Killigrew Maths Progression Map – Supplementary framework

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number and Place Value	Check quantities of a number by counting up to 5.	Estimate a number of objects and check quantities by counting up to 20.	Practise counting and ordering (including solving simple concrete problems, until they are fluent). Begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations. Practise counting as reciting numbers and counting as enumerating objects, and counting in twos, fives and tens from different multiples to develop their recognition of patterns in the number system, including varied and frequent practice	Use materials and a range of representations to practise counting, reading, writing and comparing numbers to at least 100. Solve a variety of related problems to develop fluency. Count in multiples of three to support their later understanding of a third. Explore larger numbers to develop their recognition of patterns within the number system and how to represent numbers in different ways (including spatial representations). Partition numbers in different ways to support subtraction.	Use multiples of 2, 3, 4, 5, 8, 10, 50 and 100. Use larger numbers to at least 1000, applying partitioning related to place value using varied and increasingly complex problems, building on work in year 2. Use a variety of representations, including those related to measure. Count in ones, tens and hundreds, to become fluent in the order and place value of numbers to 1000.	Use a variety of representations, including measures. Understand the order and place value of numbers beyond 1000, including counting in tens and hundreds. Maintains fluency in other multiples through varied and frequent practice. Begin to extend knowledge of the number system to include the decimal numbers and fractions that they have met so far. Connect estimation and rounding numbers to the use of measuring instruments. Understand that there have been	Identify the place value in large whole numbers. Use number in context, including measurement. Extend and apply their understanding of the number system to the decimal numbers and fractions that they have met so far. Recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule. Recognise and describe linear number sequences, including those involving fractions and decimals.	Use the whole number system, including saying, reading and writing numbers accurately.

			through increasingly complex questions. Recognise and create repeating patterns with objects and with shapes.	Apply their knowledge of numbers to reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers. Begin to understand zero as a placeholder.		different ways to write whole numbers (Roman numeral system) and that the important concepts of zero and place value were introduced over a period of time.	Find the term-to-term rule in words.	
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Addition and Subtraction			Memorise and reason with number bonds to 10 and 20 in several forms. Realise the effect of adding or subtracting zero. Establish addition and subtraction as related operations. Combine and increase numbers,	Extend their understanding of the language of addition and subtraction to include sum and difference. Practise addition and subtraction to 20 to become increasingly fluent in deriving facts. Check calculations, including adding to	Practise solving varied addition and subtraction questions. Understand that for mental calculations with two-digit numbers, the answers could exceed 100. Use their understanding of place value and partitioning, and	Continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency.	Practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency. Practise mental calculations with increasingly large numbers.	Practise addition and subtraction for larger numbers, using the formal written methods of columnar addition and subtraction. Undertake mental calculations with increasingly large numbers and calculations that are more complex.

			counting forwards and backwards. Discuss and solve problems in familiar practical contexts, including using quantities. Solve problems including the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than. Develop the concept of addition and subtraction and use these operations flexibly.	check subtraction and adding numbers in a different order. Establish commutativity and associativity of addition. Record addition and subtraction in columns to support place value. Prepare for formal written methods with larger numbers.	practise using columnar addition and subtraction with increasingly large numbers up to three digits to become fluent.			Round answers to a specified degree of accuracy. Explore the order of operations using brackets.
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Multiplication and Division	Explore grouping by grouping objects by colour and size.	Solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups.	Through grouping and sharing small quantities, begin to understand key calculations: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.	Use a variety of language to describe multiplication and division. Practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other.	Practise their mental recall of multiplication tables when they are calculating mathematical statements. Through doubling, connect the 2, 4 and 8 multiplication tables.	Continue to practise recalling and using multiplication tables and related division facts to aid fluency. Practise mental methods and extend this to three-digit numbers to derive facts.	Practise and extend the use of the formal written methods of short multiplication and short division. Apply all the multiplication tables and related division facts frequently, commit them to memory and use	Practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division.

			Make connections between arrays, number patterns, and counting in twos, fives and tens.	Connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on a clock face. Begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. Work with a range of materials and contexts in which multiplication and division relate to grouping. Share discrete and continuous quantities. Formulate arrays and understand repeated addition. Begin to relate calculations to fractions and measures.	Develop efficient mental methods, for example, using commutativity and associativity. Develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division. Solve simple problems in contexts, deciding which of the four operations to use and why. Solve problems involving measuring and scaling contexts, and correspondence problems in which m objects are connected to n objects.	Become fluent in the formal written method of short multiplication and short division with exact answers. Write statements about the equality of expressions. Combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations. Solve two-step problems in contexts, choosing the appropriate operation.	them confidently to make larger calculations. Use and understand the terms factor, multiple and prime, square and cube numbers. Interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding. Use multiplication and division as inverses to support the introduction of ratio in year 6. Understand the terms factor, multiple, prime, square, cube numbers, and use them to construct equivalence statements.	Undertake mental calculations with increasingly large numbers and calculations that are more complex. Continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency. Round answers to a specified degree of accuracy. Explore the order of operations using brackets. Understand that common factors can be related to finding equivalent fractions.

