# Calculation Policy

Adopted in January 2022

Updated October 2026

## Progression in Calculations from EYFS to Y6

## Introduction

At the centre of the mastery approach to the teaching of mathematics is the belief that all pupils have the potential to succeed. They should have access to the same curriculum content and, rather than being extended with new learning, they should deepen their conceptual understanding by tackling challenging and varied problems.

Similarly, with calculation strategies, pupils must not simply rote learn procedures but demonstrate their understanding of these procedures through the use of concrete materials and pictorial representations. This document outlines the different calculation strategies that should be taught and used in EYFS to 6, in line with the requirements of the 2014 Primary National Curriculum.

This progression in calculations has been taken from Maths Mastery which is the programme of study for Mathematics at the Alderton Junior School.

Maggie Gordon, Maths Lead

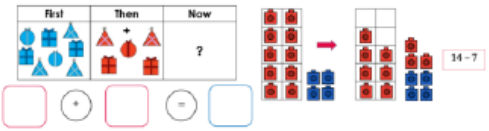
# Addition and Subtraction: Overview

**Concepts:**, Number bonds, Understanding additive relationships Calculation strategies, Solving problems

*For further guidance see our Progressions in Calculations*

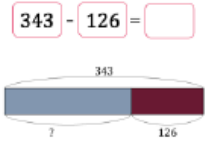


**First** there were four passengers.
**Then** ___ joined the carriage.
**Now** there are ___ passengers.




"I will partition 36 into 30 and 6. I will partition 23 into 20 and 3. I will use my number bonds to help me."




| | | | |
|---|---|---|---|
| | 3 | 4 | 3 |
| − | 1 | 2 | 6 |
| | 2 | 2 | 3 |

### Reception

- Automatically recall number bonds for numbers 0–5 (progressing to some numbers bonds within 10)
- Adding two single digit numbers within 10 by counting all or counting on.
- Subtracting two single digit numbers within 10 by taking away and through partitioning
- Explore additive problems in context using 'first, then now' structure.

### Year 1

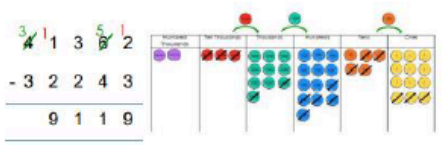
- Represent and use number bonds and related subtraction facts within 20
- Read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
- Add and subtract one-digit and two-digit numbers to 20, including zero, using a range of strategies including: *count all, count on, count back, make ten, partitioning and use of known facts.*
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems

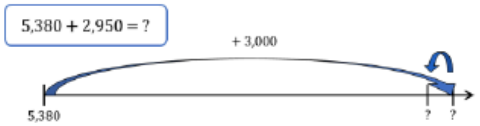
### Year 2

- Recall and use number bonds within 20 fluently, and derive and use related facts up to 100
- Show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: *a two-digit number and 1s, a two-digit number and 10s, 2 two-digit numbers, adding 3 one-digit numbers.*
- Solve problems with addition and subtraction including numbers, quantities and measures

### Year 3

- Estimate the answer to a calculation and use inverse operations to check answers
- Add and subtract mentally including adding 1s, 10s and 100s to a three-digit number
- Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
- Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction







| | | | | |
|---|---|---|---|---|
| | 6 | 2 | 5 | 6 |
| + | 2 | 9 | 3 | 3 |
| | | | | |

### Year 4

- Estimate and use inverse operations to check answers to a calculation
- Apply mental strategies including using known facts to numbers within 10000.
- Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

### Year 5

- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- Add and subtract numbers mentally with increasingly large numbers
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

### Year 6

- Use their knowledge of the order of operations to carry out calculations involving the 4 operations
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
- Perform mental calculations, including with mixed operations and large numbers
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- Solve problems involving all four operations

# Addition and Subtraction: Concept breakdown

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

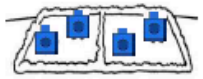
| | Reception → | Year 1 → | Year 2 → | Year 3 → | Year 4 → | Year 5 → | Year 6 |
|---|---|---|---|---|---|---|---|
| | **Number bonds** | | | | | | |
| Recall number bonds | **Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.** Unit 4 (within 5); Unit 9 (within 10) | **Represent and use number bonds and related subtraction facts within 20** Unit 2 (within 10) Unit 5; Unit 7; Unit 9; Unit 13 (within 20) | **Recall and use number bonds within 20 fluently; Derive and use related facts up to 100** Unit 2; Unit 9; Unit 15 | *In KS2 Pupils continue to use and apply known facts to adding and subtracting within larger numbers. E.g. If I know 14 + 5 = 19 Then I know 1400 + 500 = 1900* E.g. Y4 Unit 2 | | | |
| | **Understanding Additive Relationships** | | | | | | |
| Additive structures | | **Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs** Unit 2 Unit 5; Unit 7; Unit 9; Unit 13 | **Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot** Unit 2; Unit 9; Unit 15 | | | | **Use their knowledge of the order of operations to carry out calculations involving the four operations** Unit 3 |
| | *Throughout all primary years, pupils build their understanding of change structures (augmentation and reduction), part-whole structures (aggregation and partitioning) and comparative structures (difference, comparative addition and comparative subtraction). For further guidance see our Progressions in Calculations* | | | | | | |
| Using the inverse and checking answers | | | **Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.** Unit 3 (Do Nows) | **Estimate the answer to a calculation and use inverse operations to check answers** Unit 4 | **Estimate and use inverse operations to check answers to a calculation** Unit 2 | **Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy** Unit 2 | **Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.** Unit 1 |

