

Number: Multiplication and Division

MULTIPLICATION & DIVISION FACTS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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 12×12	apply all the multiplication tables and related division facts frequently	apply all the multiplication tables and related division facts frequently
MENTAL CALCULATION					
	begin to become familiar with multiplication tables, practice to become fluent in the 2, 5, and 10x tables and connect them to each other	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 (commutative) and division of one number by another cannot	connect the 2, 4 and 8 multiplication tables through doubling continue to practise mental recall of multiplication tables when calculating mathematical statements in order to improve fluency	recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers) practise mental methods and extend this to 3 digit numbers to derive facts e.g. $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) (copied from Fractions)

Number: Multiplication and Division

WRITTEN CALCULATION					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>begin to understand multiplication and division through grouping and sharing small quantities.</p> <p>doubling numbers and quantities.</p> <p>find simple fractions of objects, numbers and quantities</p>	<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 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>
<p>make connections between arrays, number patterns and counting in 2s, 5s and 10s</p>		<p>develop reliable written methods for multiplication and division, starting with calculations of 2 digit numbers by 1 digit numbers and progressing to formal written methods of short multiplication and division</p>	<p>Write statements about the equality of expressions e.g. $39 \times 7 = 30 \times 7 + 9 \times 7$ and $(2 \times 3) \times 4 = 2 \times (3 \times 4)$</p>	<p>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</p>	<p>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</p>
				<p>recognise expressing division with remainders as fractions and decimals e.g. $98 \div 4 = 24 \text{ r } 2 = 24 \frac{2}{4} = 24.5$</p>	<p><i>use written division methods in cases where the answer has up to two decimal places (copied from Fractions (including decimals))</i></p>

Number: Multiplication and Division

PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	use a variety of language to describe multiplication and division		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	identify common factors, common multiples and prime numbers <i>use common factors to simplify fractions; use common multiples to express fractions in the same denomination</i> (copied from Fractions)
				recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) Use and understand the terms factor, multiple, prime number, square number and cube number And connect them to statements e.g. $4 \times 35 = 2 \times 2 \times 35$ $3 \times 270 = 3 \times 3 \times 9 \times 10 = 9^2 \times 10$	<i>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3</i> (copied from Measures)

Number: Multiplication and Division

ORDER OF OPERATIONS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Show that multiplication of 2 numbers can be done in any order (commutative) and division of one number by another cannot		Combine knowledge of number facts and arithmetic rules to solve mental and written calculations e.g. $2 \times 6 \times 5 = 10 \times 6 = 60$		use their knowledge of the order of operations to carry out calculations involving the four operations
INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS					
	begin to relate inverse relations to develop multiplicative reasoning e.g. $4 \times 5 = 20$ $20 \div 5 = 4$	<i>estimate the answer to a calculation and use inverse operations to check answers</i> (copied from Addition and Subtraction)	<i>estimate and use inverse operations to check answers to a calculation</i> (copied from Addition and Subtraction)	use multiplication and division as inverse to support the introduction of ratio in year 6 e.g. converting between units such as km and m	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy

Number: Multiplication and Division

PROBLEM SOLVING					
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	<p>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</p> <p>solve simple problems in context including correspondence problems – e.g. 3 hats and 4 coats, how many different outfits?</p>	<p>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</p> <p>solve 2-step problems in context, choosing the appropriate operation, working with increasingly harder numbers, solving correspondence questions e.g. choices of a meal on a menu, or 3 cakes shared between 10 children</p>	<p>solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</p>	<p>solve problems involving addition, subtraction, multiplication and division</p>
				<p>solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</p>	
				<p>solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</p>	
					<p><i>solve problems involving similar shapes where the scale factor is known or can be found</i> (copied from Ratio and Proportion)</p>