



Calculation Policy

Updated February 2025

The aim of this calculation policy is to ensure that both teachers and pupils have a clear understanding of the age appropriate methods required when teaching the four number operations (addition, subtraction, multiplication and division.)

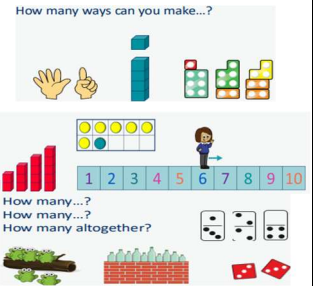
This document ensures that there is a consistent approach across year groups, as well as ensuring that lessons have a well planned progression to build on current understanding. Using a mastery approach (concrete, pictorial, abstract) should ensure that children apply each of these skills in a variety of forms, including reasoning and real life problems in order to ensure a deeper understanding of maths.

Addition

Reception

Children are encouraged to hear and learn rhymes and songs, especially with actions to initiate their counting development and concepts of more than and bigger than. They will develop a deep understanding of numbers to 10, including the composition of each number. They will subitise, automatically recall, number bonds up to 5 and some number bonds to 10, including double facts.

They will begin to understand the concept of addition as the combining of two or more groups using the symbols $+$ and $=$. Children use a wide range of practical representations. Before being ready to add, they need previous experience and an awareness of the value of resources e.g. lots of experience of counting orally and practically.



Year 1

Children are introduced to the concepts of parts and whole and the part-whole model when adding two amounts together.

There are ...
There are ...
There are ... altogether.

... is a part.
... is a part.
... is the whole.

... plus ... is equal to ...
... is equal to ... + ...

4 + 2 = 6
2 + 4 = 6
6 + 4 = 2
6 = 2 + 4

Children understand the concept of addition as the combining of two or more groups and start to look at addition as adding on to a set. They use $+$ and $=$ symbols accurately. Calculations should be written on either side of the $=$, so $=$ isn't just the answer. Children explore number bonds to 10 and use these to make links to related facts to 20.

... is made of ... and ...
... and ... make ...

... can be partitioned into ...
and ...

... plus ... is equal to ...

6 + 0 = 6
5 + 1 = 6
4 + 2 = 6
3 + 3 = 6
2 + 4 = 6
1 + 5 = 6
0 + 6 = 6

I know that ... and ... = ...
so ... and ... = ...

... more than ... is ...
so ... more than ... is ...

What patterns do you notice?
5 + 2 = 7
15 + 2 = 17
7 = 5 + 2
17 = 15 + 2

Children begin to understand that addition can be in any order and begin to find missing numbers.

How many more do you need to make ...?

If ... is the whole and ... is a part, the other part must be ...

... plus ... is equal to ...

2 + \square = 6
6 = 2 + \square

Year 3

Using Diennes, place value counters, 100 squares and other practical equipment to develop addition of 1's, 10's 100's to a three digit number with the focus on mental strategies. Also identifying complements to 100.

The ones/tens/hundreds column will increase by ...

What patterns do you notice?

... plus ... is equal to 100

235 + 3 =
235 + 30 =
235 + 300 =

111 + \square = 118
111 + \square = 181
604 + 90 = 111 + \square = 811

444 + 5 =
444 + 50 =
444 + 500 =

777 + 2 =
777 + 20 =
777 + 200 =

Adding two three digit numbers, beginning with no exchange before progressing onto up to two exchanges. Ensure the children add the ones number first.

... ones + ... ones = ... ones
... tens + ... tens = ... tens
... hundreds + ... hundreds = ... hundreds

345 + 432 =

345 + 432 =

Children will add fractions with the same denominator within 1 whole, making link with known facts. They will also find durations of time between a given start and end point.

$\frac{1}{4}$ + $\frac{1}{4}$ = $\frac{2}{4}$
 $\frac{1}{4}$ + $\frac{1}{4}$ = $\frac{2}{4}$
 $\frac{1}{4}$ + $\frac{1}{4}$ = $\frac{2}{4}$

From ... o'clock to ... o'clock is ... minutes.
From ... o'clock to ... is ... minutes.
The total time taken is ... minutes.

