

Mathematics Progression – Place Value



Text in normal font indicates the National Curriculum statutory requirements.

Highlighted font indicates the National curriculum non-statutory guidance.

Bold font indicates statement added to aid progression and to secure learning.

Rows shaded in pale blue indicate National Curriculum statutory and non-statutory problem solving and reasoning statements.

Nursery	Reception	1	2	3	4	5	6
Problem Solving							
<ul style="list-style-type: none"> Shows curiosity about numbers by offering comments or asking questions. Shows an interest in number problems. 	<ul style="list-style-type: none"> Begins to identify own mathematical problems based on own interests and fascinations. 	<ul style="list-style-type: none"> Use place value and number facts to solve problems. 	<ul style="list-style-type: none"> Use place value and number facts to solve problems. 	<ul style="list-style-type: none"> Solve number problems and practical problems involving the ideas set out below. 	<ul style="list-style-type: none"> Solve number and practical problems that involve all of the statements set out below and with increasingly large positive numbers. 	<ul style="list-style-type: none"> Solve number problems and practical problems that involve all of the statement set out below. 	<ul style="list-style-type: none"> Solve number problems and practical problems that involve all of the statement set out below.
Counting							
<ul style="list-style-type: none"> Knows that numbers identify how many objects are in a set. Realises not only objects, but anything can be counted, including steps, claps or jumps. 	<p><i>Early Learning Goal</i> <i>Children count reliably with numbers from one to 20,</i></p> <ul style="list-style-type: none"> Counts up to three or four objects by saying one number name for each item. Counts actions or objects which cannot be moved. Counts objects 	<ul style="list-style-type: none"> Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. count in multiples of twos, fives and tens from different multiples. Use ordinal numbers. Indicate a quantity (eg 3 apples, 2 centimeters) 	<ul style="list-style-type: none"> count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward. 	<ul style="list-style-type: none"> Count from 0 in multiples of 4, 8, 50 and 100. Use multiples of 2, 3, 5 and 10 also). 	<ul style="list-style-type: none"> Count in multiples of 6, 7, 9, 25 and 1000. 	<ul style="list-style-type: none"> Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000. 	
				<ul style="list-style-type: none"> Count backwards through zero to include negative numbers. 	<ul style="list-style-type: none"> Count backwards through zero to include negative numbers 1000. 	<ul style="list-style-type: none"> Interpret negative numbers in context. Count forwards and backwards with positive and negative whole numbers, including through zero. 	<ul style="list-style-type: none"> Use negative numbers in context and calculate intervals across zero.

	<p>to 10, and beginning to count beyond 10.</p> <ul style="list-style-type: none"> Counts out up to six objects from a larger group. Counts an irregular arrangement of up to ten objects. Estimates how many objects they can see and checks by counting them. Finds the total number of items in two groups by counting all of them. 	<ul style="list-style-type: none"> Recognise patterns in the number system (eg odd and even). 					
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Understanding Place Value – recognise the place value of digits

<ul style="list-style-type: none"> Sometimes matches numeral and quantity correctly. 		<ul style="list-style-type: none"> Recognise the place value of each digit in a number up to at least 20. 	<ul style="list-style-type: none"> Recognise the place value of each digit in a two-digit number (tens, ones) and partition in different ways eg $23 = 20 + 3$ and $23 = 10 + 13$. Understand 0 as a place holder. 	<ul style="list-style-type: none"> Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) and partition in different ways eg $146 = 100 + 40 + 6$ $146 = 130 + 16$ 	<ul style="list-style-type: none"> Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones) and to 2 decimal place and partition in different ways. 	<ul style="list-style-type: none"> Determine the value of each digit in numbers to at least 1 000 000 and to 2 decimal places and partition in different ways. 	<ul style="list-style-type: none"> Determine the value of each digit in numbers up to 10 000 000 and to 3 decimal places and partition in different ways.
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Understanding Place Value – identify, represent and estimate numbers

<ul style="list-style-type: none"> Beginning to represent numbers using 	<ul style="list-style-type: none"> Recognises numerals 1 to 5. Estimates how many objects they 	<ul style="list-style-type: none"> Identify and represent numbers using objects and pictorial 	<ul style="list-style-type: none"> Identify, represent and estimate numbers using 	<ul style="list-style-type: none"> Identify, represent and estimate numbers using different representations, 	<ul style="list-style-type: none"> Identify, represent and estimate numbers using different representations, 	<ul style="list-style-type: none"> Identify, represent and estimate numbers using different representations, 	<ul style="list-style-type: none"> Identify, represent and estimate numbers using different representations,
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<p>fingers, marks on paper or pictures.</p> <ul style="list-style-type: none"> Shows an interest in representing numbers. 	<p>can see and checks by counting them.</p>	<p>representations including the number line.</p>	<p>different representations, including the number line.</p>	<p>including the number line.</p>	<p>including the number line.</p>	<p>including the number line.</p>	<p>including the number line.</p>
Reading and Writing Numbers							
<ul style="list-style-type: none"> Uses some number names and number language spontaneously. Shows an interest in numerals in the environment. 	<ul style="list-style-type: none"> Recognise some numerals of personal significance. Selects the correct numeral to represent 1 to 5, then 1 to 10 objects. Records, using marks that they can interpret and explain. 	<ul style="list-style-type: none"> Read and write numbers to 100 in numerals. Read and write numbers from 1 to 20 in numerals and words. 	<ul style="list-style-type: none"> Read and write numbers to at least 100 in numerals and in words. 	<ul style="list-style-type: none"> Read and write numbers up to 1000 in numerals and in words. 	<ul style="list-style-type: none"> Read and write numbers to at least 10,000. 	<ul style="list-style-type: none"> Read and write numbers to at least 1,000,000. 	<ul style="list-style-type: none"> Read and write numbers up to 10,000,000.
Comparing and Ordering Numbers							
<ul style="list-style-type: none"> Recites numbers in order to 10. Compares two groups of objects, saying when they have the same number. 	<p><i>Early Learning Goal</i> <i>Children ... place them (numbers) in order and say which number is one more or one less than a given number.</i></p> <ul style="list-style-type: none"> Uses the language of 'more' and 'fewer' to compare two sets of objects. Says the number that is one more 	<ul style="list-style-type: none"> Use the language of; equal to, more than, less than (fewer), most, least. Compare numbers up to 100 supported by objects and pictorial representation. Given a number, identify one more and one less. Identify which numbers are closest to a given number? 	<ul style="list-style-type: none"> Compare and order numbers from 0 up to at least 100. Use <, > and = signs. Find 10 more or less than a given number. Round numbers to at least 100 to the nearest 10. 	<ul style="list-style-type: none"> Compare and order numbers up to 1000. Use <, > and = to compare two calculations using the four operations (addition, subtraction, multiplication and division). Find 10 or 100 more or less than a given number. Round numbers to at least 1000 to the nearest 10 or 100. 	<ul style="list-style-type: none"> Compare and order numbers beyond 1000. Use <, > and = to compare two calculations using the four operations (addition, subtraction, multiplication and division). Find 1000 more or less than a given number. Round any number to the nearest 10, 100 or 1000. 	<ul style="list-style-type: none"> Compare and order numbers to at least 1,000,000 and determine the value of each digit. Use <, > and = to compare two calculations using the four operations (addition, subtraction, multiplication and division). Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000. 	<ul style="list-style-type: none"> Compare and order numbers to at least 10,000,000 and determine the value of each digit. Use <, > and = to compare two calculations using the four operations (addition, subtraction, multiplication and division). Round any whole number to a required degree of accuracy e.g. to the nearest 10, 20 50 etc.

	than a given number. • Finds one more or one less from a group of up to five objects, then ten objects.						
				• Read Roman numerals from I to XII.	• Read Roman numerals to 100 (I to C) and know what over time, the numeral system changed to include the concept of zero and place value.	• Read Roman numerals to 1000 (M) and recognize years written in Roman numerals.	• Revise reading Roman numerals to 1000 (M) and recognize years written in Roman numerals.

