

Goose Green Number: Multiplication and Division Progression

Multiplication and division facts	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Count in multiples of twos, fives and tens.	Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward.	Count from 0 in multiples of 4, 8, 50 and 100	Count in multiples of 6, 7, 9, 25 and 1 000	Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	
			Recognise repeated addition patterns in images and representations of concrete objects	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognizing odd and even numbers.	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.	Recall multiplication and division facts for multiplication tables up to 12×12 at speed	Recall multiplication and division facts for multiplication tables up to 12×12 using unitisation to apply to different place values	
Mental calculations	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				Know that multiplication is an efficient method for repeated addition	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods	Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers	Multiply and divide numbers mentally drawing upon known facts	Perform mental calculations, including with mixed operations and large numbers

				<p>Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</p>		<p>Recognise and use factor pairs and commutativity in mental calculations</p>	<p>Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</p>	<p>Associate a fraction with division and calculate decimal equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)</p>
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Written calculation	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				<p>Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs</p>	<p>Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)</p>	<p>Multiply two-digit and three-digit numbers by a one-digit number using number lines to show the repeated addition steps and bar models to represent the proportion</p> <p>Multiply two-digit and three-digit numbers by a one-digit number using formal written layout</p>	<p>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</p>	<p>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</p>

					Know how to use number lines and bar models to represent division facts		Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	Divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context 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 (copied from Fractions (including decimals))
Properties of Numbers: multiples, factors, primes, square and cube numbers	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						Recognise and use factor pairs and commutativity in mental calculations (repeated)	Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	Identify common factors, common multiples and prime numbers

							<p>Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers</p> <p>Establish whether a number up to 100 is prime and recall prime numbers up to 19</p> <p>Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)</p>	<p>Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. (copied from Fractions)</p> <p>Calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm³) and cubic meters (m³), and extending to other units such as mm³ and km³</p>
Inverse operations, estimation, and checking/predicting answers	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					Estimate the answer to a calculation and use	Estimate and use inverse operations		

					inverse operations to check answers	to check answers to a calculation.		
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Problem Solving Order of operation Inverse operations, estimation, and checking/predicting answers	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			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 problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares, and cubes	Solve problems involving addition, subtraction, multiplication, and division
					Make estimation	<i>Estimate and use inverse operations to check answers to a calculation</i>	Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy

								<p>Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</p>	<p>Solve problems involving similar shapes where the scale factor is known or can be found</p> <p>Use knowledge of the order of operations to carry out calculations involving the four operations</p>
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