North Cadbury C of E Primary School

Written Calculation Policy

Progression Towards a Standard Written Method of Calculation

Introduction

This calculation policy has been written in line with the programmes of study taken from the revised National Curriculum for Mathematics (2014). It provides guidance on appropriate calculation methods and progression. The content is set out in yearly blocks under the following headings: addition, subtraction, multiplication and division.

Statements taken directly from the programmes of study are listed in bold at the beginning of each section.

Children will use mental methods as their first port of call when appropriate, but for calculations that they cannot do in their heads, they will need to use an efficient written method accurately and with confidence.

Aims of the Policy

- To ensure consistency and progression in our approach to calculation
- To ensure that children develop an efficient, reliable, formal written method of calculation for all operations
- To ensure that children can use these methods accurately with confidence and understanding

How to use this Policy

- Use the policy as part of your planning but ensure you use previous or following years' guidance to allow for personalised learning
- Always use Assessment for Learning to identify suitable next steps in calculation for groups of children
- Always use suitable resources, models and images to support children's understanding of calculation and place value, as appropriate
- Encourage children to make sensible choices about the methods they use when solving problems

Stages in Addition

Addition - Early Stages (EYFS)

Children will engage in a wide variety of songs and rhymes, games and activities.

They will begin to relate addition to combining two groups of objects, first by counting all and then by counting on from the largest number.

They will find one more than a given number.

In practical activities and through discussion they will begin to use the vocabulary involved in addition.

'You have five apples and I have three apples. How many apples altogether?'

Addition - Year One

- Given a number, identify one more
- Read, write and interpret mathematical statements involving addition (+) and the equals (=) sign
- Add one- digit and two-digit numbers within 20, including zero
- Solve missing number problems eg 10 +☐ = 16

Children will continue to practise counting on from any number e.g. 'Put five in your head and count on four.'

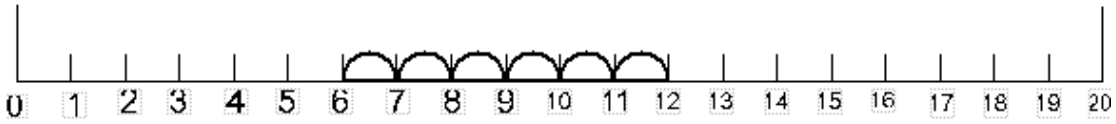
Initially use a number line to count on for addition, counting on from the largest number:

5 + 4 = 9

'Put your finger on number five. Count on (count forwards) four.'

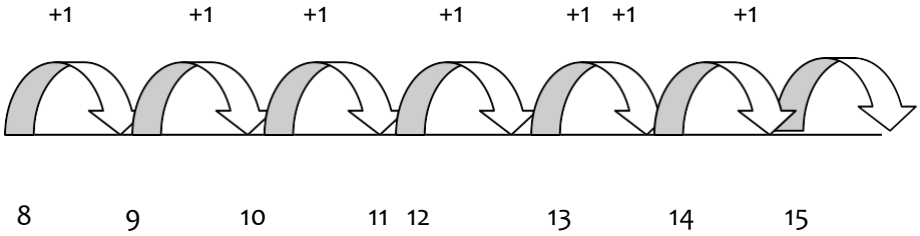
Then progress to a marked number line:

6 + 6 = 12



'Put your finger on number six and count on six.'

8 + 7 = 15 'Put your finger on number eight and count on seven.'



Continue to practise counting on from the largest number for addition with totals within 20.

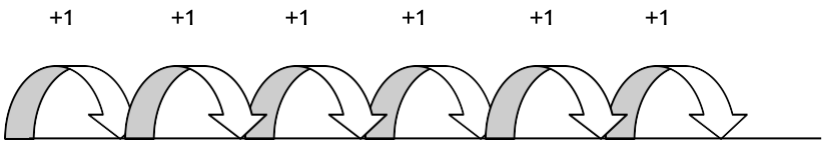
Addition - Year Two

- Add numbers using concrete objects, pictorial representations, and mentally, including:

- A two digit number and ones
- A two digit number and tens
- Two two-digit numbers
- Three one-digit numbers

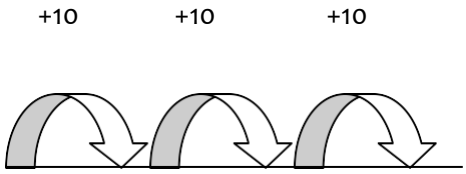
Counting on in ones using an empty number line, within 100:

28 + 6 = 34



…and in tens

28 + 30 = 58

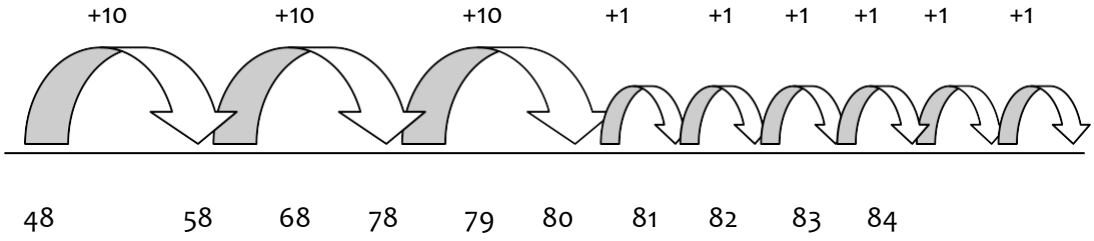


Use in conjunction with a 100 square to show jumps of tens.

