# Which method will my child be using?

## Addition

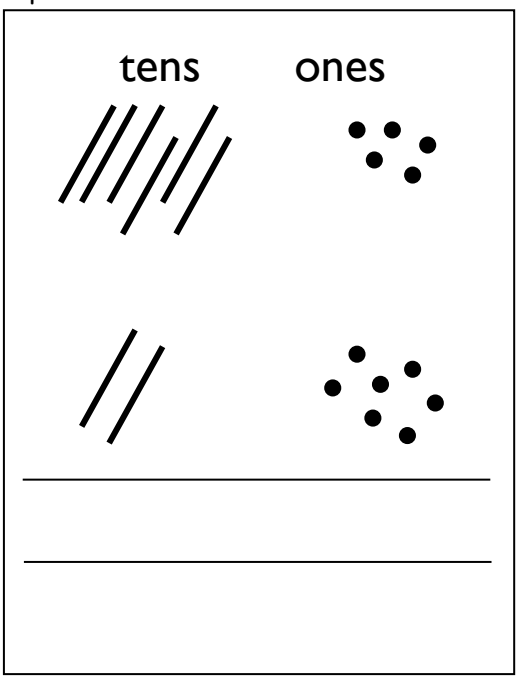
### Year 3

Children will continue to build on their knowledge of using Base 10 equipment and place value counters from Y2 and continue to use the idea of exchange.

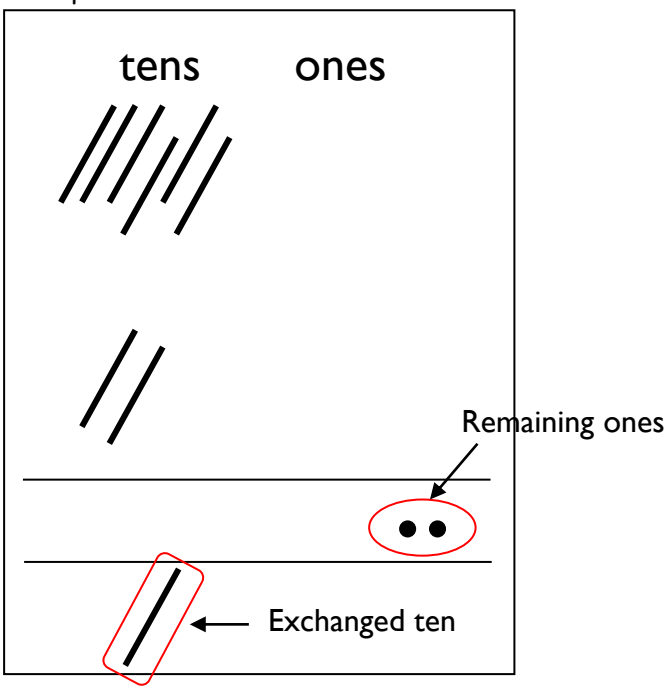
Children will add the **least significant digits** first (i.e. start with the ones), and in an identical method to that from year 2, should identify whether there are greater than ten ones which can be exchanged for one ten.

Children will use a place value grid to begin to set the calculation out vertically and to support their knowledge of exchange between columns (as in Step 1 in the diagram below).e.g. 65 + 27

Step 1




Step 2




Step 1

| | T | O |
|---|---|---|
| | 6 | 5 |
| + | 2 | 7 |
| | | |

Step 2

| | T | O |
|---|---|---|
| | 6 | 5 |
| + | 2 | 7 |
| | | 2 |
| | 1 | |

Step 3

| | T | O |
|---|---|---|
| | 6 | 5 |
| + | 2 | 7 |
| | 9 | 2 |
| | 1 | |

Children will use this practical method to link their understanding of exchange to how the column method is set out. They will utilise the written and practical methods alongside each other and finally, and when they are ready, use just the written method. By the end of year 3, children will also be applying this method to 3 digit numbers.

