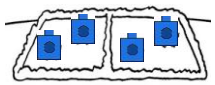
Multiplication and Division: Overview

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

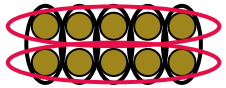
For further guidance see our Progressions in Calculations



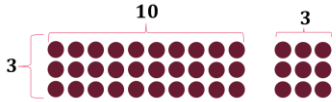
"What can you see, how do you see it?"

"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."



×	10	3
3	30	9

Reception

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

Year 1

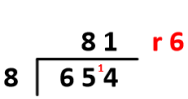
- Develop understanding of multiplication as replication of equal groups and of doubling and halving numbers and quantities
- Count in multiples of 2s, 5s and 10s
- Grouping and sharing small quantities
- Solve one-step problems involving multiplication and division using concrete objects, pictorial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

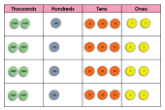
- Count from 0 in multiples of 4, 8, 50 and 100
- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- Multiply and divide two-digit numbers by one-digit numbers, using mental and progressing to formal written methods
- Solve problems, including missing number problems,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



"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	(42 × 3)
+	8	4	0	(42 × 20)
	9	6	6	

		2	1	3	2
	4	8	5	1 2	8



		2	1	3
×				3
		6	3	9

Year 4

- Count in multiples of 6, 7, 9, 25 and 1000
- Recall multiplication and division facts for multiplication tables up to 12 × 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

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 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

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	**Exploration of how quantities can be distributed equally;** *Understand halving as splitting into two equal groups* Unit 10; Unit 12	**Develop understanding of multiplication as replication of equal groups and of doubling and halving numbers and quantities** Unit 15	**Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot** Unit 6; Unit 16	*Make connections between the 2, 4 and 8 times tables; Develop understanding of the relationship between multiplication and division, the commutative law and associative law* Unit 6	*Continue to develop understanding of the associative law and distributive law.* Unit 3		**Use their knowledge of the order of operations to carry out calculations involving the 4 operations** Unit 3
	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 Progressions in Calculations						
Factors, multiples, primes and cube numbers				*Use the language of factors, multiples and products* Unit 6	**Recognise and use factor pairs and commutativity in mental calculations** Unit 3	**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; Recall prime numbers up to 19; Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})** Unit 4; Unit 13 (cube)	**Identify common factors, common multiples and prime numbers** Unit 2

Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Multiplication and division facts						
Multiplication tables and related division facts	**Recall some double facts within 10** Unit 12	Count in multiples of twos, fives and tens Unit 1 and 4 Do Nows/Transitions; Unit 8; Unit 15	**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** Unit 1 (transitions) Unit 6; Unit 16	**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** Unit 6; Unit 7	**Count in multiples of 6, 7, 9, 25 and 1000; Recall multiplication and division facts for multiplication tables up to 12 × 12** Unit 3	*Continue to practise multiplication table facts and related division facts through Maths Meetings and/or Arithmetic sessions.*	
Multiplying and dividing by powers of ten		**Count in multiples of ten** Unit 1 and 4 Do Nows/Transitions; Unit 8; Unit 15	**Recall multiplication facts for the 10 multiplication table** Unit 1 (transitions) Unit 6; Unit 16	*Multiply and divide numbers (within 100) by 10* Unit 7	*Multiply and divide numbers by 10 and 100 (within 1000)* Unit 3	**Multiply and divide whole numbers and decimals by 10, 100 and 1,000** Unit 4	*Continue to practise multiplying and dividing by powers of ten through Maths Meetings and/or Arithmetic sessions.*
Calculation strategies							
Mental Strategies		*Grouping and sharing small quantities* Unit 15	**Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) 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	**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** Unit 3	**Multiply and divide numbers mentally drawing upon known facts** Unit 4	**Perform mental calculations, including with mixed operations and large numbers** Unit 2

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 (×), division (÷) 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