4:25 start
4:55 finish

Year 2

The children are now familiar with the concept of addition, so they will start using a bar model and number line. Adding 1 to any number and then adding 3 one digit numbers. Identifying the addition can be done in any order.

... and ... are a bond to 10
10 + ... = ...

Double ... + ... = ...

What do you notice?
Which addition is the easiest to calculate?
8 + 9 + 1 =
8 + 1 + 9 =
9 + 1 + 8 =

... tens + ... tens = ... tens
... tens and ... ones = ...

To add ... I need to add 10 ... times.

I know that ... and ... = ...
so ... and ... = ...

30 + 20 = 50
34 + 20 = 54

Children will add across a 10, partitioning the number being added to make a full ten. They will also add multiples of 10 to any number, making links to known facts within 10.

The children will add two 2 digit numbers, firstly not across a 10 and then progressing to across a 10. Beginning to exchange 10 ones for 1 ten.

There are ... ones, so I do/do not need to make an exchange.

... ones = ... ten and ... ones

5 ones + 7 ones = 12 ones
12 ones = 1 ten and 2 ones
4 tens + 3 tens + 1 ten = 8 tens
8 tens and 2 ones = 82

Children will solve missing number problems and use the inverse operation to check.

How many more do you need to make ...?

6 + \square = 10
10 - \square = 6

If ... is a whole and ... is a part, then ... is the other part.
 \square + 3 = 7
7 - 3 = \square

... can be partitioned into ... and ...
10 + 8 = 12 + \square

Year 4

Move on to mainly using place value counters. Emphasis on mental strategies including number bonds and related facts.

The ones/tens/hundreds/thousands column will increase by ...

What patterns do you notice?
2,350 + 3 =
2,350 + 30 =
2,350 + 300 =
2,350 + 3,000 =

2,211 + \square = 2,251
2,211 + \square = 2,215
2,211 + \square = 2,511

3,425 + 3 =
3,425 + 30 =
3,425 + 300 =
3,425 + 3,000 =

Formal written method with up to 3 exchanges. Children are encouraged to estimate and use inverse operations to check answers to calculations.

There are ... ones/tens/hundreds so I do/do not need to make an exchange.

I can exchange 10 ... for 1 ...

345 + 432 =

Add decimal numbers in the context of money and fractions that are more than one. Emphasis is on partitioning and use of number lines rather than formal written calculations.

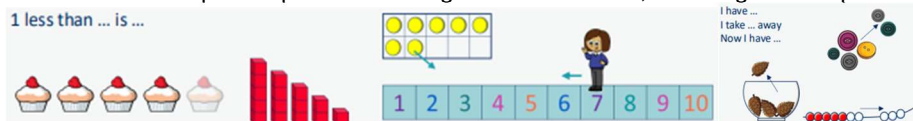
... pence + ... pence = ... pence
... pounds + ... pounds = ... pounds

45p + 25p = 70p
£2 + £3 = £5
£5 + 70p = £5.70

Subtraction

Reception

Children are encouraged to hear and learn rhymes and songs, especially with actions to initiate their counting development and concepts of less than and fewer than. The children need practical methods to solve simple subtractions, they will physically take away the objects to count how many are left. The children will also use a range of objects or drawing pictures to support them. The children will develop a deep understanding of numbers to 10, including the composition of each number.



Year 1

Find a part of a whole, this is linked to number bonds and known facts. $2 + 4 = 6$ so if 6 is the whole and 4 is a part, the other part must be 2.

There are ... in total.
... are ...
How many are not ...?

... is the whole.
... is a part.
... is a part.

... subtract ... is equal to ...
... is equal to ... = ...

$6 - 2 = 4$
 $6 - 4 = 2$

$4 = 6 - 2$
 $2 = 6 - 4$

Children understand the concept of subtraction as taking away so that the quantity is decreased. They use the take away (-) and equals (=) sign. Calculations are written on either side of the equals sign so the = is not just interpreted as the answer.

First... Then... Now...

I start at ...
I jump back ...
I land on ...

... minus ... is equal to ...
... is equal to ... = ...

$6 - 2 = 4$
 $6 - 4 = 2$

$4 = 6 - 2$
 $2 = 6 - 4$

Children focus on the subtraction facts within bonds to 10, before using these related facts to progress to 20, including missing number facts.

... can be partitioned into ...
and ...

