Disciplinary Knowledge Progression- Maths

(HOW?) **Disciplinary Knowledge Progression -Maths – EYFS, KS1 & KS2**							
Pre-School	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value: • say one number for each item in order: 1,2,3,4,5 • show 'finger numbers' up to 5 • link numerals and amounts: for example, showing the right number of objects to • match the numeral, up to 5 • experiment with their own symbols and marks as well as numerals • solve real-world mathematical problems with numbers up to 5 •	Place Value: • Subitise	Place Value: • identify and represent numbers using objects and pictorial representations (A1) • given a number, identify one more and one less (A1)	Place Value: • identify, represent and estimate numbers using different representations, including the number line (A1) • compare and order numbers from 0 up to 100; use and = signs (A1) • use place value and number facts to solve problems (A1)	Place Value: • identify, represent and estimate numbers using different representations (A1) • compare and order numbers up to 1000 (A1) • solve number problems and practical problems involving all place value knowledge (A1)	Place Value: • identify, represent and estimate numbers using different representations (A1) • find 1000 more or less than a given number (A1) • order and compare numbers beyond 1000 (A1) • round any number to the nearest 10, 100 or 1000 (A1) • solve number and practical problems that involve all place value knowledge and with increasingly large positive numbers (A1)	Place Value: • order and compare numbers to at least 1 000 000 and determine the value of each digit (A1) • interpret negative numbers in context (A1) • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 (A1) • solve number problems and practical problems that involve all place value knowledge (A1)	Place Value: • order and compare numbers up to 10 000 000 and determine the value of each digit (A1) • round any whole number to a required degree of accuracy (A1) • solve number and practical problems that involve all place value knowledge (A1)
Addition and Subtraction: • compare quantities using language 'more than' and 'fewer than' •	**Addition and Subtraction:** • Compare numbers • Understand the 'one more than, one less than' relationship between consecutive numbers	**Addition and Subtraction:** • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = c – 9 (A1/2)	**Addition and Subtraction:** • solve problems with addition and subtraction: Ø using concrete objects and pictorial representations, including those involving numbers, quantities and measures	**Addition and Subtraction:** • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction (A1/2)	**Addition and Subtraction:** • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why (A1)	**Addition and Subtraction:** • solve addition and subtraction multistep problems in contexts, deciding which operations and methods to use and why (A1) • solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding	**Addition and Subtraction:** • use their knowledge of the order of operations to carry out calculations involving the four operations (A1) • solve addition and subtraction multistep problems in contexts, deciding which operations and methods to use and why (A1)

			Ø applying their increasing knowledge of mental and written methods (A1/2)			the meaning of the equals sign (A1)	
		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 (A2/Su1)	**Multiplication and Division:** • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot (Spr1) • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs (Spr1) • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts (Spr1)	**Multiplication and Division:** • write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for twodigit numbers times one-digit numbers, using mental and progressing to formal written methods (Spr1) • 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 (Spr1)	**Multiplication and Division:** • 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 (A2/Spr1) • recognise and use factor pairs and commutativity in mental calculations (A2/Spr1) • multiply two-digit and three-digit numbers by a onedigit number using formal written layout (A2/Spr1) • 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 (A2/Spr1)	**Multiplication and Division:** • establish whether a number up to 100 is prime and recall prime numbers up to 19 (A1/2) • multiply numbers up to 4 digits by a one- or twodigit number using a formal written method, including long multiplication for two-digit numbers (Spr1) • multiply and divide numbers mentally drawing upon known facts (Spr1) • 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 (Spr1) • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 (A1/2) • solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes (A1/2) • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates (Spr1)	**Multiplication and Division:** • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy (A1) • multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication (A1) • 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 (A1) • 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 (A1) • perform mental calculations, including with mixed operations and large numbers (A1) • solve problems involving addition,

						• solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign (Spr1)	subtraction, multiplication and division (A1) • use their knowledge of the order of operations to carry out calculations involving the four operations (A1)
				Fractions: • 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 (Spr2) • recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators (Spr2) • recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators (Spr2) • recognise and show, using diagrams, equivalent fractions with small denominators (Spr2) • compare and order unit fractions, and fractions with the same denominators (Spr2) • solve problems that involve all of the above (Spr2/Su1)	**Fractions:** • count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. (Spr2) • recognise and show, using diagrams, families of common equivalent fractions (Spr2) • 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 (Spr2) • round decimals with one decimal place to the nearest whole number (Spr2) • compare numbers with the same number of decimal places up to two decimal places (Spr2) • solve simple measure and money problems involving fractions and decimals to two decimal places (Spr2)	**Fractions:** • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths (A2) • compare and order fractions whose denominators are all multiples of the same number (A2) • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (Spr2) • round decimals with two decimal places to the nearest whole number and to one decimal place (Spr2) • read, write, order and compare numbers with up to three decimal places (Spr2)	**Fractions:** • use common factors to simplify fractions; use common multiples to express fractions in the same denomination (A2) • compare and order fractions, including fractions > 1 (A2) • associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction (Spr2) • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts (Spr2)
		Ratio, Proportion and Algebra: • solve one-step problems that involve addition and subtraction, using concrete	**Ratio, Proportion and Algebra:** • recognise and use the inverse relationship between addition and subtraction and	**Ratio, Proportion and Algebra:** • solve problems, including missing number problems (Throughout year)	**Ratio, Proportion and Algebra:**	**Ratio, Proportion and Algebra:**	**Ratio, Proportion and Algebra:** • solve problems involving the relative sizes of two quantities where missing values can be found by using

