Chellaston Junior School

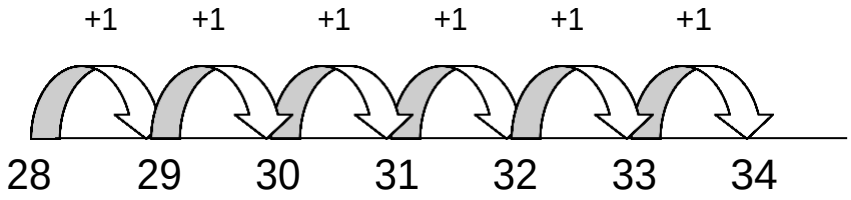
Numeracy
Written Calculation Policy

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

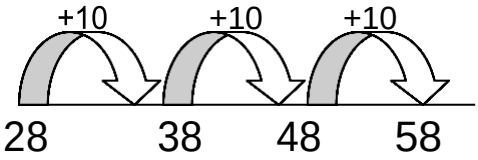
Counting on in ones using an empty number line, within 100…

28 + 6 = 34



…and in tens

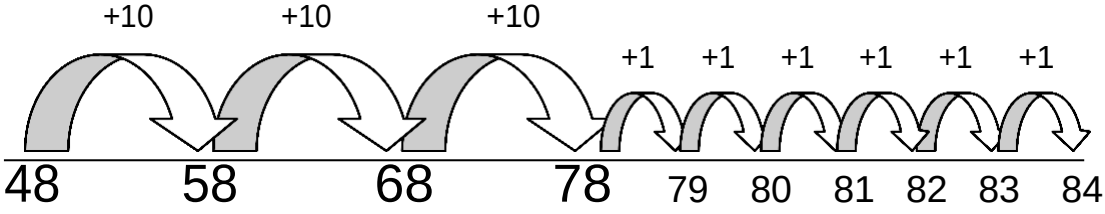
28 + 30 = 58



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

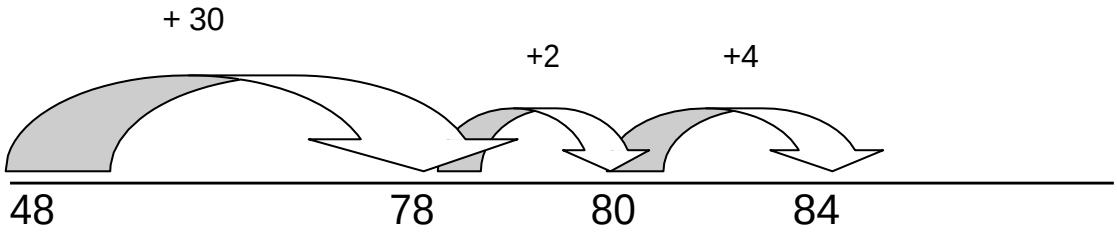
48 + 36 = 84

'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:

43 + 25 = 68

40 3 20 5

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.

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

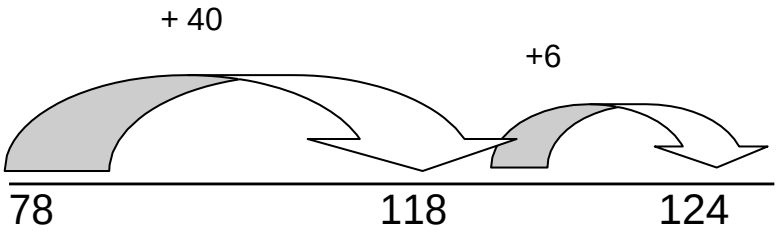
Addition - Year Three

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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Further develop the use of the empty number line with calculations that bridge 100:

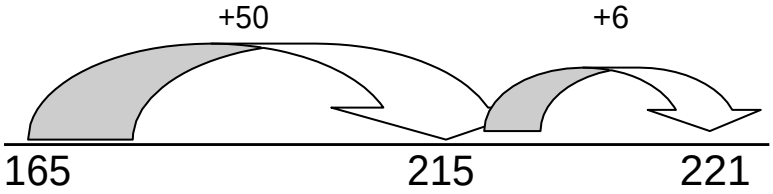
78 + 46 = 124



Use a 200 grid to support counting on in tens and bridging 100…

… and with addition of a three-digit and a two -digit number:

165 + 56 = 221



Further develop the partitioning method with calculations that bridge 100:

85 + 37 = 80 + 5 + 30 + 7

80 + 30 = 110
5 + 7 = 12
110 + 12 = 122

85 + 37 = 122

The partitioning method can also be used with three-digit numbers.