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Mathematics Progression – Addition and Subtraction



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Reasoning and Problem Solving							
		Solve one-step problems that involve: <ul style="list-style-type: none"> addition and subtraction; concrete objects pictorial representations; missing number problems such as $7 = \square - 9$ <ul style="list-style-type: none"> quantities. 	Solve problems with addition and subtraction using: <ul style="list-style-type: none"> concrete objects; pictorial representation; numbers; quantities; measures; mental and written methods; missing numbers using inverse. 	Solve problems, including: <ul style="list-style-type: none"> missing number problems; using number facts, place value; more complex addition and subtraction; which of the 4 operations to use and why (from Multiplication and Division). 	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why (including missing numbers).	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why (including missing numbers). Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign and using missing numbers eg $13 + 24 = 12 + 25$; $33 = 5 \times \square$ (from Multiplication and Division).	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. Solve problems involving addition, subtraction, multiplication and division (including those with missing numbers).
Understanding Addition and Subtraction							

<ul style="list-style-type: none"> • Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same. 	<p><i>Early Learning Goal Children... use quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.</i></p> <ul style="list-style-type: none"> • In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting. 	<ul style="list-style-type: none"> • Read, write and interpret mathematical statements involving addition, subtraction and the equals signs. • Realise the effect of adding or subtracting zero. 	<ul style="list-style-type: none"> • Show that addition of two numbers can be done in any order and subtraction of one number from another cannot. • Check calculations, including by adding to check subtraction and adding numbers in a different order to check addition. 				<ul style="list-style-type: none"> • Use knowledge of the order of operations to carry out calculations involving the four operations. • Explore the order of operations using brackets.
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Addition and Subtraction Facts

		<ul style="list-style-type: none"> • Represent and use number bonds and related subtraction facts within 20 in several forms eg. $9 + 7 = 16$; $16 - 7 = 9$; $7 = 16 - 9$). 	<ul style="list-style-type: none"> • Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100 eg use $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ to calculate: $30 + 70 = 100$; $100 - 70 = 30$ and $70 = 100 - 30$. 	<ul style="list-style-type: none"> • Recall and use addition and subtraction facts to 100. 	<ul style="list-style-type: none"> • Recall and use addition and subtraction facts to 1000. • Derive and use addition and subtraction facts for 1 and 10 (up to 1 decimal place). 	<ul style="list-style-type: none"> • Recall and use addition and subtraction facts for 1 to 10 (up to 1 decimal place). 	<ul style="list-style-type: none"> • Recall and use addition and subtraction facts for 0.1 and also numbers 1 to 10 (up to 2 decimal places).
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Calculation Methods

		<ul style="list-style-type: none"> • Add and subtract one-digit and two-digit numbers to 20 including zero using concrete objects, pictorial representation, mentally and a number line (including crossing tens boundary). 	<ul style="list-style-type: none"> • Add and subtract numbers using concrete objects, pictorial representations, mentally and using the number line (crossing tens and hundreds boundary), including: <ul style="list-style-type: none"> - a two-digit number and ones; - a two-digit number and tens; - two two-digit numbers; - adding three one-digit numbers. • Start to record addition and subtraction in columns. 	<ul style="list-style-type: none"> • Add and subtract at least 2 numbers with up to three digits, using formal written methods of columnar addition and subtraction. 	<ul style="list-style-type: none"> • Add and subtract at least 2 numbers with up to 4 digits and decimals with up to two decimal places using the formal written methods of columnar addition and subtraction where appropriate (also in Decimals). 	<ul style="list-style-type: none"> • Add and subtract at least 2 whole numbers with more than 4 digits and decimals with up to two decimal places, including using formal written methods (columnar addition and subtraction) (also in Decimals). 	<ul style="list-style-type: none"> • Add and subtract at least 2 whole numbers with more than 4 digits and decimals with up to 3 decimal places using formal written methods (columnar addition and subtraction) (also in Decimals).
Estimating and Checking							
		<ul style="list-style-type: none"> • Recognise the inverse relationship between addition and subtraction. 	<ul style="list-style-type: none"> • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations. 	<ul style="list-style-type: none"> • Estimate the answer to a calculation and use inverse operations to check answers. 	<ul style="list-style-type: none"> • Estimate and use inverse operations to check answers to a calculation. 	<ul style="list-style-type: none"> • Use estimation, use of inverse and rounding to check answers to calculations and determine in the context of a problem, levels of accuracy. 	<ul style="list-style-type: none"> • Use rounding, use of inverse and estimation to check answers to calculations and determine in the context of a problem, an appropriate degree of accuracy.

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Mathematics Progression – Multiplication and Division



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Reasoning and Problem Solving							
	<i>Early Learning Goal Children solve problems, including doubling, halving and sharing.</i>	Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with support.	Solve problems involving multiplication and division: <ul style="list-style-type: none"> • using materials; • arrays; • repeated addition; • mental methods; • multiplication and division facts; • including problems in contexts; • missing numbers. 	Solve problems, including: <ul style="list-style-type: none"> • missing number problems; • multiplication and division (and interpreting remainders); • positive integer scaling (eg 4 times as high, 8 times as long); • correspondence in which n objects are connected to m objects (eg 3 hats and 4 coats, how many different outfits? 12 sweets shared equally between 4 children; 4 cakes shared 	Solve 2-step problems in context involving multiplying and adding, including using: <ul style="list-style-type: none"> • the distributive law to multiply two digit numbers by one digit; • division (including interpreting remainders); • integer scaling problems; • harder correspondence problems such as n objects are connected to m objects (eg the number of choices of a meal on a menu, or three cakes shared equally 	Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign and using missing number (eg $13 + 24 = 12 + 25$; $33 \square = 5 \times$) (also in Addition and Subtraction) Solve problems involving multiplication and division, including: <ul style="list-style-type: none"> • scaling by simple fractions and problems involving simple rates; 	Solve problems involving addition, subtraction, multiplication and division including those with missing numbers.

				<ul style="list-style-type: none"> equally between 8 children). deciding which of the 4 operations to use and why (also in Addition and Subtraction). 	<ul style="list-style-type: none"> between 10 children. 	<ul style="list-style-type: none"> using knowledge of factors and multiples, squares and cubes. 	
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Understanding Multiplication and Division

