

# Number: Multiplication and Division

Multiplication and Division Facts							
Pre-school	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	explore symmetrical patterns, in which each side is a familiar pattern, linking this to 'doubles'	<b>Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple (copied from Number and Place Value)</b>	<i>count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward</i> (copied from Number and Place Value)	<i>count from 0 in multiples of 4, 8, 50 and 100</i> (copied from Number and Place Value)	<i>count in multiples of 6, 7, 9, 25 and 1 000</i> (copied from Number and Place Value)	<i>count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</i> (copied from Number and Place Value)	
	begin to link even numbers to doubles		recall & use multiplication & division facts for the 2, 5 & 10 multiplication tables, including recognising odd & even numbers	recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables <b>Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number</b>	<b>Recall multiplication and division facts up to 12x12, and recognise products in multiplication tables as multiples of the corresponding number</b>	<b>Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.</b>	
Mental Calculations							
				write & calculate mathematical statements for multiplication & division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental & progressing to formal written	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

				methods (appears also in Written Methods)			
			show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot		recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers)	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	<i>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. <math>\frac{3}{8}</math>)</i> (copied from Fractions)

**Written Calculations**

			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	<b>multiply numbers up to 4 digits by a one- or two-digit number using a formal written method,</b> including long multiplication for two-digit numbers	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
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						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,
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							fractions, or by rounding, as appropriate for the context
							<i>use written division methods in cases where the answer has up to two decimal places</i> (copied from Fractions (including decimals))

<b>Properties Of Numbers: Multiples, Factors, Primes, Square And Cube Numbers</b>							
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					recognise and use factor pairs and commutativity in mental calculations (repeated)	<p><b>identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.</b></p> <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>identify common factors, common multiples and prime numbers</p> <p><i>use common factors to simplify fractions; use common multiples to express fractions in the same denomination</i> (copied from Fractions)</p>
						recognise and use square numbers and cube numbers, and the notation for squared ( <sup>2</sup> ) and cubed ( <sup>3</sup> )	<p><i>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm<sup>3</sup>) and cubic metres (m<sup>3</sup>), and extending to other units such as mm<sup>3</sup> and km<sup>3</sup> (from Measures)</i></p>

Order of Operations							
							use their knowledge of the order of operations to carry out calculations involving the four operations
Inverse Operations, Estimating and Checking Answers							
				<i>estimate the answer to a calculation &amp; use inverse operations to check answers ( from Addition &amp; Subtraction)</i>	<i>estimate and use inverse operations to check answers to a calculation (copied from Addition and Subtraction)</i>		use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
Problem Solving							
	explore ways of making unequal sets equal.	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 <b>Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context.</b>	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
						solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	
						solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	<i>solve problems involving similar shapes where the scale factor is known or can be found (copied from Ratio and Proportion)</i>