CGINS Progression in Skills: Mathematics

MATHS VOCABULARY	**EYFS:** Build up vocabulary that reflects the breadth of their experiences; use language to compare objects, quantities, describe shape, pattern, position and location (informal and mathematical). Extend vocabulary, especially by grouping and naming, exploring the meaning and sounds of new words. *Greater focus on comparison and vocabulary for comparison – using quantities rather than numbers.*		**Year 1:** Read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Year 1.	**Year 2:** Read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at KS1.
	EYFS Development Matters	Statutory Curriculum Guidance/*Non-Statutory Curriculum Guidance*/Teacher Assessment Framework		Progression to Year 3
	3 and 4 year olds/Children in Reception/Early Learning Goals	YEAR 1	YEAR 2	
NUMBER				
NUMBER & PLACE VALUE				
Counting	Fast recognition of up to 3 objects, without having to count them individually. Recite numbers past 5. Say one number for each item in order: 1,2,3,4,5. Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle'). 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. Count objects, actions and sounds. Subitise. Link the number symbol (numeral) with its cardinal number value. Count beyond ten. Subitise up to 5. 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. Identify one more and one less than a given number. *Count in multiples of twos, fives and tens from different multiples to develop their recognition of patterns in the number system, including varied and frequent practice through increasingly complex questions.* *Recognise and create repeating patterns with objects and with shapes.*	Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward. *Count in multiples of 3 to support their later understanding of a third.*	Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.

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Identifying, Representing and Estimating Numbers	Understand the 'one more than/one less than' relationship between consecutive numbers.	Identify and represent numbers using objects and pictorial representations including number line & use language of equal to, more than, less than (fewer), most, least. Identify one more and one less than a given number.	Identify, represent and estimate numbers using different representations, including the number line	Identify, represent and estimate numbers using different representations.
Reading and Writing Numbers	Experiment with their own symbols and marks as well as numerals. Link numerals and amounts: e.g. showing right number of objects to match numeral, up to 5.	Read and write numbers from 1 to 20 in numerals and words. Count, read and write numbers to 100 in numerals.	Read and write numbers to at least 100 in numerals and in words.	Read and write numbers up to 1000 in numerals and in words.
Compare and Order Numbers	Compare quantities using language: 'more than', 'fewer than'. Compare numbers. Compare quantities up to 10 in different contexts, recognising when one quantity is greater, less or the same as the other.		Compare and order numbers from 0 up to 100; use <, > and = signs.	Compare and order numbers up to 1000.
Understanding Place Value	Have a deep understanding of number to 10, including the composition of each number.	*Pupils 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.*	Recognise place value of each digit in a two-digit number. Use place value and number facts to solve problems. *Partition numbers in different ways (e.g. 23 = 20 + 3 23 = 10 + 13) to become fluent, apply knowledge to reason, discuss & solve problems that emphasise value of each digit in 2-digit numbers.* *Begin to understand zero as a place holder.* Partition any two-digit number into different combinations of tens and ones, explaining thinking verbally, in pictures or using apparatus.	Recognise the place value of each digit in a three-digit number

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Solve Problems	Solve real world mathematical problems with numbers up to 5.	*Practise ordinal numbers and solve simple concrete problems involving counting and ordering.*	Use place value and number facts to solve *related* problems *to develop fluency.*	
		ADDITION AND SUBTRACTION		
Recall, Represent & Use	Automatically recall number bonds for numbers 0–10. Explore the composition of numbers to 10. 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. Have a deep understanding of number to 10, including the composition of each number.	Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs. *Memorise*, represent and use number bonds and related subtraction facts within 20.	Recall and use addition and subtraction facts to 20 *to become fluent in deriving associative facts (e.g. 10 – 7 = 3, 100 – 70 = 30)* 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 one number from another cannot. Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. Use place value and number facts to solve problems Recall all number bonds to and within 10 and use these to reason with and calculate bonds to and within 20, recognising other associated additive relationships within 20 (e.g. 14+3=17, 3+14=17, 17-14=3, 17-3=14).	Estimate the answer to a calculation and use inverse operations to check answers