# Which method will my child be using?

## Subtraction

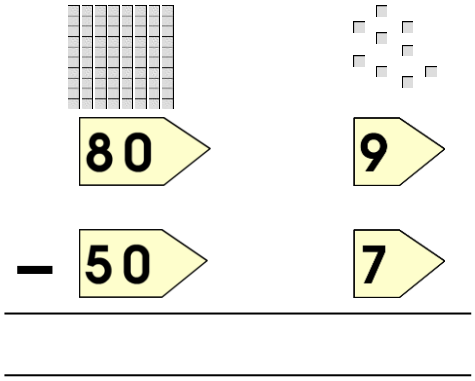
### Year 3

Children will build on their knowledge of using **Base 10 equipment** from Year 2 and continue to use this alongside **place value counters** to help with the transition to a formal written method of columnar subtraction for subtracting numbers up to three digits. The **Base 10 equipment/place value counters** should be practically used and the **formal written methods of columnar subtraction** be recorded by the children. Children will begin to explore the **formal written methods of columnar subtraction** with two –digit calculations. Progression of formal written methods of columnar subtraction in Year 3-

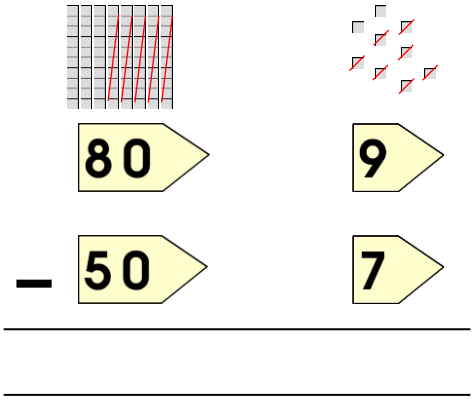
- Subtract 2 numbers with two digits together without exchange between the ones and tens.
- Subtract 2 numbers with two digits together with exchange.
- Subtract 2 numbers with three digits together without exchange between the ones and tens.
- Subtract 2 numbers with three digits together with exchange.

Children will build on their knowledge of using Base 10 equipment from Y2 and continue to use the idea of exchange. This process could be demonstrated using arrow cards to show the partitioning and Base 10 materials to represent the first number, removing the ones and tens as appropriate (as with the more informal method in Y2).

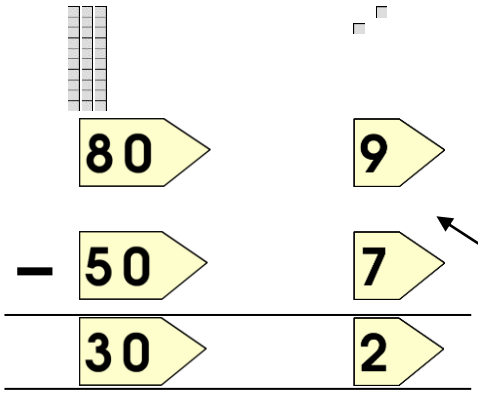
Step 1




Step 2




Step 3




*Emphasise that the second (bottom) number is being subtracted from the first (top) number rather than the lesser number from the greater. The calculation should be read 9 subtract 7.*

This will be recorded by the children as:

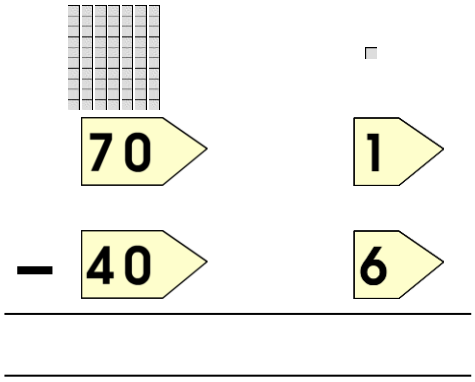
| | | | | |
|---|---|---|---|---|
| | 80 | → | 9 | |
| - | 50 | → | 7 | |
| | 30 | → | 2 | = 32 |

Children can also use jottings of the Base 10 materials (as in Year 2) to support with their calculation, as in the example below.

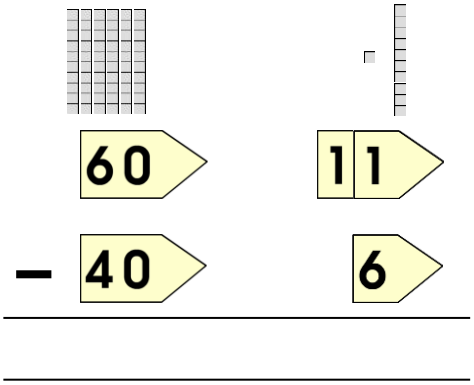
$$\begin{array}{rcl} 80 & \rightarrow & 9 \\ -\ 50 & \rightarrow & 7 \\ \hline 30 & \rightarrow & 2 \end{array} = 32$$

From this the children will begin to solve problems which involve exchange. Children need to consider whether there are enough ones/ones to remove 6. In this case there are not (Step 1) so they need to exchange a ten into ten ones to make sure that there are enough. They should be able to see that the number is just partitioned in a different way, but the amount remains the same (71 = 70 + 1 = 60 + 11).