		<ul style="list-style-type: none"> Develop understanding of multiplication and division through practical activities. 	<ul style="list-style-type: none"> Understand multiplication as arrays and repeated addition. Understand division as grouping and sharing discrete and continuous quantities and that a division calculation can have a remainder. Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. Use commutativity and inverse relations to develop multiplicative 	<ul style="list-style-type: none"> Understand that division is the inverse of multiplication and vice versa. Use number trios to develop family of facts $ \begin{array}{ccc} & 6 & \\ 2 & \swarrow & \searrow \\ & \text{---} & \\ & 3 & \end{array} $ <p> $3 \times 2 = 6$ $2 \times 3 = 6$ $6 \div 3 = 2$ $6 \div 2 = 3$ </p> <ul style="list-style-type: none"> Use commutativity and associativity eg $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$ 	<ul style="list-style-type: none"> Write statements about the equality of expressions eg use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$. Use number trios to develop family of facts $ \begin{array}{ccc} & 27 & \\ 9 & \swarrow & \searrow \\ & \text{---} & \\ & 3 & \end{array} $ <p> $27 \div 3 = 9$ $27 \div 9 = 3$ $3 \times 9 = 27$ $9 \times 3 = 27$ </p>	<ul style="list-style-type: none"> Distributivity can be expressed as $a(b + c) = ab + ac$. Construct equivalence statements eg $4 \times 35 = 2 \times 2 \times 35$; $3 \times 270 = 3 \times 3 \times 9 \times 10 = 9^2 \times 10$ 	<ul style="list-style-type: none"> Use their knowledge of the order of operations to carry out calculations involving the four operations. Explore the order of operations using brackets eg $2 + 1 \times 3 = 5$ $(2 + 1) \times 3 = 9$
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			<p>reasoning eg $4 \times 5 = 20$, $20 \div 5 = 4$.</p> <ul style="list-style-type: none"> Relate division to fractions and measures eg $40 \div 2 = 20$, 20 is half of 40 				
Multiplication and Division Facts							
		<ul style="list-style-type: none"> Count in multiples of 2, 5, and 10 from different multiples (from Number and Place Value). 	<ul style="list-style-type: none"> Recall and use multiplication and division facts for 2, 5 and 10 multiplication tables and connect them to each other, recognising odd and even numbers. Connect the 10 multiplication table to place value and the 5 times table to the divisions on a clock face. 	<ul style="list-style-type: none"> Recall and use multiplication and division facts for the 3, 4 and 8 times tables. Use multiplication and division facts to derive related facts eg use $3 \times 2 = 6$, $6 \div 3 = 2$, $2 = 6 \div 3$ to derive $30 \times 2 = 60$, $60 \div 3 = 20$, $20 = 60 \div 3$ 	<ul style="list-style-type: none"> Recall multiplication and division facts for times tables up to 12×12. Use place value, known and derived facts to multiply and divide mentally including: <ul style="list-style-type: none"> multiplication by 0 and 1, dividing by 1; multiplying together 3 numbers. 		
Doubling and Halving							
	<p><i>Early Learning Goal</i> Children solve problems, including doubling, halving and sharing.</p>	<ul style="list-style-type: none"> Recall and use doubles of numbers to 20 and corresponding halves. 	<ul style="list-style-type: none"> Recall and use doubles of all numbers to 50. Recall and use halves of 2-digit even numbers to 50. Double multiples of 10 to 100 and find the corresponding halves. Double multiples of 5 to 50 and find 	<ul style="list-style-type: none"> Recall and use doubles of all multiples to 100 and corresponding halves. Double multiples of 10 and 100 to 1000. Develop doubling strategies linked to times tables eg multiply by 4 by 	<ul style="list-style-type: none"> Double and halve any 3-digit number by partitioning. Double any decimal to 1 decimal place. Develop doubling and halving strategies linked to times tables eg multiply by 50 by multiplying by 100 and halving, divide by 	<ul style="list-style-type: none"> Double and halve any decimal to 1 decimal place. Develop doubling and halving strategies linked to times tables eg multiply by 50 by multiplying by 100 and doubling. 	<ul style="list-style-type: none"> Double and halve any number including decimals. Develop doubling and halving strategies linked to times tables eg multiply by 50 by multiplying by 100 and halving, divide by 50 by dividing by

			the corresponding halves.	doubling twice, dividing by 4 by halving twice.	50 by dividing by 100 and doubling.		100 and doubling.
Multiplying and Dividing by 10, 100 and 1000							
			<ul style="list-style-type: none"> Find the effect of multiplying a one- or two-digit number by 10; identify the value of the digits. 	<ul style="list-style-type: none"> Find the effect of multiplying a one- or two-digit number by 10 and 100; identify the value of the digits. 	<ul style="list-style-type: none"> Find the effect of multiplying and 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. 	<ul style="list-style-type: none"> Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. 	<ul style="list-style-type: none"> Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.
Calculation Methods for Multiplication							
		<ul style="list-style-type: none"> Make connections between arrays, number patterns and counting in 2s, 5s and 10s. Through grouping, begin to understand multiplication, doubling numbers and quantities. 	<ul style="list-style-type: none"> Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs. 	<ul style="list-style-type: none"> Write and calculate mathematical statements for multiplication using the multiplication tables that they know. Multiply two-digit numbers by one-digit numbers, progressing to formal written methods of short multiplication. 	<ul style="list-style-type: none"> Multiply two-digit and three-digit numbers by a one-digit number using formal written layout of short multiplication. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
Calculation methods for Division							
		<ul style="list-style-type: none"> Through grouping and sharing small quantities, begin to understand division and leftovers as remainders. 	<ul style="list-style-type: none"> Write and calculate mathematical statements for division using the multiplication tables that they know, 	<ul style="list-style-type: none"> Write and calculate mathematical statements for division using the multiplication tables that they know, 	<ul style="list-style-type: none"> Divide numbers up to 3 digits by a one-digit number using the formal written method of short division and interpret remainders 	<ul style="list-style-type: none"> Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders 	<ul style="list-style-type: none"> Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate,

			including for 2-digit numbers divided by 1-digit numbers grouping on a number line and including remainder.	<ul style="list-style-type: none"> Divide two-digit numbers by one-digit numbers, progressing to formal written methods of short division, which include remainders. 	appropriately for the context.	appropriately for the context (eg $98 \div 4 = \frac{98}{4} = 24 \text{ r } 2 = 24 \frac{1}{2} = 24.5 \approx 25$).	<p>interpreting remainders according to the context</p> <ul style="list-style-type: none"> 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. Use written division methods in cases where the answer has up to two decimal places (from Decimals).
Estimating and Checking							
				<ul style="list-style-type: none"> Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. 	<ul style="list-style-type: none"> Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. 	<ul style="list-style-type: none"> Use estimation, rounding and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. 	<ul style="list-style-type: none"> Use estimation, rounding and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
Properties of Number							
					<ul style="list-style-type: none"> Recognise and use 	<ul style="list-style-type: none"> Identify multiples 	<ul style="list-style-type: none"> Identify common

					factor pairs.	<p>and factors, including finding all factor pairs of a number, and common factors of two numbers.</p> <ul style="list-style-type: none"> • Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. • 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). 	<p>factors, common multiples and prime numbers.</p> <ul style="list-style-type: none"> • Relate common factors to finding equivalent fractions.
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Mathematics Progression – Fractions



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Reasoning and Problem Solving							
		<ul style="list-style-type: none"> Solve problems involving finding $\frac{1}{2}$ and $\frac{1}{4}$ of discrete and continuous quantities, using shapes, objects and quantities. 	<ul style="list-style-type: none"> Use fractions as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. 	<ul style="list-style-type: none"> Solve problems that involve all of the below. 	<ul style="list-style-type: none"> 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. Solve simple measure and money problems involving fractions. 	<ul style="list-style-type: none"> Solve problems involving fractions. Solve problems involving multiplication and division, scaling by simple fractions. 	<ul style="list-style-type: none"> Solve problems involving fractions that mean working backwards (eg if $\frac{1}{4}$ of a length is 36cm, then the whole length is $36 \times 4 = 144\text{cm}$).
Counting in Fractional Steps							
		<ul style="list-style-type: none"> Count in steps of $\frac{1}{2}$. 	<ul style="list-style-type: none"> 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 (eg $1\frac{1}{4}$, $1\frac{2}{4}$ (or $1\frac{1}{2}$), $1\frac{3}{4}$, 2). 	<ul style="list-style-type: none"> Count up and down in tenths. 	<ul style="list-style-type: none"> Count up and down in hundredths. Count using simple fractions both forwards and backwards. 	<ul style="list-style-type: none"> Count forwards and backwards in simple fractional steps including bridging zero. 	<ul style="list-style-type: none"> Count forwards and backwards in a range of fractional steps.
Equivalent Fractions							
			<ul style="list-style-type: none"> Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$. 	<ul style="list-style-type: none"> Recognise and show, using diagrams, equivalent fractions with small 	<ul style="list-style-type: none"> Recognise and show, using diagrams, families of common 	<ul style="list-style-type: none"> Identify, name and write equivalent fractions of a given fraction, represented 	<ul style="list-style-type: none"> Use common factors to simplify fractions;