I know that ... minus ... = ...
so ... minus ... = ...

... less than ... is ...
so ... less than ... is ...

... minus ... is equal to ...
... is equal to ... = ...

$6 - \square = 2$
 $2 = 6 - \square$

Stage 3

The children will subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds.

The ones/tens/hundreds column will decrease by ...

What patterns do you notice?

Thousands	Hundreds	Tens	Ones
2	3	3	3
2	3	3	0
2	3	0	0

$235 - 3 =$
 $235 - 30 =$
 $235 - 300 =$

$118 - \square = 111$
 $181 - \square = 111$
 $811 - \square = 111$

They will subtract numbers with up to three digits, using formal written methods. Firstly with no exchange, then once they are secure with this method up to two exchanges. The children will use concrete materials such as diennes or place value counters before progressing onto just the abstract written method.

I need to subtract ... ones. I do/do not need to make an exchange.
I need to subtract ... tens. I do/do not need to make an exchange.
I can exchange 1... for 10...

100 minus ... is equal to ...

Children will explore complements to 100, focusing on subtraction facts which can then be used when completing more formal subtraction calculations.

Children will subtract fractions with the same denominator within 1 whole, they will make links with known facts.

When subtracting fractions with the same denominator, only subtract the numerator.
... fifths - ... fifths = ... fifths

$\frac{7}{5} - \frac{3}{5} = \frac{4}{5}$
 $\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$
 $\frac{3}{5} - \frac{1}{5} = \frac{2}{5}$

Year 2

Children subtract ones from any number, including across a 10. They will make links to known number facts as well as partitioning the number so that it bridges through 10.

... can be partitioned into ... and ...

Make links with related facts.

$13 - 5 =$
 $33 - 5 =$

They will subtract multiples of 10 from any number, they are encouraged to make links with known number facts within 10

... tens - ... tens = ... tens
... tens and ... ones = ...

To subtract ... I need to subtract 10 ... times.

I know that ... minus ... = ...
so ... minus ... = ...

$50 - 20 = 30$
 $54 - 20 = 34$

Children complete subtraction calculations involving two 2 digit numbers. Following the CPA approach, they complete calculations initially with no exchange, then when secure the children exchange one 10 for ten 1's.

I need to make an exchange because I do not have enough ones to subtract ... ones.

$43 - 25 =$

3 ones - 5 ones
(I need to exchange 1 ten for 10 ones)

13 ones - 5 ones = 8 ones
3 tens - 2 tens = 1 ten
1 ten and 8 ones = 18

They solve missing number problems, using the inverse operation to check their calculation.

How many do you need to subtract to make ...?

If ... is a whole and ... is a part, then ... is the other part.

... can be partitioned into ... and ...

$10 - \square = 6$
 $6 + \square = 10$

$7 - 3 = \square$
 $\square + 3 = 7$

$18 - \square = 12 + 2$

Year 4

Children will subtract 1s, 10s, 100s and 1,000s from a 4-digit number. They will rely on mental strategies including number bonds and related facts.

The ones/tens/hundreds/thousands column will decrease by ...

What patterns do you notice?

Thousands	Hundreds	Tens	Ones
4	3	5	3
4	3	5	0
4	3	0	0

$4,356 - 3 =$
 $4,356 - 30 =$
 $4,356 - 300 =$
 $4,356 - 3,000 =$

$4,433 - \square = 4,430$
 $\square = 4,033$
 $\square = 4,403$

$3,425 - 2 =$
 $3,425 - 20 =$
 $3,425 - 200 =$
 $3,425 - 2,000 =$

$6,940 - 200 =$
 $6,940 - 300 =$
 $6,940 - 400 =$

They will subtract up to two 4-digit numbers using a formal written method with up to 3 exchanges. Children estimate and use inverse operations to check answers to calculations.

I need to subtract ... ones/tens/hundreds. I do/do not need to make an exchange.

I can exchange 1... for 10...

Children will complete simple problems in the context of money. Focusing on partitioning and use of number lines rather than formal written calculations.

I can partition £... into £... and 100p

£... - £... = £...
100p - ...p = ...p

£5 - £3.26
£4 - £3 = £1
100p - 26p = 74p
£5 - £3.26 = £1.74

They will subtract fractions and mixed numbers with the same denominator, including subtracting fractions from a whole.