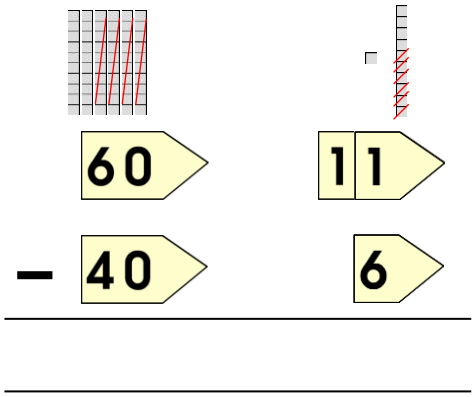
Step 1



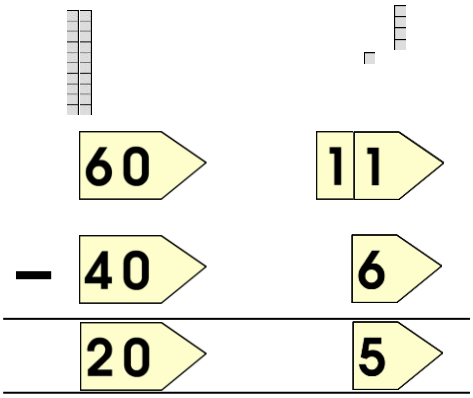

Step 2




Step 3




Step 4




This will be recorded by the children as:

$$\begin{array}{rcl} 60 & & \\ \cancel{70} & \rightarrow & {}^{1}1 \\ -\ 40 & \rightarrow & 6 \\ \hline 20 & \rightarrow & 5 \end{array} = 25$$

By the end of Year 3, children should also extend this method for three digit numbers.

# Which method will my child be using?

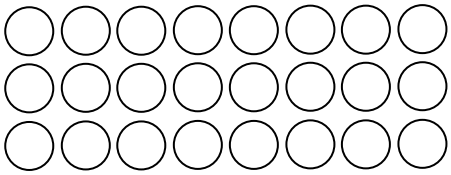
## Multiplication

### Year 3

To progress in Y3, children will initially continue to use arrays where appropriate linked to the multiplication tables that they know (2, 3, 4, 5, 8 and 10), e.g.

3 x 8

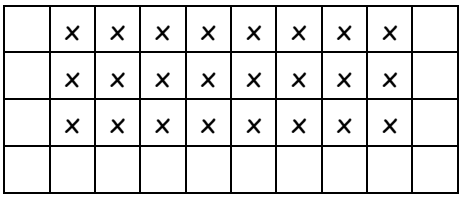
They may show this using practical equipment:



3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 3 x 8 = 24

8 + 8 + 8 = 8 x 3 = 24

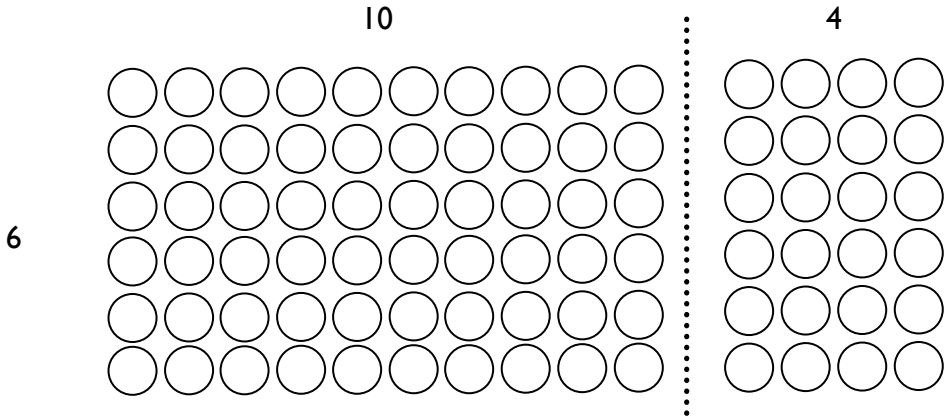
or by jottings using squared paper:



3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 3 x 8 = 24

8 + 8 + 8 = 8 x 3 = 24

As they progress to multiplying a two-digit number by a single digit number, children should use their knowledge of partitioning two digit numbers into tens and units/ones to help them. For example, when calculating 14 x 6, children should set out the array, then partition the array so that one array has ten columns and the other four.