				denominators.	equivalent fractions. <ul style="list-style-type: none"> Use factors and multiples to recognise equivalent fractions and simplify where appropriate (eg $\frac{6}{9} = \frac{2}{3}$ or $\frac{1}{4} = \frac{2}{8}$). 	visually, including tenths and hundredths. <ul style="list-style-type: none"> Recognise mixed numbers and improper fractions and convert from one form to the other. 	<ul style="list-style-type: none"> Use common multiples to express fractions in the same denomination.
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Comparing and Ordering Fractions

			<ul style="list-style-type: none"> Compare and order $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{2}$. 	<ul style="list-style-type: none"> Compare and order unit fractions and fractions with the same denominators. 	<ul style="list-style-type: none"> Compare and order unit fractions and fractions with the same denominators. 	<ul style="list-style-type: none"> Compare and order fractions whose denominators are all multiples of the same number. 	<ul style="list-style-type: none"> Compare and order fractions, including fractions >1.
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Fractions of Objects, Shapes and Quantities

		<ul style="list-style-type: none"> 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 and combine halves and quarters as part of a whole. 	<ul style="list-style-type: none"> Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity. Write simple fractions eg $\frac{1}{2}$ of 6 = 3. 	<ul style="list-style-type: none"> Recognise, find and write fractions of a discrete set of objects including measures and shapes; unit fractions and non-unit fractions with small denominators. Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators using number line and go beyond 1. 	<ul style="list-style-type: none"> Recognise, find and write fractions of a discrete set of objects including measures and shapes; unit fractions and non-unit fractions with small denominators Extend use of number line to connect fractions, numbers and measures. 	<ul style="list-style-type: none"> Find fractions of numbers, measures and quantities. 	<ul style="list-style-type: none"> Revise finding fractions of numbers, measures and quantities.
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Addition and Subtraction of Fractions

			<ul style="list-style-type: none"> • Add and subtract $\frac{1}{2}$, $\frac{1}{4}$ from a given number to 10 (link to Counting in Fractional Steps). 	<ul style="list-style-type: none"> • Add and subtract fractions with the same denominator within one whole (eg, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$) 	<ul style="list-style-type: none"> • Add and subtract fractions with the same denominator beyond one whole. 	<ul style="list-style-type: none"> • Add and subtract fractions with the same denominator and denominators that are multiples of the same number. • Write mathematical statements >1 as a mixed number (eg $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$) 	<ul style="list-style-type: none"> • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
Multiplying and Dividing Fractions							
						<ul style="list-style-type: none"> • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. 	<ul style="list-style-type: none"> • Multiply simple pairs of proper fractions, writing the answer in its simplest form (eg $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$) • Divide proper fractions by whole numbers (using diagrams) (eg $\frac{1}{3} \div 2 = \frac{1}{6}$) • Associate a fraction with division and calculate decimal fraction equivalents (eg 0.375) for a simple fraction (eg $\frac{3}{8}$)

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Mathematics Progression – Decimals



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Nursery	Reception	1	2	3	4	5	6
Reasoning and Problem Solving							
					Solve simple measure and money problems involving decimals to two decimal places (also in Measurement).	Solve problems involving number up to three decimal places.	Solve problems involving number up to three decimal places. Solve problems which require answers to be rounded to specified degrees of accuracy.
Reading and Writing Decimals							
				• Read and write numbers with one decimal place.	• Read and write numbers with up to two decimal places.	• Read and write numbers with up to three decimal places.	• Read and write numbers with up to three decimal places.
Counting in Decimal Steps							
				• Count up and down in tenths and 0.1	• Count up and down in hundredths and 0.01 • Count using simple decimals both forwards and backwards.	• Count forwards and backwards in simple decimal steps including bridging zero (up to 3 decimal places).	• Count forwards and backwards in a range of decimal steps up to 3 decimal places.
Comparing and Ordering Decimals							

				<ul style="list-style-type: none"> • Compare and order numbers with one decimal place and identify the value of each digit and represent on a number line. 	<ul style="list-style-type: none"> • Order and compare numbers with the same number of decimal places up to two decimals and identify the value of each digit and represent on a number line. 	<ul style="list-style-type: none"> • Order and compare numbers with up to three decimal places and determine the value of each digit. 	<ul style="list-style-type: none"> • Revise ordering and comparing numbers with up to three decimal places and determine the value of each digit.
Rounding Decimals							
					<ul style="list-style-type: none"> • Round decimals with one decimal place to the nearest whole number. 	<ul style="list-style-type: none"> • Round decimals with two decimal places to the nearest whole number and to one decimal place. 	<ul style="list-style-type: none"> • Round decimals with three decimal places to the nearest whole number or one or two decimal places.
Addition and Subtraction Facts for Decimals							
					<ul style="list-style-type: none"> • Derive and use addition and subtraction facts for 1 and 10 (up to one decimal place). 	<ul style="list-style-type: none"> • Recall and use addition and subtraction facts for 1 to 10 (up to 1 decimal place) 	<ul style="list-style-type: none"> • Recall and use addition and subtraction facts for 0.1 and also numbers 1 to 10 (up to two decimal places).
Addition and Subtraction of Decimals							
					<ul style="list-style-type: none"> • Add and subtract decimals with up to two decimal places with using formal written methods (columnar addition and subtraction). 	<ul style="list-style-type: none"> • Add and subtract decimals with up to two decimal places with using formal written methods (columnar addition and subtraction). • Add and subtract decimals, including: <ul style="list-style-type: none"> – a mix of whole numbers and decimals; – decimals with different numbers of decimal places; 	<ul style="list-style-type: none"> • Add and subtract decimals with up to three decimal places with using formal written methods (columnar addition and subtraction). • Add and subtract decimals, including: <ul style="list-style-type: none"> – a mix of whole numbers and decimals; – decimals with different numbers of decimal places;

						- compliments of 1 e.g. 0.83+0.17	- compliments of 1 e.g. 0.83+0.17
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Multiplication and Division of Decimals

							<ul style="list-style-type: none"> • 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. • Divide one-digit numbers with up to two decimal places by 1- and then 2-digit whole numbers.
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Multiplying and Dividing by 10, 100 and 1000

					<ul style="list-style-type: none"> • Find the effect of multiplying and dividing a one- or two-digit numbers by 10 and 100, identifying the value of the digits in the answer as ones, tenths and 	<ul style="list-style-type: none"> • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. 	<ul style="list-style-type: none"> • Multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places.
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					hundredths.		
Equivalent Fractions and Decimals							
				<ul style="list-style-type: none"> Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 	<ul style="list-style-type: none"> Recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten. 	<ul style="list-style-type: none"> Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. 	<ul style="list-style-type: none"> Associate a fraction with division and calculate decimal fraction equivalents (eg 0.375) for a simple fraction (eg $\frac{3}{8}$; $3 \div 8 = 0.375$) Round recurring decimals to three decimal places, or other appropriate approximations depending on the context.