When subtracting fractions with the same denominator, only subtract the numerator.
... tenths - ... tenths = ... tenths

$\frac{2}{5} - \frac{1}{5} = \frac{1}{5}$

$\frac{16}{10} - \frac{5}{10} = \frac{11}{10}$
 $\frac{16}{10} - \frac{9}{10} = \frac{7}{10}$

Multiplication

Reception

The children will explore and represent patterns within numbers up to 10, including even and odds, double facts and how quantities can be distributed equally. Explore with the children that double means twice as many and to notice that there are two equal groups. Many opportunities are set up which allow the children to make equal groups.

Double ... is ...
... is double ...

There are ... groups of ...
There are ... altogether.

Year 1

The children begin by counting objects that naturally come in 2s, 5s and 10s, for example pairs of socks or fingers.

There are ... equal groups of ...
There are ... altogether.

Continue to colour in ...
What do you notice?

Complete the number track/number line by counting in ...

Children write a repeated addition calculation to represent equal groups, drawing pictures or using objects.

There are ... groups of ...
There are ... altogether.

10 + 10 + 10 = 30
5 + 5 + 5 + 5 = 20

What is the same? What is different?
2 + 2 + 2 =
5 + 5 + 5 =
10 + 10 + 10 =

Use objects or a drawing to represent the equal groups and find how many in total.

Children use their knowledge of adding equal groups to arrange objects in columns and rows and learn the term 'array'

There are ... rows of ... There are ... altogether.
There are ... columns of ... There are ... altogether.

They understand that doubles are two equal groups and begin to explore doubles beyond 20 manipulatives.

Year 2

Children are encouraged to see the link between repeated addition when calculating multiplication questions. They use the \times and $=$ signs. There are ... equal groups with ... in each group. There are ... altogether.

3 + 3 = 6
2 x 3 = 6

5 + 5 + 5 + 5 = 20
4 x 5 = 20

They use arrays to show that multiplication of two numbers can be done in any order (commutative).

There are ... rows with ... in each row.
There are ... columns with ... in each column.

3 lots of 5 = 15
5 + 5 + 5 = 15

5 lots of 3 = 15
3 + 3 + 3 + 3 + 3 = 15

Children recall and use multiplication facts for the 2, 5 and 10 tables. They are encouraged to identify patterns within the tables. e.g. $x2$ =even

... lots of 5 =
... times 5 is equal to ...

1 x 5 = 5 5 = 1 x 5
2 x 5 = 10 10 = 2 x 5
3 x 5 = 15 15 = 3 x 5

Children use known related facts, including doubles, to complete missing number calculations.

... is equal to ... groups of ...

Double ... is ... so double ... is ...

18 socks, how many pairs?

Double 4 is 8
Double 40 is 80

Year 3

The children recall and use multiplication facts for the 3, 4 and 8 multiplication tables, this will also include retrieval tasks and weekly tables tests. Children are encouraged to notice links between the tables.

... groups of 4 =
... x 4 =
4 ... times =
4 x ... =

... times 4 is equal to ...

3 x 4 = 12 12 = 3 x 4

Children flexibly partition numbers to solve calculations using the expanded method. They will calculate two-digit numbers x one-digit numbers, using mental/related facts before progressing to formal written methods. Without, then when secure, with an exchange. Children will use the formal method of column multiplication alongside concrete representation.

... tens multiplied by ... is equal to ... tens.
... ones multiplied by ... is equal to ... ones.

20 x 4 = 80
4 x 4 = 16
24 x 4 = 96

45 x 3
40 x 3 5 x 3

The children will solve problems, including scaling and correspondence problems in which n objects are connected to m objects.

There are ... times as many ... as ...
For every ... there are ... possible ...
There are ... x ... possibilities altogether.

There are 3 times as many triangles as circles.
For every hat, there are two possible scarves.
3 x 2 = 6
There are 6 possibilities altogether.

Year 4

Children recall multiplication facts for multiplication tables up to 12×12 , this will include daily counting, retrieval tasks and weekly tests. Also they will multiply by 0, 1, 10 and 100

... groups of ... =
... times ... is equal to x ... = ...