48 + 36 = 84

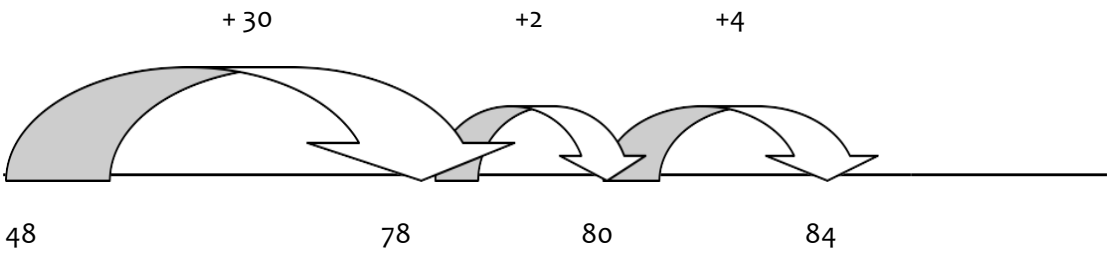
'Put the biggest number first (48), and then partition the smaller number (36 = 30 + 6) and count on:

48 + 30 + 6.'



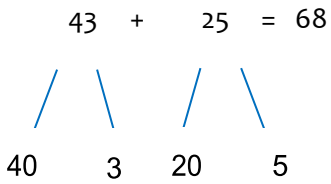
Use in conjunction with a 100 square to show jumps of tens and ones.

If children are confident, use more efficient jumps:



Use in conjunction with a 100 square to show jumps of tens and ones/units.

Also use the partitioning method to add two two-digit numbers:



40 + 20 = 60

3 + 5 = 8

60 + 8 = 68

'Partition the numbers into tens and ones/units.

Add the tens together and then add the ones/units together. Recombine to give the answer'.

Then move on to calculations that bridge the tens:

48 + 36 = 40 + 8 + 30 + 6

40 + 30 = 70

8 + 6 = 14

70 + 14 = 84

48 + 36 = 84

This is an alternative way of recording the partitioning method.

Further develop addition with numbers that bridge 100, using a 200 grid to support.

Addition - Year Three

- Add numbers with up to three digits, using formal written method of columnar addition

Introduce the expanded written method with the calculation presented both horizontally and vertically (in columns).

Initially use calculations where it has not been necessary to bridge across the tens or hundreds:

63 + 32 = 95

60 + 3
\+ 30 + 2
90 + 5 = 95

'Partition the numbers into tens and ones/units. Add the tens together and then add the ones/units together. Recombine to give the answer.'

Then…

6 3
\+ 3 2
5 (3 + 2)

9 0 (60 + 30)
9 5

Add the least significant digits (units) together first and then the tens in preparation for the formal written method.

This will lead into the formal written method:

6 3
\+ 3 2
9 5

Use the language of place value to ensure understanding: 'Three add two equals five. Write five in the units column. 60 add 30 equals 90. Write 9 (90) in the tens column.

Then introduce calculations where it is necessary to bridge, returning to an expanded method initially:

68 + 24 = 92

60 + 8
\+ 20 + 4
80 +12 = 92

'Partition the numbers into tens and ones/units. Add the tens together and then add the ones/units together.

Recombine to give the answer.'

Then…

6 8
\+ 2 4
1 2 (8 + 4)
8 0 (60 + 20)
9 2

Add the least significant digits (units) together first and then the tens in preparation for the formal written method.

Introduce the formal written method, where it is necessary to 'carry' ten from the units to the tens column:

6 8
\+ 2 4
9 2
1

Use the language of place value to ensure understanding: 'Eight add four equals 12. Write two in the units column and 'carry' one (10) across into the tens column. 60 add 20 and the ten that we 'carried' equals 90. Write 9 (90) in the tens column. 92 is the answer.

The digit that has been 'carried' should be recorded under the line in the correct column.

Extend with examples where it is necessary to bridge across the tens and the hundreds:

76 + 47 = 123

70 + 6
\+ 40 + 7
110 +13 = 123

Then:

```
  7 6
+ 4 7
  1 3     (7 + 6)
1 1 0     (70 + 40)
1 2 3
```

Add the least significant digits (units) together first and then the tens in preparation for the formal written method.

Introduce the formal written method, where it is necessary to 'carry' across the columns and bridge 100:

76 + 47 = 123

```
  4 7
+ 7 6
1 2 3
1 1
```

Use the language of place value to ensure understanding: 'Seven add six equals 13. Write three in the units column and 'carry' one (10) across into the tens column. 40 add 70 and the ten that we 'carried' equals 120. Write 2 (20) in the tens column and 'carry' one (100) across into the hundreds column (100).

The digits that have been 'carried' should be recorded under the line in the correct column.

Further develop with the addition of a three- digit number and a two -digit number:

178 + 43 = 221

```
  1 7 8
+   4 3
  2 2 1
  1 1
```

Addition - Year Four

- Add numbers with up to 4 digits using the formal written method of columnar addition where appropriate.

Further develop the formal written method of addition, with three-digit numbers:

176 + 147 = 323

```
  1 7 6
+ 1 4 7
    1 3   (7 + 6)
  1 1 0   (70 + 40)
  2 0 0   (100 + 100)
  3 2 3
```

This will lead into the formal written method:

176 + 147 = 323

```
  1 4 7
+ 1 7 6
  3 2 3
  1 1
```

Use the language of place value to ensure understanding:

'Seven add six equals 13. Write three in the units column and 'carry' one across into the tens column (10). 40 add 70 and the ten that we carried equals

Write 2 in the tens column (20) and 'carry' 1 across into the hundreds column (100). 100 add 100 and the 100 that has been carried equals 300. Write 3 in the hundreds column (300).