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Mathematics Progression – Percentages



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Nursery	Reception	1	2	3	4	5	6
Reasoning and Problem Solving							
				<ul style="list-style-type: none"> Solve problems involving finding 25%, 50%, and 75% of amounts. 	<ul style="list-style-type: none"> Solve problems involving finding 25%, 50%, and 75% of amounts. 	<ul style="list-style-type: none"> Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25. Solve problems including finding simple percentage of amounts. 	<ul style="list-style-type: none"> Solve problems involving the calculation of percentages (for example, of measures, and such as 15% of 360) and the use of percentages for comparison (from Ratio).
Understanding Percentages							
			<ul style="list-style-type: none"> Recognise the per cent symbol (%) and understand that $50\% = \frac{1}{2}$. 	<ul style="list-style-type: none"> Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'. Understand that $25\% = \frac{1}{4}$, $50\% = \frac{1}{2}$, $75\% = \frac{3}{4}$, $100\% = 1$ 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Write percentages as a fraction with denominator 100, and as a decimal.

Equivalent Fractions, Decimals and Percentages

• **Understand that**
50% = $\frac{1}{2}$

• **Understand that;**
50% = $\frac{1}{2}$ = 0.5
25% = $\frac{1}{4}$
75% = $\frac{3}{4}$

• Recognise and write decimal **and percentage** equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and any number of tenths and hundredths.

• Read and write decimal numbers as fractions **and percentage** eg $0.71 = \frac{71}{100} = 71\%$

• Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Ratio and Proportion

Statements only appear in year 6 but ratio and proportion should be connected to other learning opportunities

- colour mixing;
- compare scale models to life size objects;
- describe patterns 2 red to 3 blue RRBBB;
- fractions;
- making recipes;
- multiplication and division;
- real-life examples ie farm trip – ratio of cows to sheep;
- scale drawings.

• Solve problems involving the relative sizes of two quantities where missing values can be found using integer multiplication and division facts.

• **Use notation a:b**

Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples (eg for every egg you need three spoonfuls of flour; $\frac{3}{5}$ of the class are boys.

• Solve problems involving similar shapes where the scale factor is known or can be found.

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Mathematics Progression – Algebra



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Nursery	Reception	1	2	3	4	5	6
Problem Solving							
		Solve one step missing number problems involving: <ul style="list-style-type: none"> addition and subtraction eg $\square - 9$ (from Addition and Subtraction) number facts; place value. 	Solve missing number problems involving: <ul style="list-style-type: none"> addition and subtraction; multiplication and division; number facts; place value. 	Solve missing number problems involving: <ul style="list-style-type: none"> the 4 operations; number facts; place value. 	Solve missing number problems involving: <ul style="list-style-type: none"> the 4 operations; number facts; place value. 	Solve missing number problems involving: <ul style="list-style-type: none"> the 4 operations; number facts; place value; Use of = to indicate equivalence eg $13 + 24 = 12 + 25$ $33 = 5 \times \square$ missing lengths and angles (from Properties of Shapes) 	Express missing number problems algebraically. Solve missing number problems including: <ul style="list-style-type: none"> 4 operations; number facts; place value; ratio; lengths; angles; co-ordinates.
Function Machines							
		Use one-step function machines using addition and subtraction.	Use one-step function machines using all 4 operations.	Use two-step function machines using all 4 operations.	Use two-step function machines (using all 4 operations including negative numbers).	Use multi-steps function machines starting with an answer (include 4 operations, negative numbers).	Use multi-steps function machines starting with an answer (include 4 operations, negative numbers).
Balance Puzzles							

		<p>Calculate number sentences with one unknown eg</p> $7 = \square - 9$ <p>(from Addition and subtraction)</p>	<p>Calculate number sentences with one or more unknowns which are on one side of the balance eg</p> $\triangle + 3 = 20$ $\square + \square = 35$	<p>Calculate number sentences with two unknowns which are on one side of the balance eg</p> $120 = \triangle \times \circ$ $\square + \square = 460$	<p>Calculate number sentences with two unknowns (including fractions and decimals with 1 decimal place) which are on one side of the balance eg</p> $6.5 = \square + \triangle$ $\circ \times \circ = 400$	<p>Calculate number sentences with two unknowns which are on different sides of the balance eg</p> $\square + 3 = 20 - \triangle$	<p>Find pairs of numbers that satisfy number sentences involving two unknowns</p> $50 - \square = \triangle + 10$
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Formula

					<p>Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit. (from Measurement).</p>	<p>Find missing lengths eg a rectangle with a perimeter of 20cm and sides 2 cm and b cm is $4 + 2b = 20$ (from Measurement).</p>	<p>Use simple formulae.</p> <p>Enumerate all possibilities of combinations of two variables</p> <p>$4a + 6b = 50$</p> <p>Recognise when it is possible to use formulae for area and volume of shapes (from in Measurement).</p>
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Mathematics Progression – Statistics



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Nursery	Reception	1	2	3	4	5	6
Reasoning and Problem Solving							
		Solve one-step questions using information presented in pictograms, tally charts, block diagrams and tables.	Solve one-step leading to two-step questions using information presented in pictograms, tally charts, block diagrams and tables.	Solve one-step and two-step questions [eg '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.	Solve problems from a range of graphical representations.
Interpreting, Constructing and Presenting Data							
		<ul style="list-style-type: none"> Interpret and construct simple pictograms, tally charts, block diagrams and simple tables. Interpret and sort numbers and shapes using Venn and Carroll diagrams (also in Properties of Shapes). 	<ul style="list-style-type: none"> Interpret and construct simple pictograms with simple ratio 2, 5 and 10 tally charts, block diagrams and simple tables. Interpret and sort numbers and shapes using Venn and Carroll diagrams (also in Properties of Shapes). 	<ul style="list-style-type: none"> Interpret and present data using bar charts, pictograms tables, Venn and Carroll diagrams (also in Properties of Shapes). 	<ul style="list-style-type: none"> Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. 	<ul style="list-style-type: none"> Complete, read and interpret information in tables, including timetables Describe which representation of data is most appropriate and why. 	<ul style="list-style-type: none"> Interpret and construct pie charts and line graphs and use these to solve problems (connect to work on angles and fractions). Read graphs to convert Km to miles (also in Measurement).

Reading Scales

		<ul style="list-style-type: none"> • Read the numbered divisions on a scale and interpret the divisions between them (eg on a scale 0-20 with intervals of 1 shown but only the divisions 5, 10, 15, and 20 numbered). 	<ul style="list-style-type: none"> • Read to the nearest division scales that are numbered or partially numbered. 	<ul style="list-style-type: none"> • Understand and use simple scales eg 2, 5, 10 units per cm in pictograms and bar charts. • Read to the nearest division and half division scales that are numbered or partially numbered. 	<ul style="list-style-type: none"> • Understand and use a greater range of scales in representations. • Interpret intervals and divisions on partially numbered scales. 	<ul style="list-style-type: none"> • Understand and use a greater range of scales in their representations. • Interpret a reading that lies between two numbered divisions on a scale. 	<ul style="list-style-type: none"> • Understand and use a greater range of scales in their representations. • Interpret a reading that lies between two numbered divisions on a scale.
Mean, Median, Mode and Range							
					<ul style="list-style-type: none"> • Collate and interpret the mode, median and range. 	<ul style="list-style-type: none"> • Collate and interpret the mode, median and range. 	<ul style="list-style-type: none"> • Calculate and interpret the mean as an average.