When I multiply by 10, the digits move ... place value column to the left. ... is 10 times the size of ...

... x ... =
1 x 1 = 1 1 x 0 = 0
2 x 1 = 2 2 x 0 = 0
3 x 1 = 3 3 x 0 = 0
4 x 1 = 4 4 x 0 = 0

35 x 10 = 350

The children will explore equivalent calculations using factor pairs.

12 = ... x ..., 50 ... x 12 = ... x ... x ...

8 x 6 = 8 x 3 x 2 6 x 8 = 6 x 4 x 2
8 x 6 = 24 x 2 6 x 8 = 24 x 2

They will use related facts as well as mental strategies to complete calculation questions. Also multiplying together 3 one digit numbers

... x ... ones is equal to ... ones
... x ... tens is equal to ... tens
and ... x ... hundreds is equal to ... hundreds.

To work out ... x ... x ... I can first calculate ... x ... and then multiply the answer by ...

3 x 7 = 21 7 x 3 = 21
3 x 70 = 210 7 x 30 = 210
3 x 700 = 2100 7 x 300 = 2100

4 x 2 x 3 = 8 x 3 = 24
2 x 3 x 4 = 6 x 4 = 24
3 x 4 x 2 = 12 x 2 = 24

The short multiplication method is introduced, initially in expanded form. The children will multiply a 2 or 3-digit number by a 1-digit number

To multiply a 2-digit number by ..., I multiply the ones by ... and the tens by ...
To multiply a 3-digit number by ..., I multiply the ones by ..., the tens by ... and the hundreds by ...

The children will solve scaling and correspondence problems involving multiplying. They will include using the distributive law, to multiply two-digit numbers by one digit.

... is ... times the size of ...
For every ... there are ... possibilities.
There are ... x ... possibilities altogether.

	Deep pan	Italian	Thin
Cheese	C DP	C I	C Th
Mushroom	M DP	M I	M Th
Vegetable	V DP	V I	V Th
Chicken	C DP	C I	C Th
Tuna	T DP	T I	T Th

A computer mouse costs £7
A keyboard costs 6 times as much. $5 \times 3 = 15$

Division

Early Methods

A wide range of practical activities encourage children to check whether items have been shared fairly and equally. The children will have lots of first hand experiences of sharing and grouping objects. The children are encouraged to check that each group has the same amount. Children start by sharing objects (given in context) into equal groups.

There are ... altogether.

They are shared equally between ... groups.



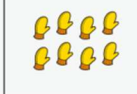
Year 1

Children begin to understand the concept of division as sharing. When confident they start to investigate the concept of division by grouping. They will use a range of equipment and images to show division as equal. Solving simple one-step problems, using concrete objects, pictorial representations and arrays.

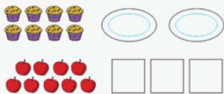
There are ... altogether. How many groups of ... can you make?



Circle groups of 2. There are ... groups of 2



... have been shared equally between... There are ... on/in each ...

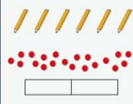


They will recognise, find and name a half as one of two equal parts of a quantity then find and name a quarter as one of four equal parts of an object, shape or quantity.

To find half, I need to share into 2 equal groups.



Half of ... is ...



If ... is half, what is the whole?



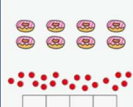
4 is half of ...

There are ... in each group.

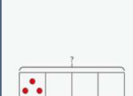
To find a quarter, I need to share into 4 equal groups.



A quarter of ... is ...



If ... is one quarter, what is the whole?

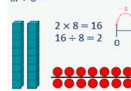


3 is one quarter of ...

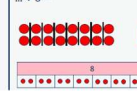
Year 3

Children recall and use division facts for the 3, 4 and 8 multiplication tables. They compare the grouping and sharing structures of division and make links with times-table facts.

There are ... groups of 8 in ...



... has been shared equally into 8 equal groups.



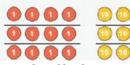
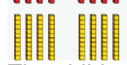
$2 \times 8 = 16$
 $16 \div 8 = 2$

$2 \times 8 = 16$
 $16 \div 8 = 2$

They write and calculate mathematical statements for division using the multiplication tables that they know.

... \div ... is equal to ...

so ... tens \div ... is equal to ... tens.



