

# Number: Multiplication and Division

## MENTAL CALCULATIONS - MULTIPLICATION AND DIVISION

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>ELG: Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.</p>	<ul style="list-style-type: none"> <li>Children count forwards and backwards in 2s, 5s and 10s.</li> </ul>	<ul style="list-style-type: none"> <li>To show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot, <i>to develop multiplicative reasoning.</i></li> <li><i>To begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.</i></li> <li><i>To begin to relate multiplication and division facts to fractions and measures (e.g., <math>40 \div 2 = 20</math>, 20 is a half of 40).</i></li> </ul>	<ul style="list-style-type: none"> <li>To 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 <i>efficient mental methods, for example, using commutativity and associativity</i>, and progressing to formal reliable written methods of <i>short multiplication and division.</i></li> </ul>	<ul style="list-style-type: none"> <li><i>To combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations, e.g. <math>2 \times 6 \times 5 = 10 \times 6 = 60</math>.</i></li> <li><i>To practise mental methods and extend this to three-digit numbers to derive associative facts, (e.g. <math>600 \div 3 = 200</math> can be derived from <math>2 \times 3 = 6</math>)</i></li> <li>To recognise and use factor pairs and commutativity in mental calculations.</li> <li>To 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.</li> </ul>	<ul style="list-style-type: none"> <li>To multiply and divide numbers mentally drawing upon known facts.</li> </ul>	<ul style="list-style-type: none"> <li>To perform mental calculations, including with mixed operations and large numbers.</li> </ul>

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## MULTIPLICATION AND DIVISION FACTS

	<p>To make connections between arrays, number patterns, and counting forwards and backwards in twos, fives and tens.</p> <p><i>Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.</i></p>	<ul style="list-style-type: none"> <li>• <i>To use a variety of language to describe multiplication and division.</i></li> <li>• To count from 0 in multiples of 4, 8, 50 and 100.</li> <li>• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers</li> <li>• <i>To connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face.</i></li> </ul>	<p>To recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables <i>when they are calculating mathematical statements in order to improve fluency.</i></p> <p><i>To connect the 2, 4 and 8 multiplication tables through doubling.</i></p>	<ul style="list-style-type: none"> <li>• To recall multiplication and division facts for multiplication tables up to <math>12 \times 12</math> to aid fluency.</li> <li>• <i>To write statements about the equality of expressions (for example, use the distributive law <math>39 \times 7 = 30 \times 7 + 9 \times 7</math> and associative law <math>(2 \times 3) \times 4 = 2 \times (3 \times 4)</math>).</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>To apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>To continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency.</i></li> </ul>
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## WRITTEN CALCULATIONS - MULTIPLICATION AND DIVISION

		<p>calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (=) signs</p>	<p>To 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 <i>efficient mental methods, for example, using commutativity and associativity</i>, and progressing to formal <i>reliable</i> written methods of <i>short multiplication</i></p>	<ul style="list-style-type: none"> <li>• To multiply two-digit and three-digit numbers by a one-digit number using the formal written layout of <i>short multiplication with exact answers.</i></li> <li>• <i>To become fluent in the formal written method of short division with exact answers.</i></li> </ul>	<ul style="list-style-type: none"> <li>• To multiply numbers up to four digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers fluently.</li> <li>• To divide numbers up to four digits by a one-digit number using the formal written method of short division and</li> </ul>	<ul style="list-style-type: none"> <li>• To multiply multi-digit numbers up to four digits by a two-digit whole number using the formal written method of long multiplication.</li> <li>• To divide numbers up to four digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole</li> </ul>
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			and division. (included in mental calculation section)		interpret remainders appropriately for the context fluently. <ul style="list-style-type: none"> <li>To multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.</li> </ul>	number remainders, fractions, or by rounding, as appropriate for the context. <ul style="list-style-type: none"> <li>To divide numbers up to four digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context. Perform mental calculations, including with mixed operations and large numbers.</li> </ul>
<b>MULTIPLICATION AND DIVISION – ORDER OF OPERATIONS</b>						
						<ul style="list-style-type: none"> <li>To use their knowledge of the order of operations to carry out calculations involving the four operations.</li> </ul>

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PROPERTIES OF NUMBER						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					<ul style="list-style-type: none"> <li>To use and understand the terms <i>factor</i>, <i>multiple and prime</i>, <i>square and cube numbers</i> and use them to construct <i>equivalence statements</i>.</li> <li>To identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.</li> <li>To know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. To establish whether a number up to 100 is prime and recall prime numbers up to 19.</li> <li>To recognise and use square numbers and cube numbers, and the notation for squared (<math>^2</math>) and cubed (<math>^3</math>).</li> </ul>	<ul style="list-style-type: none"> <li>To identify common factors, common multiples and prime numbers.</li> </ul>

# Number: Multiplication and Division

## SOLVE MULTIPLICATION AND DIVISION PROBLEMS

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<ul style="list-style-type: none"> <li>• 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</li> </ul>	<ul style="list-style-type: none"> <li>• solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts</li> </ul>	<ul style="list-style-type: none"> <li>• To solve <i>simple</i> problems <i>in contexts</i>, <i>deciding which of the four operations to use and why</i>. These include missing number problems, involving multiplication and division, including <i>measuring</i> and positive integer scaling problems and correspondence problems in which <math>n</math> objects are connected to <math>m</math> objects.</li> </ul>	<ul style="list-style-type: none"> <li>• To solve <i>two-step</i> problems <i>in contexts</i> 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 <math>n</math> objects are connected to <math>m</math> objects.</li> </ul>	<ul style="list-style-type: none"> <li>• To solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.</li> <li>• To solve problems, <i>including in missing number problems</i>, involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign (<i>to indicate equivalence</i>).</li> <li>• To solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</li> </ul>	<ul style="list-style-type: none"> <li>• To solve problems involving addition, subtraction, multiplication and division.</li> <li>• To use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</li> </ul>