The digits that have been 'carried' should be recorded under the line in the correct column.

Introduce the addition of a four-digit number and a three digit number:

1845 + 526 = 2371

```
  1 8 4 5
+   5 2 6
  2 3 7 1
  1   1
```

Continue to develop with addition of two four-digit numbers and with decimals (in the context of money or measures).

Addition - Year Five

- Add whole numbers with more than 4 digits, including using formal written method (columnar addition)

Continue to develop the formal written method for addition with larger numbers (and decimal numbers) and with the addition of three or more numbers:

21848 + 1523 = 23371

```
  21848
+  1523
 23371
   1 1
```

Continue to use the language of place value to ensure understanding. Ensure that the digits that have been 'carried' are recorded under the line in the correct column.

Use the formal written method for the addition of decimal numbers:

£154.75 + £233.82 = £388.57

```
  154·75
+ 233·82
  388·57
     1
```

Continue to use the language of place value to ensure understanding. Ensure that the decimal points line up.

Continue to practise and apply the formal written method throughout Y5.

Addition - Year Six

No objectives have been included in the programmes of study explicitly related to written methods for addition in Y6. However, there is an expectation that children will continue to practise and use the formal written method for larger numbers and decimals and use these methods when solving problems, when appropriate (see previous year's guidance for methods).

Our aim is that by the end of Y6, children use mental methods (with jottings) when appropriate, but for calculations that they cannot do in their heads, they use an efficient formal written method accurately and with confidence.

Stages in Subtraction

Subtraction - Early Stages (EYFS)

Children will engage in a variety of counting songs and rhymes and practical activities.

In practical activities and through discussion they will begin to use the vocabulary associated with subtraction.

They will find one less than a given number.

They will begin to relate subtraction to 'taking away' using objects to count 'how many are left' after some have been taken away.

6 – 2 = 4 

'Take two apples away. How many are left?'

Children will begin to count back from a given number.

Subtraction - Year One

- Given a number, identify one less
- Read, write and interpret mathematical statements involving subtraction (-) and the equals (=) sign
- Subtract one- digit and two-digit numbers within 20, including zero
- Solve missing number problems eg 20 - ☐ = 15

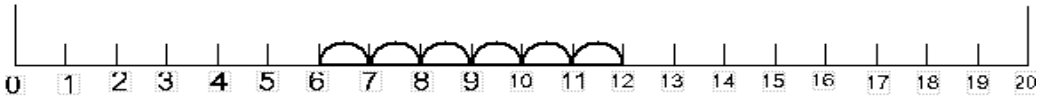
Children will continue to practise counting back from a given number. Initially use a number line to count back for subtraction:

9 – 5 = 4

'Put your finger on number nine. Count back five.'

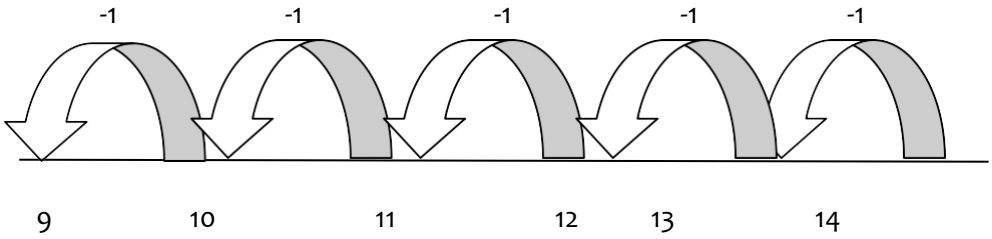
Then progress to a marked number line:

12 - 6 = 6



'Put your finger on number twelve and count back six.'

14 – 5 = 9



'Put your finger on number 14 and count back five.'

Continue to practise counting back for subtraction with numbers within 20.

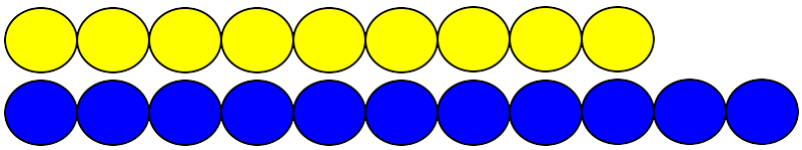
Counting on to find a small difference:

Introduce complementary addition to find differences (only use for small differences).

The use of models is extremely important here to understand the idea of "difference".

Count up from the smallest number to the largest to find the difference using resources, e.g. cubes, beads, number lines/lines:

11 – 9 = 2



The difference between nine and eleven is two.