Introduce the expanded written method with the calculation presented both horizontally and vertically (in columns) in the Spring Term (2).

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

63 + 32 = 95

$$\begin{array}{r} 60 + 3 \\ + \quad \underline{30 + 2} \\ 90 + 5 = 95 \end{array}$$

'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…

$$\begin{array}{rrl} & 6\ 3 & \\ + & \underline{3\ 2} & \\ & 5 & (3 + 2) \\ + & \underline{9\ 0} & (60 + 30) \\ & 9\ 5 & \end{array}$$

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

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

68 + 24 = 92

$$\begin{array}{r} 60 + 8 \\ + \quad \underline{20 + 4} \\ 80 + 12 = 92 \end{array}$$

'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…

$$\begin{array}{rrl} & 6\ 8 & \\ + & \underline{2\ 4} & \\ & 1\ 2 & (8 + 4) \\ + & \underline{8\ 0} & (60 + 20) \\ & 9\ 2 & \end{array}$$

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

Addition - Year Four

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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Continue to teach the use of empty number lines with three and four digit numbers, as appropriate.

Further develop the expanded method 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… (Summer Term)

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 120. 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.

If children are confident, introduce the addition of a four-digit number and a three digit number:

1845 + 526 = 2371

$$\begin{array}{r} 1\,8\,4\,5 \\ +\quad 5\,2\,6 \\ \hline 2\,3\,7\,1 \\ \scriptstyle 1\quad\;\; 1 \end{array}$$

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

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

Addition - Year Five

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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Continue to teach the use of empty number lines with larger numbers (and decimals), as appropriate.

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

$$\begin{array}{r} 21848 \\ +\ 1523 \\ \hline 23371 \\ {\scriptstyle 1\ \ 1} \end{array}$$

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

$$\begin{array}{r} 154{\cdot}75 \\ +\ 233{\cdot}82 \\ \hline \end{array} \qquad \begin{array}{r} \\ \\ \hline 388{\cdot}57 \\ {\scriptstyle 1} \end{array}$$

Ensure that the decimal points line up on a line not in a square of its own..

Continue to use the language of place value to ensure understanding

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

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

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.

Subtraction - Year Two

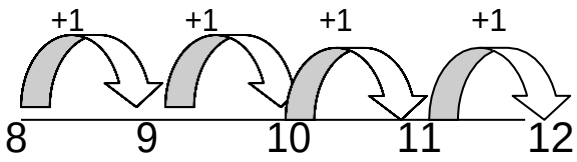
- Subtract numbers using concrete objects, pictorial representations, and mentally, including:
    - A two digit number and ones
    - A two digit number and tens
    - Two two-digit numbers

Counting 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”.

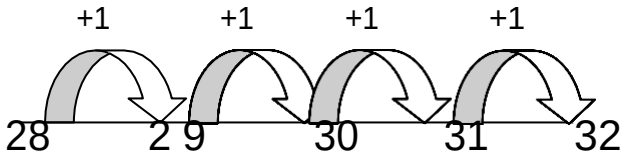
Count up from the smallest number to the largest to find the difference.

12 - 8 = 4



‘The difference between 8 and 12 is 4.’

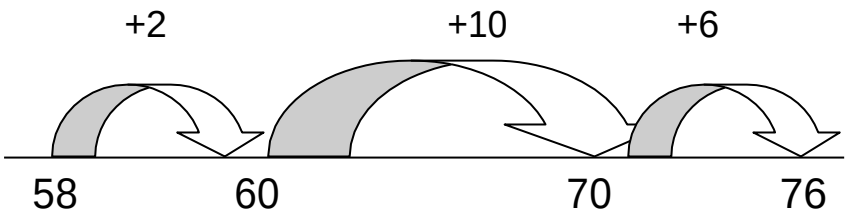
32- 28 = 4



‘The difference between 28 and 32 is 4.’

Further develop the use of an empty number line using up to 3 digits:

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.

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

Subtraction - Year Three

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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

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 and 8
−20 and 3
50 and 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.

You might replace the + sign with the word 'and' to avoid confusion.