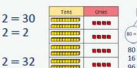
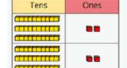
$12 \div 3 = 4$

$120 \div 3 = 40$

The children divide a 2-digit number by a 1-digit number (no exchange), before progressing onto remainders. Numbers are flexibly partitioned into tens and ones to divide then recombined.

... tens divided by ... is equal to ... tens.

... ones divided by ... is equal to ... ones.



$60 \div 2 = 30$

$4 \div 2 = 2$

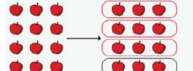
$64 \div 2 = 32$

Children explore division, finding unit and non-unit fractions of a set of objects. Bar models are useful to show the link between division and fractions.

Bar models are useful to show the link between division and fractions.

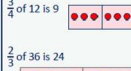
The whole is divided into ... equal parts.

Each part is $\frac{1}{n}$ of the whole.

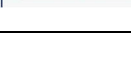


$\frac{1}{n}$ of ... is ... so $\frac{1}{n}$ of ... is ...

$\frac{3}{4}$ of 12 is 9



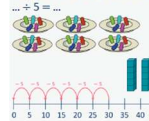
$\frac{2}{3}$ of 36 is 24



Year 2

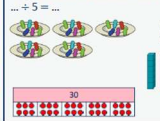
Children continue to understand division as both 'sharing' and 'grouping'. The \div symbol is introduced. They recall and use division facts for the 2, 5 and 10 times tables. Comparing the grouping and sharing structures of division and to make links with times-table facts.

There are ... equal groups of 5



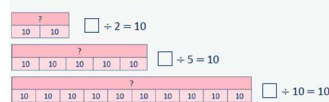
$6 \times 5 = 30$
 $30 \div 5 = 6$

... shared equally between 5 is ...



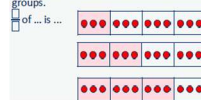
$6 \times 5 = 30$
 $30 \div 5 = 6$

When completing missing number calculations, bar models are used to show the link between \times and \div divided by $\frac{2}{5}/10$ is equal to ...

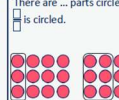


They explore unit & non-unit fractions, focusing on finding $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{3}{4}$. Using bar models to show the link between division and finding a fraction. Recognising that $\frac{2}{4}$ and $\frac{1}{2}$ are equivalent.

The objects have been shared fairly into ... groups.



There are ... equal parts.

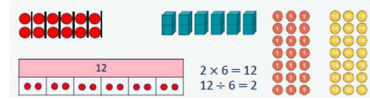


Year 4

The children will recall division facts for multiplication tables up to 12×12 , including related facts.

... has been shared equally into ... equal groups. ... \div ... is equal to ...

so ... tens \div ... is equal to ... tens and ... hundreds \div ... is equal to ... hundreds.



$21 \div 7 = 3$

$210 \div 7 = 30$

$2,100 \div 7 = 300$

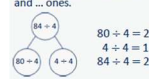
$21 \div 3 = 7$

$210 \div 3 = 70$

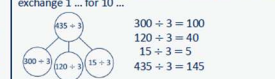
$2,100 \div 3 = 700$

They will divide a 2 or 3-digit number by a 1-digit number, progressing from divisions with no exchange, to divisions with exchange and then divisions with remainders. Place value counters will be used to ensure the method is fully understood.

I can partition ... into ... tens and ... ones.



I cannot share the hundreds/tens equally, so I need to exchange 1 ... for 10 ...



$84 \div 4 = 21$

$80 \div 4 = 20$

$4 \div 4 = 1$

$84 \div 4 = 21$

$300 \div 3 = 100$

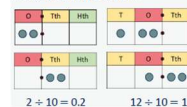
$120 \div 3 = 40$

$15 \div 3 = 5$

$435 \div 3 = 145$

They will find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths. The children are encouraged to notice that dividing by 100 is the same as dividing by 10 twice.

When I divide by 10, the digits move 1 place value column to the right. ... is one-tenth the size of ...



When I divide by 100, the digits move 2 place value columns to the right. ... is one-hundredth the size of ...



$2 \div 10 = 0.2$

$12 \div 10 = 1.2$

$2 \div 100 = 0.02$

$12 \div 100 = 0.12$