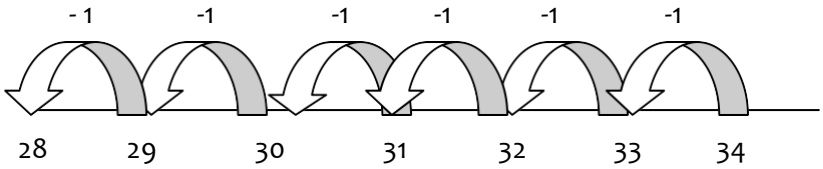
Subtraction - Year Two

- Subtract numbers using concrete objects, pictorial representations, and mentally, including:

  - A two digit number and ones
  - A two digit number and tens
  - Two two-digit numbers

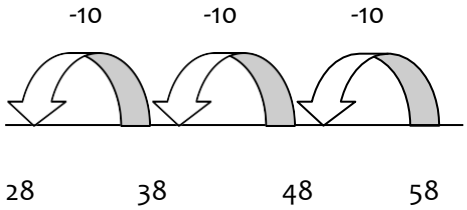
Counting back using an empty number line within 100, in ones:

34 - 6 = 28



And in tens:

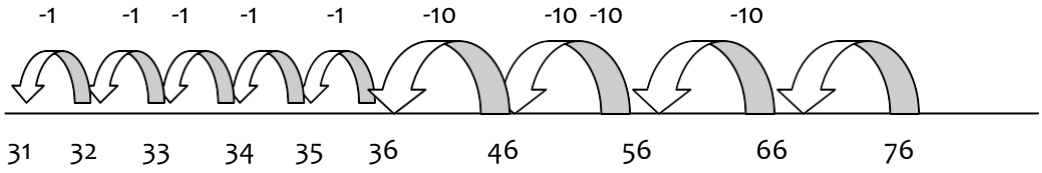
58 - 30 = 28



Use in conjunction with a 100 square to show jumps of tens.

Subtraction, using partitioning, on an empty number line:

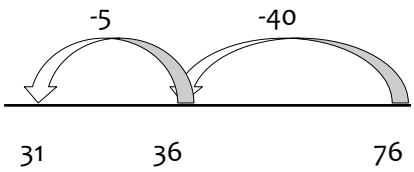
76 – 45 = 31



Use in conjunction with a 100 square to show jumps of tens and ones.

Use more efficient jumps:

76 – 45 = 31



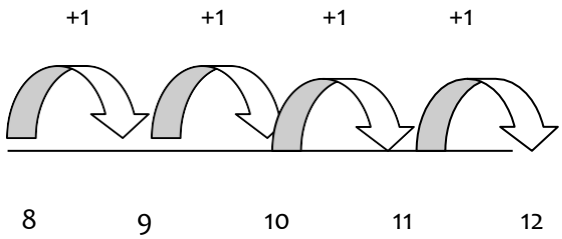
76 – 40 – 5 = 31

Use in conjunction with a 100 square to show jumps of tens and ones.

Counting on to find a small difference:

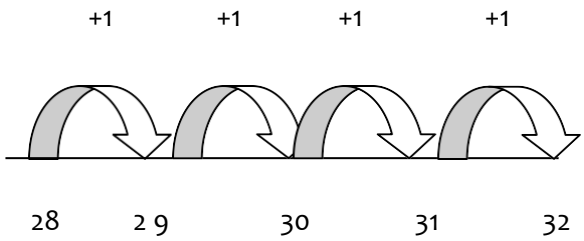
Count up from the smallest number to the largest to find the difference:

12 - 8 = 4



'The difference between 8 and 12 is 4.'

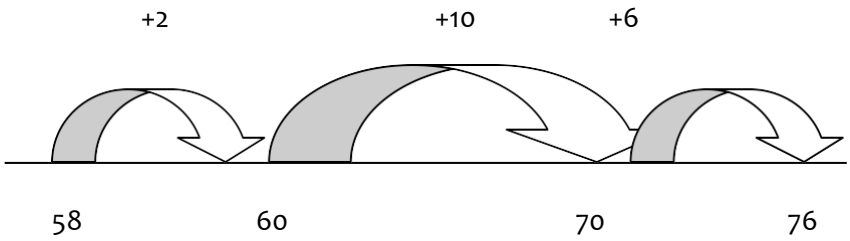
32- 28 = 4



'The difference between 28 and 32 is 4.'

Further develop this method:

76 – 58 = 18



'The difference between 58 and 76 is 18.'

Further develop subtraction with numbers that bridge 100, using a 200 grid to support.

Subtraction - Year Three

- Subtract numbers with up to three digits, using formal written method of columnar subtraction

Introduce the expanded written method with the calculation presented both horizontally and vertically (in columns). Use two-digit numbers when introducing this method, initially:

78 – 23 = 55

70 + 8
−20 + 3
50 + 5 = 55

'Partition numbers into tens and ones/units. Subtract the ones, and then subtract the tens. Recombine to give the answer.'

NB In this example decomposition (exchange) is not required.

This will lead into the formal written method:

7 8
-2 3
5 5

Use the language of place value to ensure understanding: 'Eight subtract three, seventy subtract twenty.'

Introduce the formal written method, involving decomposition/exchange:

73 – 27 = 46

6 13
7 ~~3~~
- 2 7
4 6

Use the language of place value to ensure understanding: 'We can't subtract seven from three, so we need to exchange a ten for ten ones to give us 60 + 13.'

Extend the use of the formal written method with numbers over 100, returning to the expanded method first, if necessary:

235 – 127 = 108

2 15
2 ~~3~~ ~~5~~
- 1 2 7
1 0 8

Use the language of place value to ensure understanding. In this example it has only been necessary to exchange from the tens column.

Subtraction - Year Four

- Subtract numbers with up to 4 digits using the formal written method of columnar subtraction.

Continue to practice the formal written method, involving decomposition:

```
  1  15
  2 ~~5~~ 8
-   7  3
  ---------
  1  7  5
```

Use the language of place value to ensure understanding.
In this example it has been necessary to exchange from the hundreds column.