This will lead into the formal written method: (Spring Term)

 7 8
-2 3
 5 5

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

NB A number line would be an appropriate method for this calculation but use two-digit numbers to illustrate the formal written method initially.

Subtraction - Year Four

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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Continue to teach the use of empty number lines with three and four digit numbers, as appropriate.

Introduce the expanded written method where exchange/decomposition is required:

73 − 27 = 46

70 and 3	becomes	60 and13	73 is partitioned into 60+13 in order to calculate 73-27
- 20 and 7		- 20 and 7	
		40 and 6 = 46	

NB children will need to practise partitioning numbers in this way. Base- ten materials could be used to support this.

When children are confident with the expanded method 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.'

Use base ten materials to support understanding.

If children are confident, 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.

Use base ten materials to support understanding.

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

Continue to develop the formal written method of subtraction by revisiting the expanded method first, if necessary. Continue to use base -ten materials to support understanding.

258 - 73 = 185

200 and 50 and 8 - 70 and 3 becomes 100 and 150 and 8 - 70 and 3

100 and 80 and 5 = 185

You might replace the + sign with the word 'and' to avoid confusion.
Children will need to practise partitioning in a variety of ways.

This leads to the formal written method, involving decomposition… (Summer Term)

$$\begin{array}{r} {\scriptstyle 1\ \ 15} \\ 2\ \cancel{5}\ \cancel{8} \\ -\ \ 7\ 3 \\ \hline 1\ 7\ 5 \end{array}$$

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:

637 – 252 = 385

Ensure that children are confident in partitioning numbers in this way.

600 and 30 and 7 - 200 and 50 and 2

500 and 130 and 7 - 200 and 50 and 2

300 and 80 and 5 = 385

This leads to a formal written method:

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

Use the language of place value to ensure understanding and use base-ten materials, if necessary.

When children are confident, 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
```

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

Year Five - Subtraction

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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Continue to teach the use of empty number lines with larger numbers and decimals, as appropriate.

Continue to develop the formal written method for subtraction with three and four digit numbers (see Y4 guidance), returning to an expanded method and using base ten materials, if necessary.

503 – 278 = 225

In this example 503 has to be partitioned into 400+90+13 in order to carry out the subtraction calculation.

500 and 00 and 3
- 200 and 70 and 8

400 and 90 and 13
- 200 and 70 and 8
200 and 20 and 5

This leads into the formal written method (there is potential for error in this example):

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

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

NB It would be appropriate to discuss the use of mental calculation methods with an example like this one, i.e. would an empty number line be a more efficient method for these numbers?

When children are confident extend with larger numbers (and decimal numbers). Return to an expanded method, if necessary.

12731 – 1367 = 11364

```
      6  12 11
   1 2 ~~7~~ ~~3~~ ~~1~~
 -   1 3 6 7
   1 1 3 6 4
```

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

NB If children are making significant errors, provide calculations where only one exchange is required.

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

£166.25 – £83.72 = £82.53