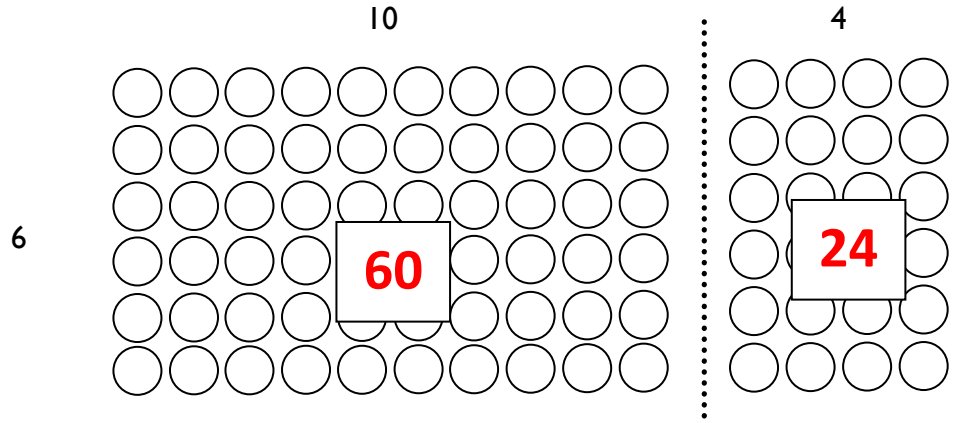



Partitioning in this way, allows children to identify that the first array shows 10 x 6 and the second array shows 4 x 6. These can then be added to calculate the answer:

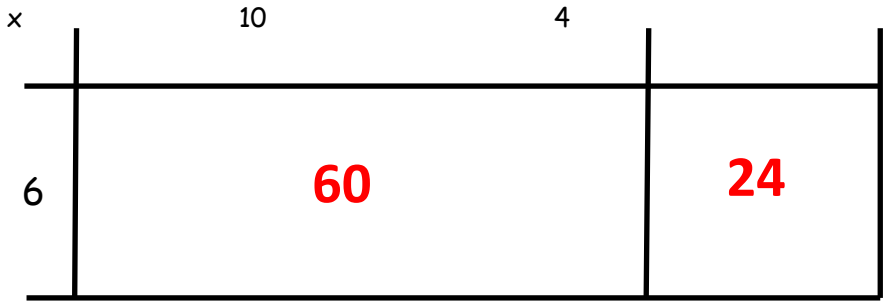
(10 x 6) + (4 x 6)
= 60 + 24
= 84

NB There is no requirement for children to record in this way, but it could be used as a jotting to support development if needed.

This method is the precursor step to the grid method. Using a two-digit by single digit array, they can partition as above, identifying the number of rows and the number of columns each side of the partition line.




By placing a box around the array, as in the example below, and by removing the array, the grid method can be seen.




It is really important that children are confident with representing multiplication statements as arrays and understand the rows and columns structure before they develop the written method of recording.
From this, children can use the grid method to calculate two-digit by one-digit multiplication calculations, initially with two digit numbers less than 20. Children should be encouraged to set out their addition in a column at the side to ensure the place value is maintained.

13 x 8

| x | 10 | 3 |
|---|---|---|
| 8 | 80 | 24 |

80
+ 24
104

When children are ready, they can then progress to using this method with other two-digit numbers.

37 x 6

| x | 30 | 7 |
|---|---|---|
| 6 | 180 | 42 |

180
+ 42
222

Children should also be using this method to solve problems and multiply numbers in the context of money or measures.

