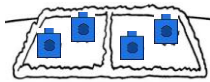




# Multiplication and Division: Overview

**Concepts:** Understanding multiplicative relationships, **Multiplication and division facts**, Calculation strategies, Solving problems

For further guidance see our [Progressions in Calculations](#)

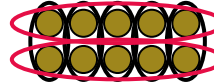


"What can you see, how do you see it?"

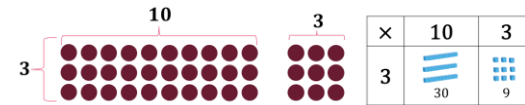


"I can see 2 equal groups of 3!"

"The array shows five equal parts. Each part has a value of two."



"The array shows two equal parts. Each part has a value of five."



## Reception

- Exploration of counting in equal groups
- Understand halving as splitting into two equal groups
- Recall some double facts within 10

## Year 1

- Develop understanding of multiplication as replication of equal groups and of doubling and halving numbers and quantities
- Count in multiples of 2s, 5s and 10s
- Grouping and sharing small quantities
- Solve one-step problems involving multiplication and division using concrete objects, pictorial representations

## Year 2

- Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
- Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- Calculate mathematical statements for multiplication and division and write them using the  $\times$ ,  $\div$  and  $=$  signs
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

## Year 3

- Count from 0 in multiples of 4, 8, 50 and 100
- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- Multiply and divide two-digit numbers by one-digit numbers, using mental and progressing to formal written methods
- Solve problems, including missing number problems, involving multiplication and division

$$8 \overline{) 654} \text{ r } 6$$

"I partition both factors. Next, we multiply the first factor by the ones. Then, we multiply the first factor by the tens. Finally, we both add the partial products."

	H	T	O
		4	2
×		2	3
	1	2	6
+	8	4	0
	9	6	6

$$(42 \times 3)$$

$$(42 \times 20)$$

	2	1	3	2
4	8	5	12	8

Thousands	Hundreds	Tens	Ones
4	2		
	2	3	
	1	2	6
	8	4	0
	9	6	6

	2	1	3
×			3
	6	3	9

Thousands	Hundreds	Tens	Ones
4	2		
	2	3	
	1	2	6
	8	4	0
	9	6	6

## Year 6

- Identify common factors, common multiples and prime numbers
- Use their knowledge of the order of operations to carry out calculations involving the 4 operations
- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- Divide numbers up to 4 digits by a two-digit number using the formal written methods of short division or long division as appropriate, interpreting remainders according to the context
- Perform mental calculations, including with mixed operations and large numbers
- Solve problems involving four operations

## Year 5

- Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 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 ( $^3$ )
- 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
- Multiply and divide numbers mentally, drawing upon known 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
- Multiply and divide whole numbers and decimals by 10, 100 and 1,000
- Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes
- Solve problems involving four operations and problems that involve scaling by simple fractions or involving simple rates

## Year 4

- Count in multiples of 6, 7, 9, 25 and 1000
- Recall multiplication and division facts for multiplication tables up to  $12 \times 12$
- 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
- Recognise and use factor pairs and commutativity in mental calculations
- Multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- 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



# Multiplication and Division: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

Reception → Year 1 → Year 2 → Year 3 → Year 4 → Year 5 → Year 6

## Understanding multiplicative relationships

Multiplicative structures	<p><b>Exploration of how quantities can be distributed equally;</b> Understand halving as splitting into two equal groups <a href="#">Unit 10</a>; <a href="#">Unit 12</a></p>	<p><b>Develop understanding of multiplication as replication of equal groups and of doubling and halving numbers and quantities</b> <a href="#">Unit 15</a></p>	<p><b>Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot</b> <a href="#">Unit 6</a>; <a href="#">Unit 16</a></p>	<p><i>Make connections between the 2, 4 and 8 times tables;</i> <i>Develop understanding of the relationship between multiplication and division, the commutative law and associative law</i> <a href="#">Unit 6</a></p>	<p><i>Continue to develop understanding of the associative law and distributive law.</i> <a href="#">Unit 3</a></p>		<p><b>Use their knowledge of the order of operations to carry out calculations involving the 4 operations</b> <a href="#">Unit 3</a></p>
	<p><i>Throughout all primary years, pupils build their understanding of repeated grouping structures (repeated addition, repeated subtraction/grouping and sharing), correspondence structures and scaling structures (times the size, times smaller, times as many and times fewer). For further guidance see our <a href="#">Progressions in Calculations</a></i></p>						