```
    16  5   12
~~1~~ ~~6~~ ~~6~~· ~~2~~ 5
- 8 3· 7 2
  8 2· 5 3
```

Ensure the decimal points line up.

Continue to practise and apply the formal written method with large numbers and decimals throughout year five.

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

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).

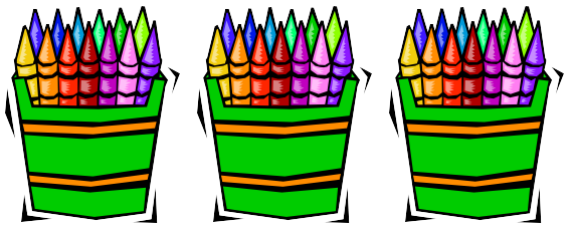
Our aim is that by the end of Y6 children use mental methods (with jottings) when appropriate, but for calculations that they cannot do in their heads, they use an efficient formal written method accurately and with confidence.

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):

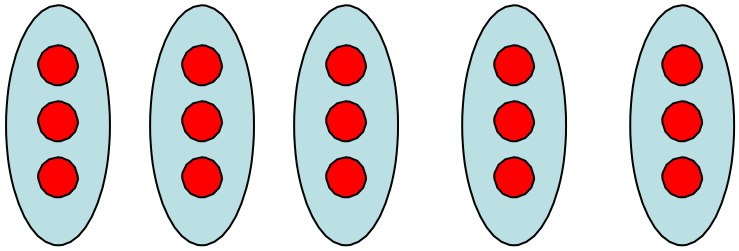


'3 groups of 10 crayons'

'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’

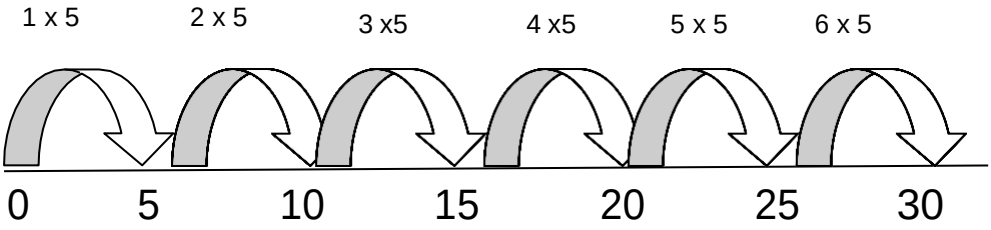
‘5 groups of 6’

‘5 x 6 = 30’

‘6 x 5 = 30’

Using an empty number line:

6 x 5 = 30



Make the link to repeated addition.

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

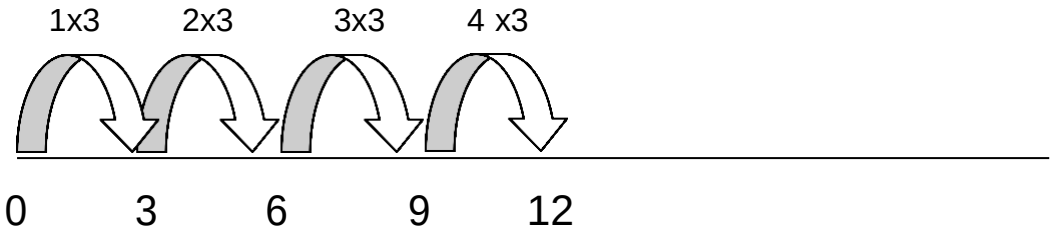
Multiplication - Year Three

- 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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Continue to use number lines and arrays to support multiplication, as appropriate (see Y2 guidance).

4 x 3 = 12



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

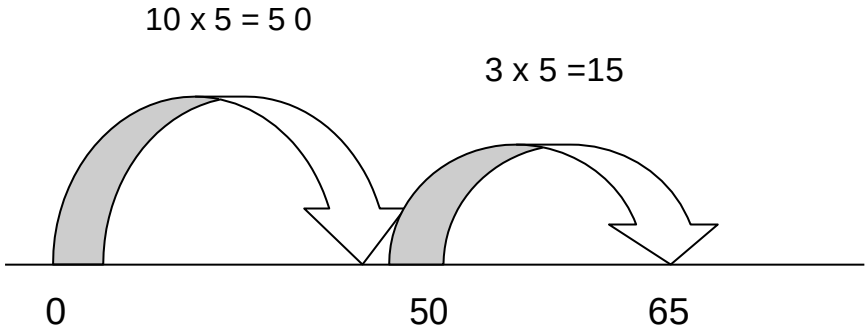
13 x 5 = 65 (Partition 13 into 10 + 3)

10 x 5 = 50
3 x 5 = 15

50 + 15 = 65

Demonstrate the partitioning method using a number line:

13 x 5 = 65



Expanded short multiplication:

13 x 8 = 104

10 and 3

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

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.

Model the same calculation using a number line, if necessary, to ensure understanding.

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).

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Continue to use empty number lines, as appropriate (see Y3 guidance).

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

36 x 4 = 144

30 and 6
X 4
24 (4 x 6 = 24)
+ 120 (4 x 30 = 120)
144

Include an addition symbol when adding partial products.

Refine the recording in preparation for formal short multiplication:

36 x 4 = 144

36
x 4
+ 24 (4 x 6)
120 (4 x 30)
144

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 in the correct column.

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

If children are confident, continue to develop short multiplication with three- digit numbers multiplied by a one-digit number.

This leads to expanded short multiplication:

127 x 6 = 762

```
  1 2 7
- x   6
-------
    4 2   (6x7)
+ 1 2 0   (6x20)
- 6 0 0   (6x100)
- 7 6 2
```

This will lead into short multiplication (formal method):

```
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.

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Build on the work covered in Y4 with the formal method of short multiplication (two-digit number multiplied by a one-digit number).