**Once children are confident in the use of grid method, they will be introduced to standard columnar methods for 2 digit x 1 digit using place value counters to support their understanding.**

# Which method will my child be using?

## Division

### Year 3

In preparation for developing the 'chunking' method of division, children should first use the repeated subtraction on a vertical number line alongside the continued use of practical equipment. There are two stages to this:

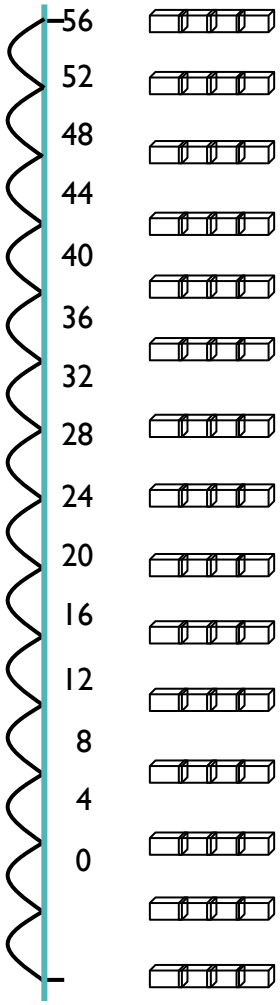
**Stage 1** – repeatedly subtracting individual groups of the divisor

**Stage 2** – subtracting multiples of the *divisor* (initially 10 groups and individual groups, then 10 groups and other multiples in line with table's knowledge)

After each group has been subtracted, children should consider how many are left to enable them to identify the amount remaining on the number line.

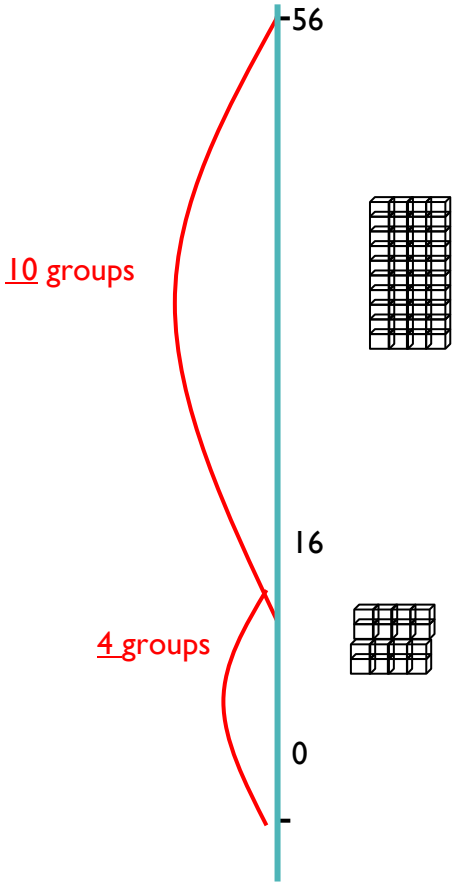
**Stage 1**

56 ÷ 4 = 14 (groups of 4)




**Stage 2**

56 ÷ 4 = 10 (groups of 4) + 4 (groups of 4)
= 14 (groups of 4)




Partial tables/key facts box should be used every to support children in recall of multiplication facts to support efficient mental and written calculations in division. It will help them to identify the largest group they can subtract in one chunk.

| | |
|---|---|
| 1x | 3 |
| 2x | 6 |
| 4x | 12 |
| 5x | 15 |
| 10x | 30 |
| 20x | 60 |

Groups of 3
Partial tables/key facts box

| | |
|---|---|
| 1x | 4 |
| 2x | 8 |
| 4x | 16 |
| 5x | 20 |
| 10x | 40 |
| 20x | 80 |

Groups of 4
Partial tables/key facts box

| | |
|---|---|
| 1x | 8 |
| 2x | 16 |
| 4x | 32 |
| 5x | 40 |
| 10x | 80 |
| 20x | 160 |

Groups of 8
Partial tables/key facts box

**Remainders**

Initially, children will continue to use division by grouping (including those with remainders), where appropriate linked to the multiplication tables that they know (2, 3, 4, 5, 8 and 10), e.g. 43 ÷ 8 = 5 remainder 3.

Children should be able to solve real life problems including those with money and measures. They need to be able to make decisions about what to do with remainders after division and round up or down accordingly.

**Standard Method for short division**

When children are secure in the use of partial tables for division, they will be introduced to more standard methods with the use of place value counters to support their understanding.

When children are secure with the use of place value counters for modelling divison, and can understand the link with the formal short division method, examples should be provided where whole number remainders will occur.


E.g. 87 ÷ 3

The eight 'ten' counters have been 'shared' between the 4 rows, with each row receiving two 'ten' counters, or 20.

The seven '1' counters are then shared between the four rows. Each row receives one '1' counter, and there are 3 remaining.

The formal written layout should be carried out alongside.

```
    2  1  r.3
  ------
4 | 8  7
```