Factors, multiples, primes and cube numbers				<p><i>Use the language of factors, multiples and products</i> <a href="#">Unit 6</a></p>	<p><b>Recognise and use factor pairs and commutativity in mental calculations</b> <a href="#">Unit 3</a></p>	<p><b>Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers;</b> <b>Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers;</b> <b>Establish whether a number up to 100 is prime;</b> <b>Recall prime numbers up to 19;</b> <b>Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)</b> <a href="#">Unit 4</a>; <a href="#">Unit 13</a> (cube)</p>	<p><b>Identify common factors, common multiples and prime numbers</b> <a href="#">Unit 2</a></p>

	Reception	→	Year 1	→	Year 2	→	Year 3	→	Year 4	→	Year 5	→	Year 6
<b>Multiplication and division facts</b>													
<b>Multiplication tables and related division facts</b>	Recall some double facts within 10 <a href="#">Unit 12</a>		Count in multiples of twos, fives and tens <a href="#">Unit 1 and 4 Do Nows/Transitions; Unit 8; Unit 15</a>		Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward; Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers <a href="#">Unit 1 (transitions) Unit 6; Unit 16</a>		Count from 0 in multiples of 4, 8, 50 and 100; Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables <a href="#">Unit 6; Unit 7</a>		Count in multiples of 6, 7, 9, 25 and 1000; Recall multiplication and division facts for multiplication tables up to $12 \times 12$ <a href="#">Unit 3</a>		Continue to practise multiplication table facts and related division facts through Maths Meetings and/or Arithmetic sessions.		
<b>Multiplying and dividing by powers of ten</b>			Count in multiples of ten <a href="#">Unit 1 and 4 Do Nows/Transitions; Unit 8; Unit 15</a>		Recall multiplication facts for the 10 multiplication table <a href="#">Unit 1 (transitions) Unit 6; Unit 16</a>		Multiply and divide numbers (within 100) by 10 <a href="#">Unit 7</a>		Multiply and divide numbers by 10 and 100 (within 1000) <a href="#">Unit 3</a>		Multiply and divide whole numbers and decimals by 10, 100 and 1,000 <a href="#">Unit 4</a>		Continue to practise multiplying and dividing by powers of ten through Maths Meetings and/or Arithmetic sessions.
<b>Calculation strategies</b>													
<b>Mental Strategies</b>			Grouping and sharing small quantities <a href="#">Unit 15</a>		Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals ( $=$ ) signs <a href="#">Unit 6; Unit 16</a>		Multiply and divide two-digit numbers by one-digit numbers, using mental and progressing to formal written methods <a href="#">Unit 7</a>		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 <a href="#">Unit 3</a>		Multiply and divide numbers mentally drawing upon known facts <a href="#">Unit 4</a>		Perform mental calculations, including with mixed operations and large numbers <a href="#">Unit 2</a>

Reception →

Year 1 →

Year 2 →

Year 3 →

Year 4 →

Year 5 →

Year 6

### Calculation strategies (continued)

Written Strategies

Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals (=) signs  
[Unit 6](#)  
[Unit 16](#)

Multiply and divide two-digit numbers by one-digit numbers, using mental and progressing to formal written methods  
[Unit 7](#)

Multiply two-digit and three-digit numbers by a one digit number using formal written layout;  
[Unit 3](#)  
*Begin to divide 2 and 3 digit numbers by a 1 digit number using short division*  
[Unit 5](#)

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  
[Unit 4](#)

Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication;  
 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  
[Unit 2](#)

### Problem Solving

Problem Solving

Solve one-step problems involving multiplication and division using concrete objects, pictorial representations  
[Unit 15](#)

Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts  
[Unit 6](#)  
[Unit 16](#)

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  
[Unit 7](#) ; [Unit 12](#)

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  
[Unit 5](#)

Solve problems involving:  
 - multiplication and division including using their knowledge of factors and multiples, squares and cubes  
 - addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign  
 -multiplication and division, including scaling by simple fractions and problems involving simple rates  
[Unit 4](#)

Solve problems involving addition, subtraction, multiplication and division  
[Unit 2](#)