When children are confident introduce multiplication by a two-digit number. If necessary, return to the grid method and/or expanded method first.

Expanded long multiplication (two-digit numbers multiplied by a teen- number) (more able children):

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 the language 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 expanded method is linked to the grid method

This leads into…

Compact long multiplication (formal method):

56 x 27 = 1512

```
    5 6
  x 2 7
  3 9 4 2   (7x56)
+ 1 1 1 2 0 (20x56)
  1 5 1 2
    1
```

Use the language 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.

When children are confident with long multiplication extend with three-digit numbers multiplied by a two-digit number, returning to the grid method first, if necessary:

124 x 26 = 3224

```
    1 2 4
  X   2 6
  7 1 4 2 4   (6x124)
+ 2 4 8 0     (20x124)
  3 2 2 4
  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), returning to an expanded method first, if necessary (see Y6 guidance).

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

Multiplication - Year Six

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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Continue to practise and develop the formal short multiplication method and formal long multiplication method with larger numbers and decimals throughout Y6. Return to an expanded forms of calculation initially, if necessary (see Y5 guidance).

The formal written method of long multiplication:

```
   5 3·2
x  2 4·0
  2 1 2 ·8   (53·2 x 4)
1 0 6 4 ·0   (53·2 x 20)
1 2 7 6 ·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.

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

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.

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

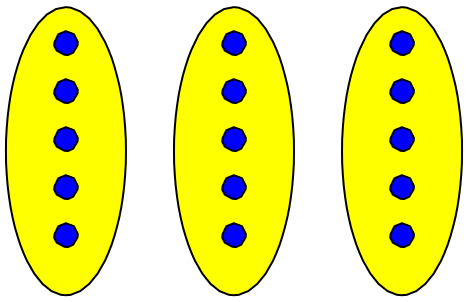
Children will use a range of vocabulary to describe division and use practical resources, pictures, diagrams and the ÷sign to record, using multiples that they know.

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 shared equally between 3 people is…?'

'15 divided by 3 equals 5'
'15 divided by 5 equals 3'

15 ÷ 5 = 3
15 ÷ 3 = 5

Using arrays to support division

15 ÷ 5 = 3
15 ÷ 3= 5

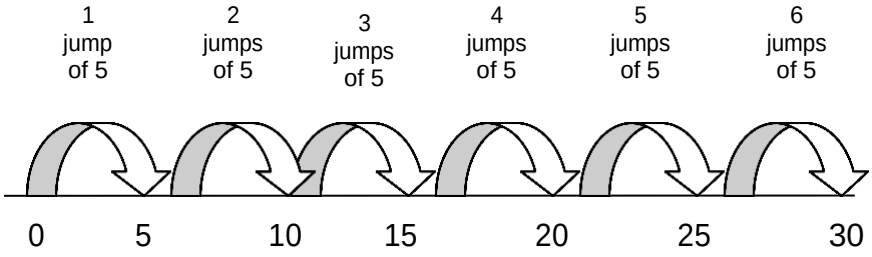
How many groups of 3?
How many groups of 5?
15 shared between 3 people is…?
15 shared between 5 people is…?

15 divided by 5 = 3
15 divided by 3 = 5

When children are ready, use an empty number line to count forwards:

30 ÷ 5 = 6

'How many jumps of five make thirty?'



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

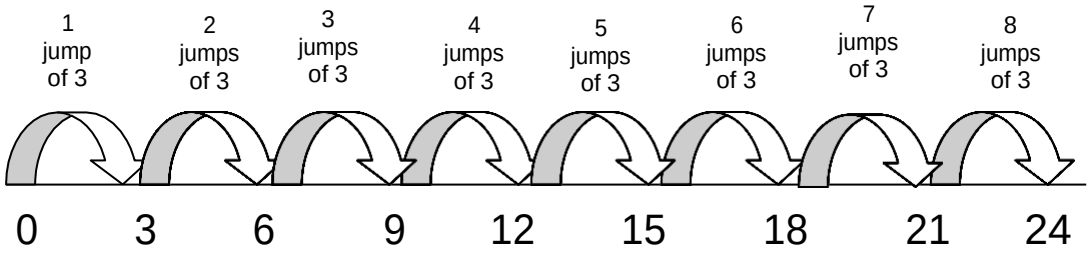
NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Continue to use practical resources, pictures, diagrams, number lines, arrays and the ÷ sign to record, using multiples that they know, as appropriate (see Y2 guidance).