| | Reception → | Year 1 → | Year 2 → | Year 3 → | Year 4 → | Year 5 → | Year 6 |
|---|---|---|---|---|---|---|---|
| **Calculation Strategies** | | | | | | | |
| Mental strategies | **Adding and subtract two single digit numbers within 10** by counting all or counting on (addition) or taking away or partitioning (subtraction). Unit 9 | **Add and subtract one and two digit numbers (including zero) within 20** *using counting on, Make ten strategy, known facts or partitioning.* Unit 2 (1 digit within 10) Unit 5; Unit 7; Unit 9; Unit 13 | **Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and 1s, a two-digit number and 10s, 2 two-digit numbers, adding 3 one-digit numbers.** Unit 2; Unit 9; Unit 15 | **Add and subtract mentally including adding 1s, 10s and 100s to a three-digit number** Unit 1; Unit 4; Unit 13 | *Apply mental strategies including using known facts to numbers within 10000; add 1000 or subtract to a given number* Unit 2 | **Add and subtract numbers mentally with increasingly large numbers** Unit 2 Unit 11 (with decimals) | **Perform mental calculations, including with mixed operations and large numbers** Unit 2 |
| Written Strategies | . | | *Begin to record addition and subtraction in columns alongside pictorial and concrete representations* Unit 15 | **Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction** Unit 4 | **Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate** Unit 2 | **Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)** Unit 2; Unit 11 (with decimals) | *Apply written methods to problems within 10,000,000* Unit 1 |
| **Solving problems** | | | | | | | |
| Solving problems in context | *Explore additive problems in context using 'first, then now structure'.* Unit 9; Unit 14 | **Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations** Unit 2 Unit 5; Unit 7; Unit 9; Unit 13; Unit 14 | **Solve problems in context of measures and quantities, including problems involving addition and subtraction of money and giving change.** Unit 9; Unit 15 | **Solve problems in context using number facts, place value, and more complex addition and subtraction** Unit 1; (number facts) Unit 4; Unit 11 | **Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why** Unit 2 Unit 10 | **Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why** Unit 2 | **Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why** Unit 1 |
| Missing numbers | | **Solve missing number problems** *(within 10)* Unit 7 | **Solve missing number problems** *(within 100)* Unit 3 (Do Nows); Unit 15 | **Solve missing number problems** *(Within 1000)* Unit 4; Unit 13 | *Pupils should continue to apply additive reasoning to practise missing number problems during their Maths Meetings and/or during their Arithmetic Sessions (Y5/6). See our guidance on Developing Fluency for more information.* | | |

# 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?"

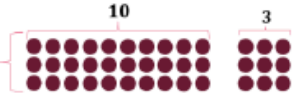


"I can see 2 equal groups of 3!"

"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

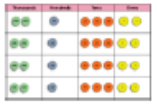
$$8 \overline{)\,65^{1}4} \quad 81\ r\,6$$

"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."

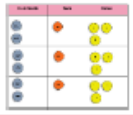
| | H | T | O |
|---|---|---|---|
| | | 4 | 2 |
| × | | 2 | 3 |
| | 1 | 2 | 6 |
| + | 8 | 4 | 0 |
| | 9 | 6 | 6 |

(42 × 3)
(42 × 20)

| | 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

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# 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<br>Unit 6<br>Unit 16 | Multiply and divide two-digit numbers by one-digit numbers, using mental and progressing to formal written methods<br>Unit 7 | Multiply two-digit and three-digit numbers by a one digit number using formal written layout;<br>Unit 3<br>*Begin to divide 2 and 3 digit numbers by a 1 digit number using short division*<br>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;<br><br>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<br>Unit 4 | Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication;<br>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<br>Unit 2 |
| **Problem Solving** | | | | | | | |
| Problem Solving | | Solve one-step problems involving multiplication and division using concrete objects, pictorial representations<br>Unit 15 | Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts<br>Unit 6<br>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<br>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<br>Unit 5 | Solve problems involving:<br>- multiplication and division including using their knowledge of factors and multiples, squares and cubes<br>- addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign<br>-multiplication and division, including scaling by simple fractions and problems involving simple rates<br>Unit 4 | Solve problems involving addition, subtraction, multiplication and division<br>Unit 2 |