Further develop by subtracting a three-digit number from a three-digit number:

```
  5  13
 ~~6~~ 3  7
-  2  5  2
  ---------
  3  8  5
```

Use the language of place value to ensure understanding.

Develop with four digit numbers and decimal numbers (in the context of money and measures):

3625 – 1219 = 2406

```
     1  15
  3  6 ~~2~~ ~~5~~
-  1  2  1  9
  ------------
  2  4  0  6
```

Year Five - Subtraction

- Subtract whole numbers with more than 4 digits, including using formal written method (columnar subtraction)

Continue to develop the formal written method for subtraction with three and four digit numbers:

$$\begin{array}{r} {}^{4}\cancel{5}\,{}^{9}\cancel{0}\,{}^{13}\cancel{3} \\ -\ 2\ 7\ 8 \\ \hline 2\ 2\ 5 \end{array}$$

There are no tens in the first number (503) so we have to exchange a hundred for 10 tens before we can exchange a ten for ten ones/units.

Extend with larger numbers (and decimal numbers):

12731 – 1367 = 11364

$$\begin{array}{r} {}^{\ }6\ {}^{12}\ {}^{11} \\ 1\ 2\ \cancel{7}\ \cancel{3}\ \cancel{1} \\ -\quad 1\ 3\ 6\ 7 \\ \hline 1\ 1\ 3\ 6\ 4 \end{array}$$

In this example it has been necessary to exchange from the tens and the hundreds columns.

Introduce subtraction of decimals, initially in the context of money and measures:

£166.25 – £83.72 = £82.53

$$\begin{array}{r} {}^{16}\ {}^{5}\ {}^{12} \\ 1\ 6\ 6{\cdot}2\ 5 \\ -\quad 8\ 3{\cdot}7\ 2 \\ \hline 8\ 2{\cdot}5\ 3 \end{array}$$

Ensure the decimal points line up.

Continue to practise and apply the formal written method with large numbers and decimals throughout Year 5.

Year Six - Subtraction

No objectives have been included in the programmes of study explicitly related to written methods for subtraction in Y6. However, there is an expectation that children will continue to practice and use the formal written method for larger numbers and decimals and use these methods when solving problems, when appropriate (see previous years' guidance for methods).

Our aim is that by the end of Y6 children use mental methods (with jottings) when appropriate, but for calculations that they cannot do in their heads, they use an efficient formal written method accurately and with confidence.

Stages in Multiplication

Multiplication – Early Stages (EYFS)

Children will engage in a wide variety of songs and rhymes, games and activities.

In practical activities and through discussion they will begin to solve problems involving doubling.

'Three apples for you and three apples for me. How many apples altogether?'

Multiplication – Year One

- Solve one-step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher
- Count in multiples of twos, fives and tens (to the 10th multiple)

Children will count repeated groups of the same size in practical contexts.

They will use the vocabulary associated with multiplication in practical contexts.

They will solve practical problems that involve combining groups of 2, 5 or 10.

e.g. socks, fingers and cubes.

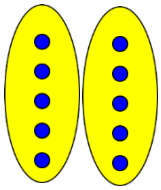
'Six pairs of socks.
How many socks altogether? 2, 4, 6, 8, 10, 12'

'Three pots of ten crayons. How many crayons altogether? 10, 20, 30'

Use arrays to support early multiplication

'Five groups of two faces. How many faces altogether? 2, 4, 6, 8, 10' Two groups of five faces. How many faces altogether? 5, 10'

'2 groups of 5'



'How many altogether?' '5 + 5 = 10'

Double five is ten

Continue to solve problems in practical contexts and develop the language of early multiplication, with appropriate resources, throughout Year 1.

Multiplication - Year Two

- Recall and use multiplication facts for the 2, 5 and 10 multiplication tables
- Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs
- solve problems involving multiplication, using materials, arrays, repeated addition, mental methods, and multiplication facts, including problems in contexts
- show that multiplication of two numbers can be done in any order (commutative)

Children will use a range of vocabulary to describe multiplication and use practical resources, pictures, diagrams and the x sign to record.

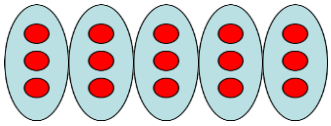
Combining Groups (repeated addition):

'3 groups of 10 crayons'

'How many crayons altogether?' '10 + 10 + 10 = 30'

'3 groups of 10' '3 times ten'

'3 x 10 = 30' '10 x 3 = 30'



'5 groups of 3' '5 lots of 3' '3 + 3 + 3 + 3 +3 = 15'

'5 times 3' '3 multiplied by 5' '5 x 3 = 15' '3 x 5 = 15'

Using arrays to support multiplication:

6 X 5 = 30

'5 + 5 + 5 + 5 + 5 + 5 = 30 '

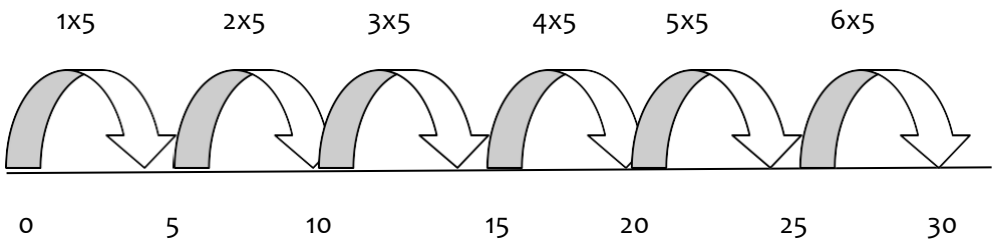
'6 rows of 5'