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Mathematics Progression – Shape



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Nursery	Reception	1	2	3	4	5	6
Identifying 2D shapes and their properties							
<ul style="list-style-type: none"> Shows an interest in shape and space by playing with shapes or making arrangements with objects. Shows awareness of similarities of shapes in the environment. Shows interest in shape by sustained construction activity or by talking about shapes or arrangements. Shows interest in shapes in the environment. Uses shapes 	<p><i>Early Learning Goal</i> <i>Children recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.</i></p> <ul style="list-style-type: none"> Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes. Selects a particular named shape. Uses familiar objects and common shapes to create and recreate patterns and build models. 	<ul style="list-style-type: none"> Recognise and name common 2-D shapes including: <ul style="list-style-type: none"> rectangles; squares; circles; triangles. Handle 2-D shapes, naming them and related everyday objects. Recognise 2-D shapes in different orientations and sizes. 	<ul style="list-style-type: none"> Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line. Handle and name a wide variety of 2D shapes including quadrilaterals, polygons. 	<p>Identify and describe the properties of 2-D shapes, using:</p> <ul style="list-style-type: none"> accurate language; length of lines; acute and obtuse angles. <ul style="list-style-type: none"> Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. 	<ul style="list-style-type: none"> Identify and describe the properties of 2D shapes: <ul style="list-style-type: none"> language; length of lines; angles; symmetry. 	<ul style="list-style-type: none"> Identify 3-D shapes, including cubes and other cuboids, from 2-D representations. Identify and describe the properties of 2D shapes: 	<ul style="list-style-type: none"> Identify and describe the properties of 2D shapes: <ul style="list-style-type: none"> language; length of lines; angles; symmetry. Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius $d = 2 \times r$

appropriately for tasks. • Beginning to talk about the shapes of everyday objects, e.g. 'round' and 'tall'.							
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Symmetry

				<ul style="list-style-type: none"> Extend knowledge of properties of shape to symmetrical and non symmetrical polygons. 	<ul style="list-style-type: none"> Complete a simple symmetric figure with respect to a specific line of symmetry. Identify lines of symmetry in 2-D shapes presented in different orientations. Draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry. Recognise line symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape. 		
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Identifying 3D shapes and their properties

• Shows an interest in shape and space by playing with	<i>Early Learning Goal</i> <i>Children recognise, create and describe patterns. They</i>	• Recognise and name common 3-D shapes including: - cuboids;	• Identify and describe the properties of 3-D shapes, including the	• Identify and describe the properties of 3-D shapes, including	• Identify and describe the properties of 3-D shapes, including	• Identify and describe the properties of 3-D shapes, including	• Identify and describe the properties of 3-D shapes, including
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<p>shapes or making arrangements with objects.</p> <ul style="list-style-type: none"> Shows awareness of similarities of shapes in the environment. Shows interest in shape by sustained construction activity or by talking about shapes or arrangements. Shows interest in shapes in the environment. Uses shapes appropriately for tasks. Beginning to talk about the shapes of everyday objects, e.g. 'round' and 'tall'. 	<p><i>explore characteristics of everyday objects and shapes and use mathematical language to describe them.</i></p> <ul style="list-style-type: none"> Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes. Selects a particular named shape. Uses familiar objects and common shapes to create and recreate patterns and build models. 	<ul style="list-style-type: none"> cubes; pyramids; spheres. Handle 3-D shapes, naming them and related everyday objects. Recognise 3D shapes in different orientations and sizes. 	<p>number of edges, vertices and faces.</p> <ul style="list-style-type: none"> Handle and name a wide variety of common 3D shapes including cuboids, prisms, and cones. Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]. 	<ul style="list-style-type: none"> number of edges, vertices and faces accurate language length of lines acute and obtuse angles Recognise 3-D shapes in different orientations and describe them. Extend knowledge of properties of shape to symmetrical and non symmetrical polyhedra. 	<p>the number of edges, vertices and faces, length of lines and acute and obtuse angles.</p>	<p>the number of edges, vertices and faces, length of lines and acute and obtuse angles.</p>	<p>the number of edges, vertices and faces, length of lines and acute and obtuse angles.</p>
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Angles

<ul style="list-style-type: none"> Uses positional language. 	<ul style="list-style-type: none"> Can describe their relative position such as 'behind' or 'next to'. 	<ul style="list-style-type: none"> Describe position, direction and movement, including whole, half, quarter and three-quarter turns. (Also in Position and Direction) 	<ul style="list-style-type: none"> Use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as 	<ul style="list-style-type: none"> Recognise angles as a property of shape or a description of a turn. Identify right angles, recognise that two right angles make a half-turn, 	<ul style="list-style-type: none"> Identify acute and obtuse angles and compare and order angles up to two right angles by size . 	<ul style="list-style-type: none"> Know angles are measured in degrees: estimate and compare. acute, obtuse and reflex angles Identify: <ul style="list-style-type: none"> angles at a 	<ul style="list-style-type: none"> Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. Describe the properties of shapes
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			<p>a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise). To include practical contexts eg pupils themselves moving in turns giving instructions to other pupils to do so and programming robots using instructions given in right angles. (from Position and Direction)</p>	<p>three make three quarters of a turn and four a complete turn.</p> <ul style="list-style-type: none"> Identify whether angles are greater than or less than a right angle. Use acute and obtuse. 		<p>point and one whole turn (total 360°)</p> <ul style="list-style-type: none"> angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°) other multiples of 90° <ul style="list-style-type: none"> Use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals. Use symbol for right angle. Use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems. 	<p>and explain how unknown angles and lengths can be derived from known measurements. Express algebraically eg $a = 180 - (b + c)$</p>
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Mathematics Progression – Position and Direction



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Nursery	Reception	1	2	3	4	5	6
Describe and plot positions using coordinates.							
<ul style="list-style-type: none"> Uses positional language. 	<p><i>Early Learning Goal</i> <i>Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.</i></p> <ul style="list-style-type: none"> Can describe their relative position such as 'behind' or 'next to'. 	<ul style="list-style-type: none"> Describe position, direction and movement, including whole, half, quarter and three-quarter turns (also in Properties of Shapes) (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 and connect turning clockwise with movement on a clock face (also in Telling the Time). 	<ul style="list-style-type: none"> 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). To include practical contexts (eg pupils themselves moving in turns giving instructions to other pupils to do so and programming robots using instructions given in right angles (also in Angles). 	<ul style="list-style-type: none"> Recognise that two right angles make a half-turn; three make three quarters of a turn and four a complete turn (from Properties of Shapes). 	<ul style="list-style-type: none"> Describe positions on a 2-D grid as coordinates in the first quadrant. <ul style="list-style-type: none"> Draw a pair of axes in one quadrant with equal scales and integer labels. Plot specified points and draw sides to complete a given polygon. 	<ul style="list-style-type: none"> Describe positions on the full coordinate grid (all four quadrants). Identify the co-ordinates of a missing vertex of a shape on an unlabelled axis. 	<ul style="list-style-type: none"> Describe positions on the full coordinate grid (all four quadrants). <ul style="list-style-type: none"> Draw and label a pair of axes in the 4 quadrants with equal scaling. Draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. These might be expressed algebraically for eg, 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.
Translation and Reflection							
					<ul style="list-style-type: none"> Describe movements between positions as translations of a given unit to the left/right and up/down. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

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Highlighted font indicates the National curriculum non-statutory guidance.

Bold font indicates statement added to aid progression and to secure learning.

Rows shaded in pale blue indicate National Curriculum statutory and non-statutory problem solving and reasoning statements.

Mathematics Progression – Measurement



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Rows shaded in pale blue indicate National Curriculum statutory and non-statutory problem solving and reasoning statements.