				Use commutativity and inverse relations to develop multiplicative reasoning.			Use and explain the equals sign to indicate equivalence, including in missing number problems.	
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Fractions, Decimals and Percentages			Understand half and quarter as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. Connect halves and quarters to the equal sharing and grouping of sets of objects and to measures. Recognise and combine halves and quarters as parts of a whole.	Use fractions as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. Connect unit fractions to equal sharing and grouping, to numbers and to measures, finding fractions of lengths, quantities, set of objects or shapes. Explore $\frac{3}{4}$ as an example of a non-unit fraction. Count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line.	Connect tenths to place value, decimal measures and to division by 10. Begin to understand unit and non-unit fractions as numbers on the number line, and deduce relations between them, such as size and equivalence. Explore beyond the [0, 1] interval, including relating this to measure. Understand the relation between unit fractions as operators (fractions of), and division by integers. Continue to recognise fractions in the context of parts of a whole, numbers, measurements, a	Connect hundredths to tenths and place value and decimal measure. Extend the use of the number line to connect fractions, numbers and measures. Understand the relation between non-unit fractions and multiplication and division of quantities, with particular emphasis on tenths and hundredths Make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities.	Understand that percentages, decimals and fractions are different ways of expressing proportions. Extend the knowledge of fractions to thousandths and connect to decimals and measures. Connect equivalent fractions > 1 that simplify to integers with division and other fractions > 1 to division with remainders, using the number line. Explore improper and mixed fractions. Connect multiplication by a fraction to using	Practise, use and understand the addition and subtraction of fractions with different denominators by identifying equivalent fractions with the same denominator. Progress to varied and increasingly complex problems. Use a variety of images to support their understanding of multiplication with fractions. Use their understanding of the relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit

				shape, and unit fractions as a division of a quantity. Practise adding and subtracting fractions with the same denominator through a variety of increasingly complex problems to improve fluency.	Use factors and multiples to recognise equivalent fractions and simplify where appropriate. Continue to practise adding and subtracting fractions with the same denominator, to become fluent through a variety of increasingly complex problems beyond one whole. Understand the number system and decimal place value to tenths and then hundredths. Relates decimal notation to division of whole number by 10 and later 100. Practise counting using simple fractions and decimal fractions, both forwards and backwards. Learn decimal notation and the language associated	fractions as operators (fractions of), and to division. Scale by simple fractions, including fractions > 1. Practise adding and subtracting fractions to become fluent through a variety of increasingly complex problems. Extend an understanding of adding and subtracting fractions to calculations that exceed 1 as a mixed number. Continue to practise counting forwards and backwards in simple fractions. Develop an understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities.	fraction to find the whole quantity. Practise calculations with simple fractions and decimal fraction equivalents to aid fluency, including listing equivalent fractions to identify fractions with common denominators. Explore and make conjectures about converting a simple fraction to a decimal fraction. Learn about rounding the decimal to three decimal places, or other appropriate approximations depending on the context. Multiply and divide numbers with up to two decimal places by one-digit and two-digit whole numbers. Multiply decimals by whole numbers, starting with the

					with it, including in the context of measurements. Make comparisons and order decimal amounts and quantities that are expressed to the same number of decimal places. Represent numbers with one or two decimal places in several ways, such as on number lines.	Extend counting strategies from year 4, using decimals and fractions including bridging zero. Say, read and write decimal fractions and related tenths, hundredths and thousandths accurately. Check the reasonableness of their answers to problems. Mentally add and subtract tenths, and one-digit whole numbers and tenths. Practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1. Solve puzzles involving decimals.	simplest cases, and in practical contexts, such as measures and money. Introduce the division of decimal numbers by one-digit whole number, initially, in practical contexts involving measures and money. Recognise division calculations as the inverse of multiplication. Develop the skills of rounding and estimating as a means of predicting and checking the order of magnitude of their answers to decimal calculations. Round answers to a specified degree of accuracy and checking the reasonableness of their answers.

							Make connections between percentages, fractions and decimals.	
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Measurement	Make comparisons between objects relating to size, length, weight and capacity.	Estimate, measure, weigh, compare, order objects, and talk about properties, position and time.	Move from using and comparing different types of quantities and measures using non-standard units to using manageable common standard units. Begin to use measuring tools such as a ruler, weighing scales and containers. Use the language of time, including telling the time throughout the day, first using o'clock and then half past.	Use standard units of measurement with increasing accuracy, using their knowledge of the number system. Use the appropriate language and record using standard abbreviations. Compare Measures, includes simple multiples. Tell the time on analogue clocks and record it. Count and recognise coins. Read and say amounts of money confidently and use the symbols £ and p accurately, recording pounds and pence separately.	Measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed units and simple equivalents of mixed units. Compare measures including simple scaling by integers, connected to multiplication. Become fluent in recognising the value of coins, by adding and subtracting amounts, including mixed units, and giving change using manageable amounts. Record £ and p separately. Use both analogue and digital 12-hour	Understand place value and decimal notation to record metric measures, including money. Use multiplication to convert from larger to smaller units. Express perimeter algebraically. Relate area to arrays and multiplication.	Use their knowledge of place value and multiplication and division to convert between standard units. Calculate the perimeter of rectangles and related composite shapes, including using the relations of perimeter or area to find unknown lengths. Express missing measures algebraically. Calculate the area from scale drawings using given measurements. Use all four operations in problems involving time and money, including conversions.	Connect conversion to a graphical representation as preparation for understanding linear/proportional graphs. Understand approximate conversions and explain if an answer is sensible. Use the number line to add and subtract positive and negative integers for measures such as temperature. Relate the area of rectangles to parallelograms and triangles and calculate their areas. Understand and use the formulae for calculating area (in words or symbols). Introduce compound units for speed, such