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Calculations		Add and subtract one-digit and two-digit numbers to 20, including zero. *Realise the effect of adding or subtracting zero.*	Add and subtract numbers using an efficient strategy, explaining their method verbally using concrete objects, pictorial representations, and mentally including: a 2-digit number and ones, a 2-digit number and tens, two 2-digit numbers, two 2-digit numbers that cross 10, add three 1-digit numbers. *Extend the language of addition and subtraction to include sum and difference.* Add and subtract any two 2-digit numbers using an efficient strategy, explaining their method verbally, in pictures or using apparatus. *Begin to record addition and subtraction in columns to support place value and prepare for formal methods with larger numbers.*	Add and subtract numbers mentally, including: HTO+O, HTO+T and HTO+H Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
Solve Problems		Discuss and solve 1-step problems (in familiar practical contexts) that involve addition and subtraction, using concrete objects and pictorial representations and missing number problems. *Problems include terms:put together, add, altogether, total, take away, distance between, difference, more and less, so that pupils develop the concept of addition and subtraction and are able to use operations flexibly.*	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

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MULTIPLICATION AND DIVISION				
Recall, Represent & Use	Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	*To make connections between arrays, number patterns, and counting in twos, fives and tens. Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities*	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers and use them to solve simple problems, demonstrating an understanding of commutativity as necessary. *Use a variety of language to describe multiplication and division.* *Connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face.* Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot, *to develop multiplicative reasoning.* *Become fluent in the 2, 5 and 10 multiplication tables and connect them to each other.* *Begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.* *Begin to relate multiplication and division facts to fractions and measures (e.g., 40 ÷ 2 = 20, 20 is a half of 40).*	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

Calculations		.	Calculate mathematical statements for x and ÷ within multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs. *Begin to use other x tables and recall x facts, including using related division facts to perform written and mental calculations.*	Write and calculate statements for x and ÷ using multiplication tables they know, including for 2-digit numbers x 1-digit numbers, using mental & progressing to formal methods.
Solve 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 contexts.	Solve problems, including missing number, involving x and ÷, including positive integer scaling problems and correspondence problems.
FRACTIONS				
Recognise & Write		Recognise, find and name $\frac{1}{2}$ as one of two equal parts of an object, shape or quantity *by solving problems.* Recognise, find and name $\frac{1}{4}$ as one of four equal parts of an object, shape or quantity *by solving problems.* *Connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.*	Recognise, find, name, identify and write fractions $\frac{1}{3}, \frac{1}{4}, \frac{2}{4}, \frac{1}{2}$ and $\frac{3}{4}$ of a length, number, shape, set of objects or quantity and know that all parts must be equal parts of the whole. *Connect unit fractions to equal sharing and grouping, to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes. Meet $\frac{3}{4}$ as the first example of a non-unit fraction. Count in fractions up to 10 from any number and using $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line.*	Count up and down in tenths & recognise that tenths arise from dividing object into 10 equal parts and in dividing 1-digit number or quantities by 10. Recognise, find & write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. Recognise and use fractions as numbers (as above).

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Compare			Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.	Recognise and show, using diagrams, equivalent fractions with small denominators. Compare and order unit fractions and fractions with the same deominators.
Calculations			Write simple fractions for example, $\frac{1}{2}$ of 6 = 3	Add and subtract fractions with the same denominator within one whole (for example, 5/7 + 1/7 = 6/7).
		MEASUREMENT		
Describe, Measure, Compare and Solve (All Strands)	Make comparisons between objects relating to size, length, weight and capacity. Compare length, weight and capacity.	Compare, describe and solve practical problems for: lengths and heights, mass/weight, capacity and volume, time. Measure and begin to record the following: lengths and heights, mass/weight, capacity and volume, time. *Move from using and comparing different types of quantities and measures using non-standard units, including discrete (for example, counting) and continuous (for example, liquid) measurement, to using manageable common standard units using measuring tools, such as a ruler, weighing scales and containers.*	Choose and use appropriate standard units *with increasing accuracy, using knowledge of the number system* to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (l/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels. Compare and order length, mass, volume/capacity and record the results using >, < and =. *Use the appropriate language and write using standard abbreviations.* *Compare measures including simple multiples such as 'half as high', 'twice as wide'.* Read scales in divisions of 1s, 2s, 5s and 10s (in the form of a number line or practical situation).	Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)

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Time		Sequence events in chronological order using appropriate language. 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. *Pupils use the language of time, including telling the time throughout the day, first using o'clock and then half past.*	Read, tell and write the time to five minutes, including quarter past/to the hour/half 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. Compare and sequence intervals of time. *Become fluent in telling the time on analogue clocks and recording it.* Read the time on a clock to the nearest 15 minutes.	Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12 & 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 noon am/pm, o'clock, morning, afternoon, midnight. Know the number of seconds in a minute and the number of days in each month, year and leap year and compare durations of events.
Money		Recognise and know the value of different denominations of coins and notes.	Recognise and use symbols for pounds (£) & pence (p), *recording pounds and pence separately;* combine amounts to make a value. Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change. *Become fluent in counting and recognising coins. Read and say amounts of money confidently.* Find and use different combinations of coins that equal the same amounts of money.	Add and subtract amounts of money to give change, using both £ and p in practical contexts