'6 groups of 5'

'5 groups of 6'

Using an empty number line:

6 x 5 = 30



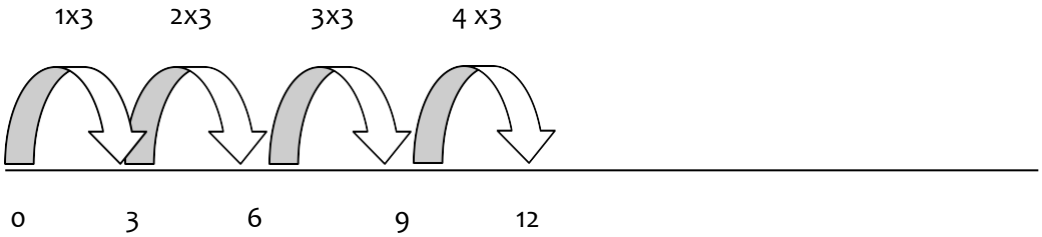
Make the link to repeated addition.

Multiplication - Year Three

- Recall and use multiplication facts for the 3, 4 and 8 multiplication tables (continue to practise the 2, 5 and 10 multiplication tables)
- Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to a formal written method

Continue to use number lines and arrays to support multiplication:

4 x 3 = 12



Partitioning method for multiplication of a teen number by a one-digit number:

13 x 5 = 65 (Partition 13 into 10 + 3)

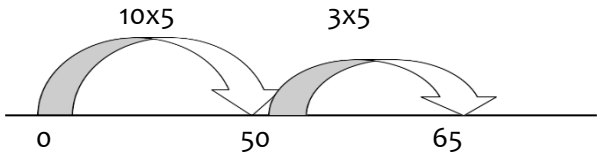
10 x 5 = 50
3 x 5 = 15

50 + 15 = 65

Demonstrate the partitioning method using a number line:

13 x 5 = 65

10 x 5 = 5 0
3 x 5 =15



Grid Method (teen number multiplied by a one- digit number):

13 x 8 = 104

x	10	3
8	80	24

80 + 24 = 104

'Partition 13 into 10 + 3 then multiply each number by 8. Add the partial products (80 and 24) together.'

This will lead into expanded short multiplication:

13 x 8 = 104

```
   10 + 3
 X      8
     2 4      (3 x 8)
+  8 0        (10 x 8)
   1 0 4
```

Include an addition symbol when adding partial products.

Refine the recording in preparation for formal short multiplication:

13 x 8 = 104

```
  1 3
X  8
  2 4   (3 x 8)
+ 8 0   (10 x 8)
  1 0 4
```

Use the language of place value to ensure understanding.
Include an addition symbol when adding partial products.

Formal short multiplication:

```
    1 3
  X   8
  1 0 4
    2
```

Ensure that the digit 'carried over' is written under the line in the correct column.
Use the language of place value to ensure understanding.

Continue to develop the formal written method of multiplication throughout year three using teen- numbers multiplied by a one-digit number.

If children are confident progress to multiplying other two-digit numbers by a one- digit number (see Y4 guidance).

Multiplication- Year Four

- Recall multiplication facts for multiplication tables up to 12 × 12
- Multiply two-digit and three-digit numbers by a one-digit number using formal written layout

Further develop the grid method for two-digit numbers multiplied by a one- digit number:

36 x 4 = 144

x	30	6
4	120	24

120 + 24 = 144 (add the partial products)

Expanded short multiplication (two-digit number by a one-digit number):

36 x 4 = 144

```
   30 + 6
X      4
     2 4        (4 x 6 = 24)
+  1 2 0        (4 x 30 = 120)
   1 4 4
```

Include an addition symbol when adding partial products.

Refine the recording in preparation for formal short multiplication:

36 x 4 = 144

```
    3 6
X   4
    2 4 (4 x 6)
+ 1 2 0        (4 x 30)
  1 4 4
```

This leads to short multiplication (formal method) of a two–digit number multiplied by a one- digit number:

36 x 4 = 144

```
  3 6
X 4
1 4 4
  2
```

Use the language of place value to ensure understanding. Ensure that the digit carried over is written under the line I the correct column.

Continue to practise the formal method of short multiplication of a two-digit number by a one - digit number throughout Y4.

Continue to develop short multiplication with three- digit numbers multiplied by a one-digit number:

```
  1 2 7
X     6
  ------
  7 6 2
  ------
  1 4
```

Use the language of place value to ensure understanding. Ensure that the digits 'carried over' are written under the line in the correct column.

Multiplication - Year Five

- 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

Introduce multiplication by a two-digit number.

Expanded long multiplication:

23 x 13 = 299

```
  2 3
X 1 3
    9   (3 x 3)
  6 0   (3 x 20)
+ 3 0   (10 x 3)
 2 0 0  (10 x 20)
 2 9 9
```

This leads into compact long multiplication (formal method):

23 x 13 = 299

```
   2 3
X  1 3
   6 9  (3 x 23)
+2 3 0  (10 x 23)
 2 9 9
```

Use thelanguage of place value to ensure understanding. Add the partial products.