					clocks and record their times.			as miles per hour, and apply their knowledge in science or other subjects as appropriate.
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Geometry - Properties of shapes			Handle common 2-D and 3-D shapes, naming these and related everyday objects fluently. Recognise shapes in different orientations and sizes, and know that rectangles, triangles, cuboids and pyramids are not always similar to each other.	Handle and name a wider variety of common 2-D and 3-D shapes including the following: quadrilaterals and polygons, and cuboids, prisms and cones. Identify the properties of each shape. Identify, compare and sort shapes based on their properties, using vocabulary precisely. Read and write names for shapes that are appropriate for their word	Explore symmetrical and non-symmetrical polygons and polyhedral shapes. Describe the properties of 2-D and 3-D shapes using accurate language, including lengths of lines and acute and obtuse for angles greater or lesser than a right angle. Connect decimals and rounding to drawing and measuring straight lines in centimetres, in a variety of contexts.	Continue to classify shapes using geometrical properties, extending to classifying different triangles and quadrilaterals. Compare and order angles in preparation for using a protractor and compare lengths and angles to decide if a polygon is regular or irregular. Draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry. Recognise line symmetry in a variety	Become accurate in drawing lines with a ruler to the nearest millimetre, and measuring with a protractor. Use conventional markings for parallel lines and right angles. Use the term diagonal and make conjectures about the angles formed by diagonals and sides, and other properties of quadrilaterals, for example using dynamic geometry ICT tools.	Draw shapes and nets accurately, using measuring tools and conventional markings and labels for lines and angles. Describe the properties of shapes and explain how unknown angles and lengths are from known measurements. Begin to express relationships algebraically i.e. $d = 2 \times r$; $a = 180 - (b + c)$.

				reading and spelling. Draw lines and shapes using a straight edge.		of diagrams, including where the line of symmetry does not dissect the original shape.	Use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems.	
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Geometry – position and direction	Understand position through words using the words in front and behind.	Start to use the language of position, direction and motion: *on top of, middle, inside and outside.*	Use the language of position, direction and motion*: left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside.* Make whole, half, quarter and three-quarter turns in both directions. Connect turning clockwise with movement on a clock face.	Work with patterns of shapes, including those in different orientations. Use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts.	Review and revise positional language and patterns.	Draw a pair of axes in one quadrant, with equal scales and integer labels. Read, write and use pairs of coordinates (2, 5) including using coordinate-plotting ICT tools.	Recognise and use reflection and translation in a variety of diagrams, including continuing to use a 2-D grid and coordinates in the first quadrant. Reflection should be in lines that are parallel to the axes.	Draw and label a pair of axes in all four quadrants with equal scaling. Draw and label rectangles, parallelograms and rhombuses, specified by coordinates in the four quadrants. Predict missing coordinates using the properties of shapes. Begin to express algebraically for example, translating vertex (a, b) to (a-2, b+3); (a, b) and (a+d, b+d) being opposite vertices of a square of side d.
	Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Statistics				Record, interpret, collate, organise and compare information.	Understand and use simple scales in pictograms and bar charts with increasing accuracy.	Understand and use a greater range of scales in their representations.	Connect their work on coordinates and scales to their interpretation of time graphs.	Connect their work on angles, fractions and percentages to the interpretation of pie charts.

				Continue to interpret data presented in many contexts.	Begin to relate the graphical representation of data to recording change over time.	Begin to decide which representations of data are most appropriate and why.	Encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects. Connect conversion from kilometres to miles in measurement to its graphical representation. Know when it is appropriate to find the mean of a data set.
Year 6							
Ratio and proportion	• Recognise proportionality in contexts when the relations between quantities are in the same ratio. • Link percentages or 360° to calculating angles of pie charts. • Consolidate an understanding of ratio when comparing quantities, size and scale drawings by solving a variety of problems. Use the notation a:b to record their work. • Solve problems involving unequal quantities.						
Year 6							
Algebra	• Use symbols and letters to represent variables and unknowns in mathematical situations that they already understand: missing numbers, lengths, coordinates and angles, formulae in mathematics and science, equivalent expressions (for example, a + b = b + a), generalisations of number patterns and number puzzles (e.g. what two numbers can add up to)						