		objects and pictorial representations, and missing number problems such as 7 = c – 9 (A2/Su1)	use this to check calculations and solve missing number problems (A1/2)				integer multiplication and division facts (A2) • solve problems involving the calculation/use of percentages for comparison (Spr2) • solve problems involving similar shapes where the scale factor is known or can be found (Spr1) • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples (Spr2) • express missing number problems algebraically (Spr1) • find pairs of numbers that satisfy an equation with two unknowns (Spr1) • enumerate possibilities of combinations of two variables (Spr1)
		Measurement: • compare, describe and solve practical problems for: Ø lengths and heights Ø mass/weight Ø capacity and volume Ø time (Spr2/Su2) • measure and begin to record the following: Ø lengths and heights Ø mass/weight Ø capacity and volume Ø time (hours, minutes,	**Measurement:** • compare and order lengths, mass, volume/capacity and record the results using >, < and = (Spr2) • find different combinations of coins that equal the same amounts of money (Spr1) • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (Spr1)	**Measurement:** • measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) (Su1/2) • add and subtract amounts of money to give change, using both £ and p in practical contexts (Su1) • 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 (Su1/2)	**Measurement:** • Convert between different units of measure [for example, kilometre to metre; hour to minute] (Spr1/Su1) • estimate, compare and calculate different measures (Spr1) • estimate, compare and calculate different measures, including money in pounds and pence (Spr1/Su1) • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (Su1) • measure and calculate the perimeter of a	**Measurement:** • convert between different units of metric measure (Su2) • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling (Su2) • use all four operations to solve problems involving measure [for example, money] (Su2) • solve problems involving converting between units of time (Spr2) • measure and calculate the perimeter of composite rectilinear	**Measurement:** • solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 d.p. where appropriate (A2) • 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 (A2) • recognise that shapes with the same areas can have different

		seconds) (Spr2/Su2) • sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] (All year)	• compare and sequence intervals of time (Su1)	• compare durations of events [for example to calculate the time taken by particular events or tasks] (Su1/2) • measure the perimeter of simple 2-D shapes (Spr1/2)	rectilinear figure (including squares) in centimetres and metres (A2) • find the area of rectilinear shapes by counting squares (A2)	shapes in centimetres and metres (Su1) • 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 (Su1) • estimate volume [for example, using blocks to build cuboids] and capacity [for example, using water] (Su2)	perimeters and vice versa (Spr2) • recognise when it is possible to use formulae for area and volume of shapes (Spr2)
Geometry: • understand position through words alone, for example, "The bag is under the table," with no pointing • describe a familiar route • make comparisons between objects relating to size, length, weight and capacity • select shapes appropriately such as flat surfaces for building or a triangular prism for a roof • combine shapes to make new ones, for example, an	**Geometry:** • Select, rotate and manipulate shapes to develop spatial reasoning skills • Continue, copy and create repeating patterns • Compare length, weight and capacity	**Geometry:** • describe position, direction and movement, including whole, half, quarter and three-quarter turns (Su2)	**Geometry:** • compare and sort common 3-D shapes and everyday objects (A2) • order and arrange combinations of mathematical objects in patterns and sequences (Su2)	**Geometry:** • draw 2-D shapes (Su2) • make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them (Su2)	**Geometry:** • compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes (Su2) • complete a simple symmetric figure with respect to a specific line of symmetry (Su2) • plot specified points and draw sides to complete a given polygon (Su2)	**Geometry:** • use the properties of rectangles to deduce related facts and find missing lengths and angles . (Su1) • draw given angles, and measure them in degrees . (Su1)	**Geometry:** • draw 2-D shapes using given dimensions and angles (Su1) • compare and classify geometric shapes based on their properties and sizes (Su1) • find unknown angles in any triangles, quadrilaterals, and regular polygons (Su1)

arch or a bigger triangle • extend and create ABAB patterns- stick, leaf, stick, leaf • notice and correct an error in a repeating pattern •							
		Statistics:	**Statistics:** • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity (Su2) • ask and answer questions about totalling and comparing categorical data (Su2)	**Statistics:** • 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 (Su2)	**Statistics:** • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs (Su2)	**Statistics:** • solve comparison, sum and difference problems using information presented in a line graph (Spr2)	**Statistics:**