects and pictorial representations, including those involving numbers, quantities and measures* *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 problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
Multiplication and division – recalling, representing and using			- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers - Show that multiplication of two numbers can be done in any order (communitive) and division of one	- 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 x 12 - Use place value, known and derived facts to multiply and divide mentally, including multiplying by 0 and 1; dividing by 1; multiplying	- 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 (nonprime) numbers	- Identify common factors, common multiples and prime numbers - Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

			number by another cannot		**together three numbers** **- Recognise and use factor pairs and commutativity in mental calculations**	**- Establish whether a number up to 100 is prime and recall prime numbers up to 19** **- Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})**	

Multiplication and division – calculating			**- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) sign.**	**- 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**	**- Multiply two-digit and three-digit numbers by a onedigit number using formal written layout**	**- Multiply numbers up to 4 digits by a one-digit or twodigit 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 multidigit 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**

						- Multiply and divide whole numbers and those involving decimals by 10,100 and 1000	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
Multiplication and division – solving problems		- 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 context	- Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and harder correspondence problems such as *n objects are connected to m objects*	- Solve problems involving multiplying and adding, including 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 multiplication and division, including scaling by simple fractions and problems involving simple rates	- Solve problems involving addition, subtraction, multiplication and division

Multiplication and division – combining operations						**- Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign**	**- Use their knowledge of the order or operations to carry out calculations involving the four operations**
Fractions – recognising and writing	**- Understand if we cut an object into 2 pieces we have half.**	**- 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 and name and write fractions 1/3, ¼, 2/4, ¾ of a length, shape, set of objects or quantity**	**- Count up and down in tenths; recognise that tenths arise form dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10** **- Recognise, find and write fractions of a discrete set of objects; unit fractions and nonunit fractions with small denominators** **- Recognise and use fractions as numbers; unit fractions and nonunit fractions with small denominators**	**- Count up and down in hundredths; 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** **- 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]**	

Fractions - comparing			**- Recognise the equivalence of 2/4 and 1/2**	**- 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**	**- Use common factors to simplify fractions; use common multiples to express fractions in the same denomination**

				- Compare and order unit fractions, and fractions with the same denominators			**- Compare and order fractions, including fractions >1**
Fractions – calculating			**- Write simple fractions for example, ½ of 6 = 3**	**- 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 [for example, ¼ x ½ = 1/8]** **- Divide proper fractions by whole number [for example, 1/3 ÷ 2 = 1/6]**

Fractions - Solving 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 – recognising and writing					**- Recognise and write decimal equivalents of any number of tenths or hundredths** **- Recognise and write decimal equivalents to ¼, ½, ¾**	**- 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**	**- Identify the value of each digit in numbers given to three decimal places**

Decimals - comparing					**- 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**	**- 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**	
Decimals – calculating and solving problems					**- Find the effect of dividing a one or two digit number by 10 and 100, identifying the value of the digits in the answers as ones, tenths and hundredths**	**- Solve problems involving number up to three decimal places**	**- multiply and divide numbers by 10, 100 and 1000 giving answers up the 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**

Fractions, 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, and as a decimal** **- 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**	**- Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8]** **- Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts**
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 or grouping using knowledge of fractions and multiples**

Algebra ***(introduced earlier than year 6 as 'missing numbers)***		***- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? - 9***	***- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems***	***- Solve problems, including missing number problems***			**- 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

Measurement – using measures	- Use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.	- Compare, describe and solve practical problems for *Lengths and heights (e.g. long / short, longer / shorter, tall / short, double / half)* *Mass and 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)* - Measure and begin to record the following *Lengths and heights, mass / weight, capacity and volume, time (hours, minutes, seconds)*	- 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 =	- Measure, compare, add and subtract lengths (m/cm/mm), mass (kg/g); volume/capacity (l/ml)	- Convert between different units of measure (for example, kilometre to metre; hour to minute) - Estimate, compare and calculate different measures	- 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 unit and common imperial units such as inches, pounds and pints - 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 up to three decimal places - Convert between miles of kilometres
Measurement - money	- Use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.	- 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	- 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 (for example, money)	

			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**				

Measurement – time	- Use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.	- Sequence events in chronological order using language (for example, before, 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	- 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	- 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	- Use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa

				- Compare durations of events (for example to calculate the time taken by particular events of tasks)			

Measurement – perimeter, area and volume				- Measure the perimeter of simple 2D shapes	- Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres - Find the area or 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 (cm^2) and square meters (m^2) and estimate the area of irregular shapes - Estimate volume (for example, using 1cm^3 blocks to build cuboids – including cubes) and capacity (for examples, using water)	- 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 usinf standard units, including cubic centimetres (cm^3) and cubic metres (m^3) and extending to other units (for example, mm^3 and km^3).
Geometry – 2d shapes	- Explore characteristics of everyday objects and shapes and use mathematical	- Recognise and name common 2D shapes (for example, rectangles – including squares	- Identify and describe the properties of 2D shapes, including the number of sides and line	- Draw 2D shapes	- Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles	- Draw 2D shapes using given dimensions and angles - Compare and classify geometric shapes based on

	language to describe them.	– circles and triangles)	symmetry in a vertical line - Identify 2D shapes on the surface of 3D shapes, (for example, a circle on a cylinder and a triangle on a pyramid) - Compare and sort common 2D shapes and everyday objects		- Identify lines of symmetry in 2D shapes presented in different orientations	- Use the properties of rectangles to deduce related facts and find missing lengths and angles	their properties and sizes - Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
Geometry – 3d shapes	- Explore characteristics of everyday objects and shapes and use mathematical language to describe them.	- Recognise and name common 3D shapes (for example cuboids – including cubes – pyramids and spheres	- Recognise and name common 3D shapes (for example, cuboids – including cubes – pyramids and spheres - Compare and sort common 3D shapes and everyday objects	- Make 3D shapes using modelling materials; recognise 3D shapes in different orientations and describe them		- Identify 3D shapes, including cubes and other cuboids, from 2D representations	- Recognise, describe and build simple 3D shapes, including making nets

Geometry – Angles and lines				**- Recognise angles as a property of a 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**	**- Identify acute and obtuse angles and compare and order angles up to two right angles by size** **- Identify lines of symmetry in 2D shapes presented in different orientations** **- Complete a simple symmetric figure with respect**	**- 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°)***	**- Find unknown angles in any triangles, quadrilaterals, and regular polygons** **- Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles**
				angles are greater than or less than a right angle **- Identify horizontal and vertical lines and pairs of perpendicular and parallel lines**	**to a specific line of symmetry**	***Angles at a point on a straight line and ½ a turn (total 180°)*** ***Other multiples of 90°***	

Geometry – position and 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 three-quarter turns (clockwise and anticlockwise)**		**- Describe positions on a 2D 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 positon 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 – presenting and interpreting			**- 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 and use these to solve problems**

Statistics – solving problems			**- 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 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**	**- Calculate and interpret the mean as an average**