Nursery	Reception	1	2	3	4	5	6
Problem Solving							
		<ul style="list-style-type: none"> Solve practical problems for: <ul style="list-style-type: none"> lengths and heights; mass/weight; capacity and volume; time; money. 	<ul style="list-style-type: none"> Solve practical problems for: <ul style="list-style-type: none"> lengths and heights; mass; capacity and volume; time. Solve simple problems in a practical context including addition and subtraction of money of the same unit, including giving change. 	<ul style="list-style-type: none"> Solve practical problems for: <ul style="list-style-type: none"> lengths and heights; mass; capacity and volume; time; money; temperature. 	<ul style="list-style-type: none"> Solve practical problems involving fractions and decimals to 2 decimal places (from Decimals) <ul style="list-style-type: none"> lengths and heights; mass; capacity and volume; time; money; perimeter temperature. (from Decimals) Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. 	<ul style="list-style-type: none"> Use all four operations to solve problems involving measure, using decimal notation: <ul style="list-style-type: none"> length; mass; volume; money using decimal notation scaling; area perimeter time (using conversions) temperature. Solve problems involving converting between units of time. 	<ul style="list-style-type: none"> Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.
Reading Scales							

		<ul style="list-style-type: none"> • Read the numbered divisions on a scale and interpret the divisions between them (eg on a scale 0-20 with intervals of 1 shown but only the divisions 5, 10, 15, and 20 numbered). 	<ul style="list-style-type: none"> • Read to the nearest division scales that are numbered or partially numbered. 	<ul style="list-style-type: none"> • Read to the nearest division and half division scales that are numbered or partially numbered. 	<ul style="list-style-type: none"> • Interpret intervals and divisions on partially numbered scales. 	<ul style="list-style-type: none"> • Interpret a reading that lies between two numbered divisions on a scale. 	<ul style="list-style-type: none"> • Interpret a reading that lies between two numbered divisions on a scale.
Measure and Calculate Length and Height							
		<ul style="list-style-type: none"> • Measure and begin to record lengths and heights, moving from using non-standard units to manageable common standard units. • Use appropriate measuring tools: rulers, metre sticks, measuring tapes and trundle wheels. 	<ul style="list-style-type: none"> • Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm) to the nearest appropriate unit using rulers, metre sticks, measuring tape, trundle wheels. • Draw lines and shapes using a straight edge (from Properties of Shapes). 	<ul style="list-style-type: none"> • Estimate, measure, add and subtract lengths (m/cm/mm). • Connect decimals and rounding to drawing and measuring straight lines in cm in a variety of contexts (from Properties of Shapes). 	<ul style="list-style-type: none"> • Estimate and calculate lengths. 	<ul style="list-style-type: none"> • Use, read and write standard units of length using decimal notation to two decimal places. • Draw accurate lines with a ruler to the nearest 36millimeter (from Properties of Shapes). • Use conventional markings for parallel lines (from Properties of Shapes). 	<ul style="list-style-type: none"> • Use, read and write standard units of length using decimal notation to three decimal places.
Compare and Order Length and Height							
	<i>Early Learning Goal</i> <i>Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities</i>	<ul style="list-style-type: none"> • Compare and describe lengths and heights (for example, long/short, longer/shorter, tall/short, double/half) moving from comparing non- 	<ul style="list-style-type: none"> • Compare and order lengths and record the results using >, < and = • Comparing measures including simple multiples such as 'half as 	<ul style="list-style-type: none"> • Compare lengths (m/cm/mm) including: <ul style="list-style-type: none"> - mixed units eg 2m, 5cm; - simple scaling by integers eg 	<ul style="list-style-type: none"> • Compare a range of different lengths: <ul style="list-style-type: none"> - against each other; - against key benchmarks (eg 1m, 1 km); 		

	<p><i>and objects and to solve problems.</i></p> <ul style="list-style-type: none"> • Orders two or three items by length or height. 	<p>standard units to manageable common standard units.</p>	<p>high'; 'twice as wide'.</p>	<p>twice as long, five times as high.</p>	<p>Order a range of lengths.</p>		
Convert Measures of Length and Height							
				<ul style="list-style-type: none"> • Use simple equivalence of mixed units eg 5m = 500cm. 	<ul style="list-style-type: none"> • Convert between different units of measure (eg kilometre to metre). 	<ul style="list-style-type: none"> • Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre, centimetre and millimetre). 	<ul style="list-style-type: none"> • Convert between standard units, converting measurements of length from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to three decimal places.
Metric and Imperial							
						<ul style="list-style-type: none"> • Understand and use approximate equivalences between metric and common imperial units such as inches. 	<ul style="list-style-type: none"> • Convert between miles and kilometres. • Read graphs to convert kilometers to miles (from Statistics).
Perimeter							
				<ul style="list-style-type: none"> • Measure the perimeter of simple 2-D shapes. 	<ul style="list-style-type: none"> • Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. 	<ul style="list-style-type: none"> • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres. • Find missing 	<ul style="list-style-type: none"> • Recognise that shapes with the same areas can have different perimeters and vice versa.

					<ul style="list-style-type: none"> Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit (also in Algebra). 	lengths eg a rectangle with a perimeter of 20cm and sides 2cm and bcm is $4 + 2b = 20$ (also in Algebra).	
Area							
		<ul style="list-style-type: none"> Find the approximate areas of everyday objects using non-standard units eg measuring leaves and hands with cubes and counters. 	<ul style="list-style-type: none"> Find the approximate area of everyday objects by counting whole squares, $\frac{1}{2}$ squares. 	<ul style="list-style-type: none"> Find the approximate area of everyday objects by counting whole squares, $\frac{1}{2}$ squares and combining squares. 	<ul style="list-style-type: none"> Find the area of rectilinear shapes by counting squares. Relate area to arrays and multiplication. 	<ul style="list-style-type: none"> Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes. Calculate the area from scale drawings using given measurements. Calculate the area of composite rectilinear shapes by splitting into rectangles. 	<ul style="list-style-type: none"> Calculate the area of parallelograms and triangles (also in Algebra). Recognise when it is possible to use the formulae for area of shapes (also in Algebra). Recognise that shapes with the same areas can have different perimeters and vice versa.
Measure and Calculate Mass							
		<ul style="list-style-type: none"> Measure and begin to record mass/weight, moving from using non-standard units to manageable common standard units. Use appropriate measuring tools eg weighing scales. 	<ul style="list-style-type: none"> Choose and use appropriate standard units to estimate and measure mass (kg/g) to the nearest appropriate unit using scales. 	<ul style="list-style-type: none"> Estimate, measure, add and subtract mass (kg/g). 	<ul style="list-style-type: none"> Estimate and calculate mass. 	<ul style="list-style-type: none"> Use, read and write standard units of mass using decimal notation to two decimal places. 	<ul style="list-style-type: none"> Use, read and write standard units of mass using decimal notation to three decimal places.