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GEOMETRY				
PROPERTIES OF SHAPE				
Shape Vocabulary	Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'	Recognise and name common 2-D shapes (e.g. Square, circle, triangle). Recognise and name common 3-D shapes (e.g. Cubes, cuboids, pyramids & spheres.	Vertices, edges, faces, symmetry	To identify horizontal and vertical lines and pairs of perpendicular and parallel lines
Recognise 2D and 3D Shapes and Their Properties	Select shapes appropriately: flat surfaces for building, a triangular prism for a roof etc. Combine shapes to make new ones - an arch, a bigger triangle etc. Select, rotate and manipulate shapes in order to develop spatial reasoning skills. Although Shape, Space and Measure has been removed from the ELGs, planning should ensure that 'the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures.'	Recognise, *handle* and name common 2D and 3D shapes *in different orientations/sizes and relate everyday objects fluently.* *Recognise that rectangles, triangles, cuboids and pyramids are not always similar to each other.*	*Handle*, identify and describe the properties of 2D shapes, including number of sides and lines of symmetry in a vertical line. *Handle*, identify and describe the properties of 3D shapes, including number of edges, vertices & faces. Identify 2D shapes on the surface of 3D shapes. *Read/write names for shapes as appropriate for word reading and spelling.* *Handle and name a variety of common 2-D and 3-D shapes including quadrilaterals and polygons, cuboids, prisms and cones, and identify properties of each shape.* *Identify, compare and sort shapes on the basis of their properties and use vocabulary precisely, such as sides, edges, vertices and faces.*	Recognise 3-D shapes in different orientations and describe them

Compare and Classify Shapes	Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.		*Identify*, compare and sort common 2D and 3D shapes and everyday objects *on the basis of their properties and use vocabulary precisely.*	
Draw 2D and Construct 3D Shapes			*Draw lines and shapes using a straight edge.*	Draw 2-D shapes. Make 3-D shapes using modelling materials.
POSITION AND DIRECTION				
Position, Direction and Movement	Understand position through words alone – for example, "The bag is under the table," – with no pointing. Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind'.	Describe position, direction and movement, including whole, half, quarter and three-quarter turns *in both directions and connect clockwise with the movement on a clock face.* *Use the language of position, direction and motion, including: left, right, top, middle, bottom, on top of, in front of, above, between, around, near, close, far, up, down, forwards, backwards, inside and outside.*	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).	
Patterns	Talk about and identify the patterns around them, e.g. stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc. Extend and create ABAB patterns – stick, leaf, stick, leaf. Notice and correct an error in a repeating pattern. Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...' Continue, copy and create repeating patterns.		Order and arrange combinations of mathematical objects and *shapes, including those in different orientations,* in patterns and sequences.	

STATISTICS				
Record, Present and Interpret Data			Interpret and construct simple pictograms, tally charts, block diagrams and simple tables *(e.g. many-to-one correspondence in pictograms with simple ratios 2, 5, 10 scales).* 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. *Record, interpret, collate, organise and compare information.*	Interpret and present data using bar charts, pictograms and tables Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.

Year 2 Working at Greater Depth

The pupil can:

- **read scales* where not all numbers on the scale are given and estimate points in between** **The scale can be in the form of a number line or a practical measuring situation.*
- **recall and use multiplication and division facts for 2, 5 and 10 and make deductions outside known multiplication facts**
- **use reasoning about numbers and relationships to solve more complex problems and explain their thinking e.g. 29 + 17 = 15 + 4 + □; 'together Jack and Sam have £14. Jack has £2 more than Sam. How much money does Sam have?' etc.**
- **solve unfamiliar word problems that involve more than one step e.g. 'which has the most biscuits, 4 packets of biscuits with 5 in each packet or 3 packets of biscuits with 10 in each packet?'**
- **read the time on a clock to the nearest 5 minutes**
- **describe similarities and differences of 2-D and 3-D shapes, using their properties e.g. that two different 2-D shapes both have only one line of symmetry; that a cube and a cuboid have the same number of edges, faces and vertices, but different dimensions.**