

# Mathematics – multiplication and division progression



MULTIPLICATION & DIVISION FACTS						
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5
Begin to count groups of objects knowing the value within the group. e.g. 2 pairs of socks.	Begin to solve problems involving doubling, halving and sharing	count in multiples of twos, fives and tens (copied from Number and Place Value)	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward (copied from Number and Place Value)	count from 0 in multiples of 4, 8, 50 and 100 (copied from Number and Place Value)	count in multiples of 6, 7, 9, 25 and 1 000 (copied from Number and Place Value)	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 (copied from Number and Place Value)
			recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising 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 $12 \times 12$	
MENTAL CALCULATION						
			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 Written 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
		show that multiplication of two numbers can be done in any order		recognise and use factor pairs and commutativity in mental calculations (appears also in	multiply and divide whole numbers and those involving decimals by 10, 100	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g.

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		(commutative) and division of one number by another cannot		Properties of Numbers	and 1000	$\frac{3}{8}$ (copied from Fractions)
WRITTEN CALCULATION						
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5
			calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals (=) signs	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)	multiply two-digit and three-digit numbers by a one-digit number using formal written layout	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
						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

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PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS						
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5
					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. 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 ( $^3$ )

INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS						
				estimate the answer to a calculation and use inverse operations to check answers (copied from Addition and Subtraction)	estimate and use inverse operations to check answers to a calculation (copied from Addition and Subtraction)	

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Nursery	PROBLEM SOLVING					
	Reception	Year 1	Year 2	Year 3	Year 4	Year 5
		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	<div>solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</div> <div>solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</div> <div>solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</div>

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Vocabulary						
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5
pair	Group Share Half Double	Times tables Patterns Equals Groups of	Multiply Multiple Divide Array Odd number Even number	Commutativity Integer Positive integer scaling Remainders	Long multiplication Factor pairs Factor product Distributive law	Decimals Interpret remainders Squared numbers Cubed numbers Prime numbers Composite (non-prime) numbers Common factor