Expanded long multiplication (two-digit numbers multiplied by two-digit numbers):

56 x 27 = 1512

```
     5 6
X    2 7
     4 2  (7x6)
   3 5 0  (7x50)
   1 2 0  (20x6)
+1 0 0 0  ( 20x50)
 1 5 1 2
   1
```

This leads into compact long multiplication (formal method):

56 x 27 = 1512

```
   5 6
X  2 7
  3 92  (7x56)
+ 1120  (20x56)
  1512
   1
```

Use thelanguage of place value to ensure understanding. In this example there are digits that have been 'carried' over in the partial products. Add the partial products.

Extend with three-digit numbers multiplied by a two-digit number:

124 x 26 = 3224

```
   124
X   26
   744  (6x124)
+ 2480  (20x124)
  3224
  1 1
```

Use the language of place value to ensure understanding. Add the partial products.

The prompts (in brackets) can be omitted if children no longer need them.

Extend with short and long multiplication of decimal numbers (initially in the context of money and measures) (see Y6 guidance).

Multiplication - Year Six

- Multiply multi-digit numbers (including decimals) up to 4 digits by a two- digit whole numbers

Continue to practise and develop the formal short multiplication method and formal long multiplication method with larger numbers and decimals throughout Y6.

The formal written method of long multiplication:

```
   53·2
X  24·0
  212·8      (53·2 x 4)
+ 1064·0     (53·2 x 20)
  1276·8
```

It is an option to include ·0 in this example, but not essential.

The prompts (in brackets) can be omitted if children no longer need them.

Our aim is that by the end of Y6 children use mental methods (with jottings) when appropriate, but for calculations that they cannot do in their heads, they use an efficient formal written method accurately and with confidence.

Stages in Division

Division – Early stages (EYFS)

Children will engage in a wide variety of songs and rhymes, games and activities.

In practical activities and through discussion they will begin to solve problems involving halving and sharing.

Share the apples between two people.

'Half of the apples for you and half of the apples for me.'

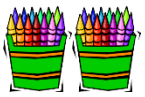
Division - Year One

- Solve one-step problems involving division by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher
- Count in multiples of twos, fives and tens (to the 10th multiple)

Children will start with practical sharing using a variety of resources. They will share objects into equal groups in a variety of situations.

They will begin to use the vocabulary associated with division in practical contexts:

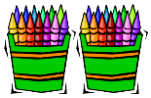
'Share these eight apples equally between two children. How many apples will each child have?'



'Share 20 crayons between 2 pots.'

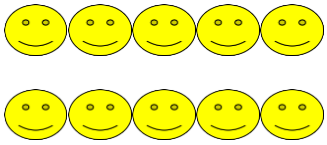
'How many crayons are in each pot?'

Children will move from sharing to grouping in a practical way:

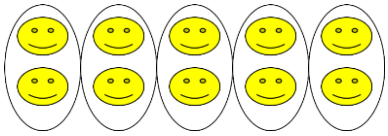


'Put 20 crayons into groups of 10. How many pots do we need?'

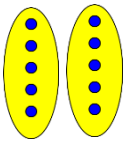
Use arrays to support early division:



'How many faces altogether? How many groups of two?'



'Five groups of two'



'How many groups of 5?'

'10 shared equally between 2 people' 'Half of ten is five'

Continue to solve problems in practical contexts throughout Y1, and develop the language of early division, with appropriate resources.

Division - Year Two

- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables
- Calculate mathematical statements for division within the multiplication tables they know and write them using the division (÷) and equals (=) signs
- Solve problems involving division, using materials, arrays, repeated subtraction, mental methods, and multiplication and division facts, including problems in contexts

Children will use a range of vocabulary to describe division and use practical resources, pictures, diagrams and the ÷sign to record, using multiples that they know.

Sharing and grouping:

'30 crayons shared equally between three pots.' (Sharing) 'We have 30 crayons and put ten crayons in each pot.'

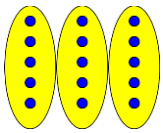
'How many pots do we need?' (Grouping)

'30 divided by 10 = 3'

'30 divided by 3= 10'

30 ÷ 10 = 3

30 ÷ 3 = 10



'How many groups of 5?'

15 ÷ 5 = 3

15 ÷ 3 = 5

'15 shared equally between 3 people is…?'

'15 divided by 3 equals 5'

'15 divided by 5 equals 3'

Using arrays to support division:

How many groups of 3? How many groups of 5?

15 shared between 3 people is…?

15 shared between 5 people is…?

15 divided by 5 = 3

15 divided by 3 = 5

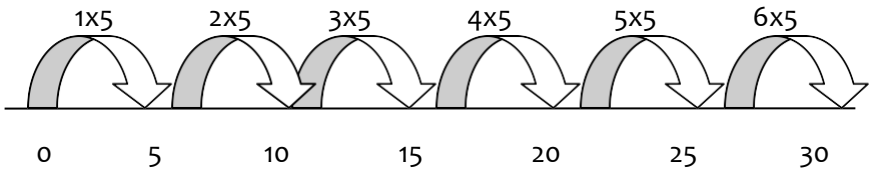
15 ÷ 5 = 3

15 ÷ 3= 5

Use an empty number line to count forwards:

30 ÷ 5 = 6

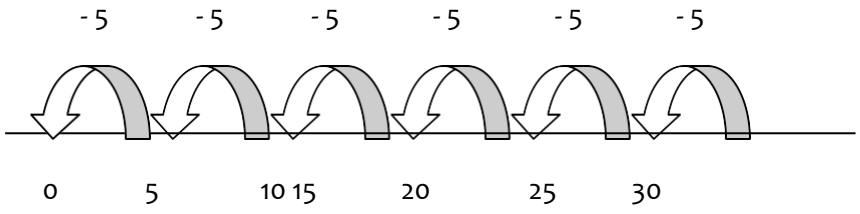
'How many jumps of five make thirty?'