Using an empty number line to count forwards…

24 ÷ 3 = 8

'How many threes in 24?'



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

$24 \div 3 = 8$

This can also be recorded as…

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

‘Twenty four divided by three equals eight.’

‘How many threes are there in twenty four?’

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

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)

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Continue to write and calculate mathematical statements for division using the multiplication tables that the children know e.g.

$32 \div 8 = 4$

Continue using the formal written layout for division using multiplication tables that they know:

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

'How many eights are there in thirty two?'

Continue using the formal written layout, introducing remainders:

$25 \div 3 = 8$ r1

$$3 \overline{)\,25}\,8\text{ r }1$$

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.

$98 \div 7 = 14$

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

$$7 \overline{)\ 70 \text{ and } 28} = 10 \text{ and } 4 = 14$$

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:

$98 \div 7 = 14$

$$7 \overline{)\ 9^{2}8} = 1\ 4$$

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

Continue to practise the formal method of short division throughout Y4.

If children are confident 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).

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

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

184 ÷ 8 = 23

$$8\overline{)1\,8^{2}4}\quad 2\,3$$

Use the language of place value to ensure understanding.

Make the link to the partitioning method (see Y4 guidance).

…and with remainders:

432 ÷ 5 = 86 r2

$$5\overline{)\,4\,3^{3}2}\quad 8\,6\,r\,2$$

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

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

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

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

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on

Continue to practise the formal method of short division, with and without remainders, using the language of place value to ensure understanding (see Y5 guidance).

496 ÷ 11 = 45 r1

$$\begin{array}{r} 45\ r\ 1 \\ 11\overline{)\,49^{5}6} \end{array}$$

The remainder can also be expressed as a fraction, $\frac{1}{11}$ (the remainder divided by the divisor)

Dividing by a two-digit number using a formal method of long division:

$$\begin{array}{r} 45\ r\ 1 \\ 11\overline{)\,496} \\ -\,440 \quad (40 \times 11) \\ \hline 56 \\ -\,55 \quad (5 \times 11) \\ \hline 1 \quad \text{(remainder)} \end{array}$$

Multiples of the divisor (11) have been subtracted from the dividend (496)

'40 (lots of 11) + 5 (lots of 11) = 45 (lots of 11)'

'1 is the remainder'

Answer: $45\frac{1}{11}$

Standard short division does not help with the following calculation. However, it can be solved using long division (by repeated subtraction using multiples of the divisor):

144÷ 16 = 9

```
        9
    ________
16 ) 144
     -64      (4 x 16)
      80
     -64      (4 x 16)
      16
     -16      (1 x 16)
       0
```

Multiples of the divisor (16) have been subtracted from the dividend (144)

'4 (lots of 16) + 4 (lots of 16) + 1 (lot of 16) = 9 (lots of 16)

There is no remainder'

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:

432 ÷ 15 = 28 r12

```
      28  r12
    ________
15 ) 432
     300      (20 x 15)
     132
     120      (8 x 15)
      12      (remainder)
```

Multiples of the divisor (15) have been subtracted from the dividend (432)

'20 (lots of 15) + 8 (lots of 15) = 28

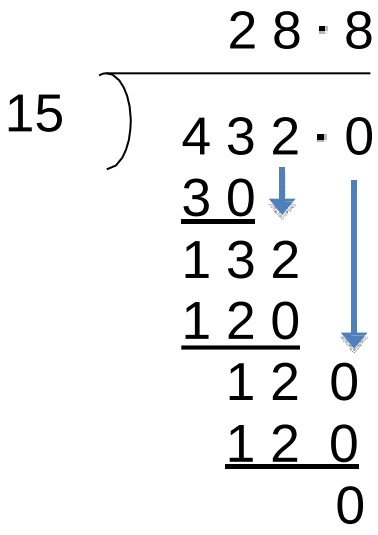
12 is the remainder'

The remainder can also be expressed as a fraction, $\frac{12}{15}$ (the remainder divided by the divisor) or as a decimal, 0.8 (see next example)

The answer is: $28\frac{12}{15}$ or 28·8

This is an alternative way of recording formal long division:

$432 \div 15 = 28{\cdot}8$



NB Only teach this method when children are completely secure with the previous method.

The remainder is expressed as a decimal.

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

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.

NOTES