Compare and Order Mass

	<p><i>Early Learning Goal</i> Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.</p> <ul style="list-style-type: none"> Orders two items by weight or capacity. 	<ul style="list-style-type: none"> Compare and describe mass/weight (for example, heavy/light, heavier than, lighter than) moving from comparing non-standard units to manageable common standard units. 	<ul style="list-style-type: none"> Compare and order mass and record the results using >, < and = Compare measures including simple multiples such as half as heavy, twice as heavy. 	<ul style="list-style-type: none"> Compare mass (kg/g) including: <ul style="list-style-type: none"> mixed units eg 1 kg and 200g; simple scaling by integers eg 3 times as heavy. 	<ul style="list-style-type: none"> Compare a range of different masses. <ul style="list-style-type: none"> against each other; against key benchmarks (eg 100g, 1 kg). Order a range of masses. 		
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Convert Units of Mass

				<ul style="list-style-type: none"> Use simple equivalence of mixed units eg 2kgs = 2000g 	<ul style="list-style-type: none"> Convert between different units of metric measure (eg gram and kilogram). 	<ul style="list-style-type: none"> Convert between different units of metric measure (eg gram and kilogram). 	<ul style="list-style-type: none"> Convert between standard units converting measurement of mass from a smaller unit to a larger unit and vice versa (using decimal notation up to 3 decimal places).
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Metric and Imperial

						<ul style="list-style-type: none"> Understand and use approximate equivalences between metric and common imperial units such as pounds. 	
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Measure and Calculate Capacity and Volume

		<ul style="list-style-type: none"> Measure and begin to record capacity and volume moving from using non-standard units to manageable common standard units. Use appropriate measuring tools eg containers. 	<ul style="list-style-type: none"> Choose and use appropriate standard units to estimate and measure capacity and volume (litres/ml) to the nearest appropriate unit using measuring vessels. 	<ul style="list-style-type: none"> Estimate, measure, add and subtract volume/capacity (l/ml). 	<ul style="list-style-type: none"> Estimate and calculate volume/capacity. 	<ul style="list-style-type: none"> Estimate and calculate volume (for example, using 1 cm³ blocks to build cuboids (including cubes) and capacity (for example, using water). Use, read and write standard units of volume using decimal notation to two decimal places. 	<ul style="list-style-type: none"> Use, read and write standard units of volume using decimal notation to three decimal places. Calculate and estimate volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³) and extending to other units (for example, mm³ and km³). Recognise when it is possible to use the formulae for volume of shapes (also in Algebra).
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Compare and Order Capacity and Volume

		<ul style="list-style-type: none"> Compare and describe capacity and volume (for eg, full/empty, more than, less than, half, half full, quarter), moving from comparing non standard units to manageable common standard units. 	<ul style="list-style-type: none"> Compare and order volume/capacity and record the results using >, < and = Compare measures including simple multiples such as half as full, twice as full. 	<ul style="list-style-type: none"> Compare volume/capacity (l/ml) including: <ul style="list-style-type: none"> mixed units eg 1l and 450ml; simple scaling by integers eg holds 4 times as much 	<ul style="list-style-type: none"> Compare a range of different volumes/capacities: <ul style="list-style-type: none"> against each other against key benchmarks (eg 100ml, 1 L). Order a range of volume/capacity measures. 		<ul style="list-style-type: none"> Compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³) and extending to other units (eg mm³ and km³).
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Convert Units of Capacity and Volume

				<ul style="list-style-type: none"> Use simple equivalence of mixed units eg 3L = 3000ml. 	<ul style="list-style-type: none"> Convert between different units of metric measure (for example, litre and millilitre). 	<ul style="list-style-type: none"> Convert between different units of metric measure (for example, litre and millilitre). 	<ul style="list-style-type: none"> Convert between standard units, converting measurements of volume from a smaller unit to a larger unit and vice versa (using decimal notation up to 3 decimal places).
Metric and Imperial							
						<ul style="list-style-type: none"> Understand and use approximate equivalences between metric and common imperial units such as pints. 	
Temperature							
			<ul style="list-style-type: none"> Choose and use appropriate standard units to estimate and measure temperature to the nearest degree (°C) using thermometers. 	<ul style="list-style-type: none"> Choose and use appropriate standard units to estimate and measure temperature to the nearest degree (°C) using thermometers. 	<ul style="list-style-type: none"> Order temperatures (positive and negative) using a number line. 	<ul style="list-style-type: none"> Order temperatures (positive and negative) using a number line. 	<ul style="list-style-type: none"> Using the number line, add and subtract positive and negative integers for measures such as temperature.
Time - Language and Duration							
	<p><i>Early Learning Goal</i> Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities</p>	<ul style="list-style-type: none"> Recognise and use language relating to dates, including days of the week, weeks, months, seasons and years. Measure and begin to record time (hours, 	<ul style="list-style-type: none"> Know the number of minutes 	<ul style="list-style-type: none"> Use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight. Know the number of seconds in a 	<ul style="list-style-type: none"> Interpret and use information on a 	<ul style="list-style-type: none"> Complete, read and interpret 	

	<p><i>and objects and to solve problems.</i></p> <ul style="list-style-type: none"> • Uses everyday language related to time. • Measures short periods of time in simple ways. 	minutes, and seconds).	in an hour and the number of hours in a day.	minute, and the number of days in each month, year and leap year.	calendar to identify dates in the past or future.	information on timetables.	
Compare durations of time							
	<p><u>Early Learning Goal</u> <i>Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.</i></p> <ul style="list-style-type: none"> • Orders and sequences familiar events. 	<ul style="list-style-type: none"> • Compare and describe time (eg quicker, slower, earlier, later). • Sequence events in chronological order using language eg before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening (also in Algebra - Sequences). 	<ul style="list-style-type: none"> • Compare and sequence intervals of time (also in Algebra – Sequences). 	<ul style="list-style-type: none"> • Record and compare time in terms of seconds, minutes and hours. • Compare durations of events (eg to calculate the time taken by particular events or tasks). 	<ul style="list-style-type: none"> • Compare a range of times using a mixture of analogue/12 hr/24 hr clock. 	<ul style="list-style-type: none"> • Compare a range of times using a mixture of analogue/12 hr/24 hr clock. 	<ul style="list-style-type: none"> • Compare a range of times using a mixture of analogue/12 hr/24 hr clock.
Telling the time							
		<ul style="list-style-type: none"> • Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. • Tell the time during the day. • Make whole, half, quarter, three quarter turns in both directions and 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Tell and write the time from an analogue clock, including: <ul style="list-style-type: none"> - using Roman numerals from I to XII; - 12-hour clock; - 24- hour clock. 	<ul style="list-style-type: none"> • Read and write time on analogue and digital 12- and 24-hour clocks. 	<ul style="list-style-type: none"> • Read and write time on analogue and digital 12- and 24-hour clocks. 	<ul style="list-style-type: none"> • Use, read and write standard units of time.

		connect turning clockwise with movement on a clock face (from Position and Direction).		<ul style="list-style-type: none"> Use digital 12 hour clocks. Estimate and read time with increasing accuracy to the nearest minute. 			
Convert units of time							
					<ul style="list-style-type: none"> Convert between different units of time (eg hour to minute). Convert time between analogue and digital 12- and 24-hr clocks. 	<ul style="list-style-type: none"> Convert between different units of time (eg hour to minute). Convert between analogue and digital 12- and 24-hr clocks. 	<ul style="list-style-type: none"> Convert measurement of time from a smaller unit to a larger unit and vice versa. Introduce to compound units of speed eg miles per hour.
Recognise Money							
	<p><i>Early Learning Goal</i> <i>Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.</i></p> <ul style="list-style-type: none"> Beginning to use everyday language related to money. 	<ul style="list-style-type: none"> Recognise and know the value of different denominations of coins and notes. 	<ul style="list-style-type: none"> Recognise and use symbols for pounds (£) and pence (p). 				
Calculate with Money							
		<ul style="list-style-type: none"> Add together 2 or more coins and notes. 	<ul style="list-style-type: none"> Combine amounts to make a particular value Find different 	<ul style="list-style-type: none"> Add and subtract amounts of money (including mixed units) to give change, 	<ul style="list-style-type: none"> Estimate, compare and calculate money in pounds and pence. 		

			combinations of coins that equal the same amounts of money.	using both £ and p in practical contexts, initially recording £ and p separately, leading to decimal notation when appropriate.			

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