Also jump back to make the link with repeated subtraction:

30 ÷ 5 = 6

'How many groups of five?'



Year Three – Division

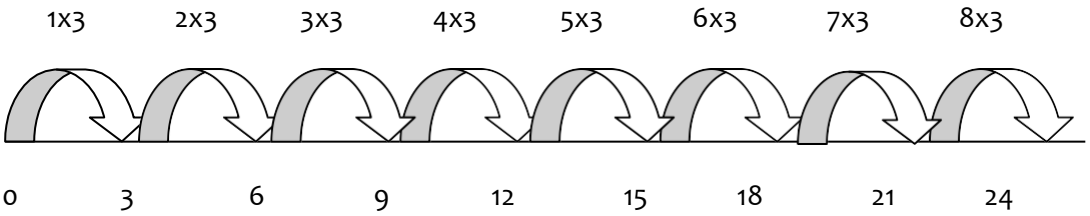
- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables (continue to practise the 2, 5 and 10 multiplication tables)
- Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers divided by one-digit numbers, using mental and progressing to a formal written method

Continue to use practical resources, pictures, diagrams, number lines, arrays and the ÷ sign to record, using multiples that they know.

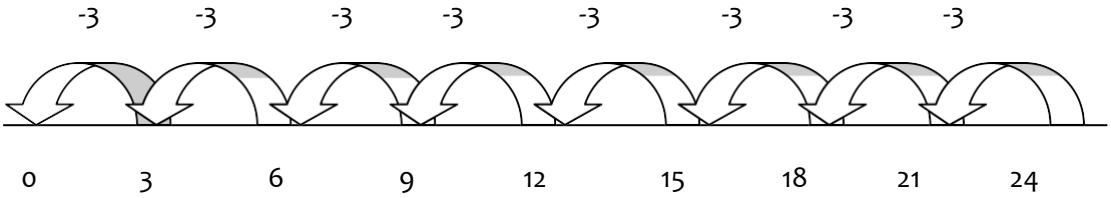
Using an empty number line to count forwards:

24 ÷ 3 = 8

'How many threes in 24?'



…also jump back from 24 to make the link with repeated subtraction:



'How many groups of three in 24?'

Introduce the formal layout using multiplication/division facts that the children know:

24 ÷ 3 = 8

$$3\overline{)\,24}\quad 8$$

'Twenty four divided by three equals eight.' 'How many threes are there in twenty four?'

Year Four- Division

- Recall multiplication and division facts for multiplication tables up to 12 × 12
- Use place value, known and derived facts to divide mentally
- Divide two-digit and three-digit numbers by a one-digit number using formal written layout (not explicitly stated in the programmes of study but implied in the non-statutory guidance)

Continue to write and calculate mathematical statements for division using the multiplication tables.

Continue using the formal written layout for division using multiplication tables:

$$4\overline{)32}\quad 8$$

'How many eights are there in thirty two?'

Continue using the formal written layout, introducing remainders:

25 ÷ 3 = 8 r1

$$3\overline{)25}\quad 8\ r1$$

NB Remainders are not specifically referred to until Y5 in the National Curriculum. However, this may be an appropriate point to introduce them using familiar multiplication facts.

Division using partitioning (two digits divided by one digit):

98 ÷ 7 = 14

$$7\overline{)70 + 28}\quad 10 + 4 = 14$$

'We have partitioned 98 into 70 and 28 (90 = 70 + 28).

Seven 'goes into' 70 ten times and seven 'goes into' 28 four times.

Ten add four equals 14'

This will lead into the formal written method of short division:

98 ÷ 7 = 14

$$7 \overline{)\,9^{2}8}\;\;14$$

Use the vocabulary of place value to ensure understanding and make the link to partitioning.

Develop further, by dividing three-digit numbers by a one- digit number using the formal method of short division with whole number answers (no remainders).

Year Five - Division

- 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

Continue to practise the formal written method of short division with whole number answers:

184 ÷ 8 = 23

$$8\overline{)\,1\,8^{2}\,4}\qquad 23$$

Use the language of place value to ensure understanding.

And with remainders:

432 ÷ 5 = 86 r2

$$5\overline{)\,4\,3^{3}\,2}\qquad 86\ r2$$

The remainder can also be expressed as a fraction $\frac{2}{5}$ (the remainder divided by the divisor): 432 ÷ 5 = $86\frac{2}{5}$

Continue to practise, develop and extend the formal method of short division, with and without remainders. Interpret and express remainders according to the context.

Year Six – Division

- Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to 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

Continue to practise the formal method of short division, with and without remainders, using the language of place value to ensure understanding:

3624 ÷ 12 = 0302

```
      0302
   ┌──────
12 ) 3³62²4
```

Children will need to select the most effective method for each calculation/problem they meet, including whether to use the standard, formal written method of long division:

280 ÷ 5 = 56

```
      056
   ┌──────
5  ) 280
     - 0
       28
     - 25
       30
     - 30
       0
```

Remainder is expressed as a decimal.

Our aim is that by the end of Y6 children use mental methods (with jottings) when appropriate, but for calculations that they cannot do in their heads, they use an efficient formal written method accurately and with confidence.