Which method will my child be using?

Addition

Year 6

Children will extend the carrying method and use it to add whole numbers and decimals with any number of digits.

```
    4 2
  6 4 3 2
    7 8 6
        3
+   4 6 8 1
-------------
  1 1 9 4 4
-------------
    1 1 2 1
```

```
    4 0 1 . 2 0
      2 6 . 8 5
+       0 . 7 1
-----------------
    4 2 8 . 7 6
-----------------
        1
```

When adding decimals with different numbers of decimal places, children should be taught and encouraged to make them the same through identification that 2 tenths is the same as 20 hundredths, therefore, 0.2 is the same value as 0.20.

They will also be adding:

- several numbers with different numbers of digits, understanding the place value;
- *decimals with up to two decimal places (with mixed numbers of decimal places), knowing that the decimal points line up under one another.*
- amounts of money and measures, including those where they have to initially convert from one unit to another.

Subtraction

Year 6

Children should extend the decomposition method and use it to subtract whole numbers and decimals with any number of digits.

```
      5 13
    ~~6~~ ~~4~~ 13 2
-     4 6 8 1
-------------------
      1 7 5 1
-------------------
```

```
      3     6    11
    ~~4~~ 1 ~~7~~ . ~~2~~ 10
-       3 4 . 7 1
---------------------
    3 8 2 . 4 9
---------------------
```

When subtracting decimals with different numbers of decimal places, children should be taught and encouraged to make them the same through identification that 2 tenths is the same as 20 hundredths, therefore, 0.2 is the same value as 0.20.

They will also be subtracting:

- numbers with different numbers of digits, understanding the place value;
- decimals with up to two decimal places (with mixed numbers of decimal places), knowing that the decimal points line up under one another.
- amounts of money and measures, including those where they have to initially convert from one unit to another.

Practical resources such as base ten and place value counters should be available for children who require them to aid understanding.

Multiplication

Year 6

By the end of Y6, children should be able to use a method to multiply any number by a two-digit number. They should also develop a method to be able to multiply decimal numbers with up to two decimal places, e.g.

4.92 x 3

x	4	0.9	0.02
3	12	2.7	0.06

$$\begin{array}{r} 12 \\ +\ 2.7 \\ +\ 0.06 \\ \hline 14.76 \end{array}$$

Once confident with grid method of multiplication for multiplying decimals, children can progress to expanded columnar methods.

eg. 3.76 x 4

$$\begin{array}{rl} & 3.7\ 6 \\ \times & \quad 4 \\ \hline & 0.2\ 4 \quad (4 \times 0.06) \\ & 2.8\ 0 \quad (4 \times 0.7) \\ & 12.0\ 0 \quad (4 \times 3) \\ & 15.0\ 4 \end{array}$$

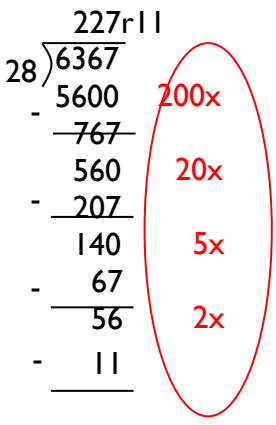
Only when children are confident and accurate using these methods should they be shown the standard formal methods for short multiplication and long multiplication.

Children should also be using these methods to solve problems and multiply numbers, including those with decimals, in the context of money or measures, e.g. to calculate the cost of 7 items at £8.63 each, or the total length of six pieces of ribbon of 2.28m each.

Division

Year 6

To develop the chunking method further, it should be extended to include dividing a four-digit number by a two-digit number, e.g. 6367 ÷ 28 = 227 remainder 11.



1x	28
2x	56
4x	112
5x	140
10x	280
20x	540

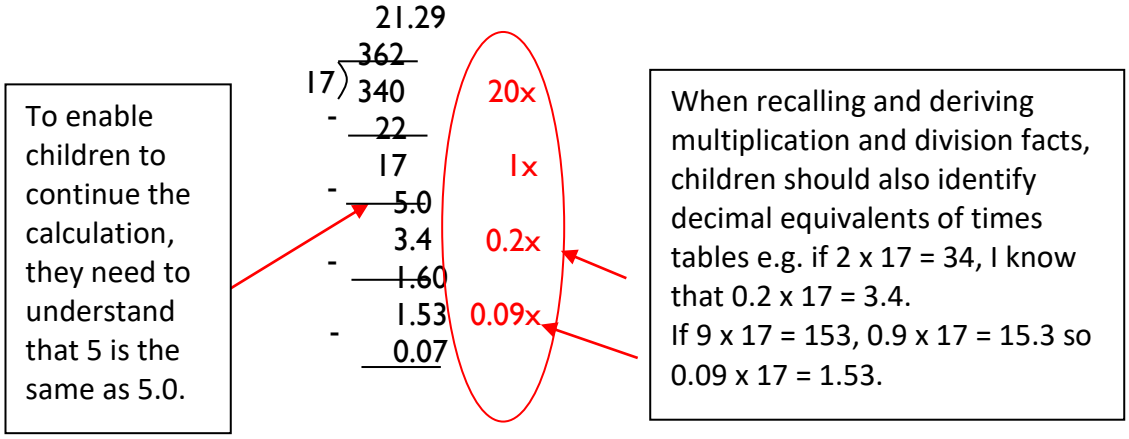
100x	2800
200x	5600
400x	11200
500x	14000

Groups of 28
Partial tables/key facts box

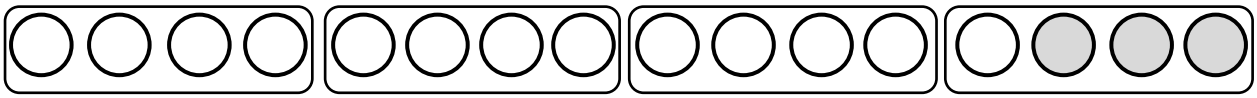
Children should be able to solve real life problems including those with money and measures. They need to be able to make decisions about what to do with remainders after division and round up or down accordingly.

In addition, children should also be able to use the chunking method and solve calculations interpreting the remainder as a decimal up to two decimal places, e.g. 362 ÷ 17

362 ÷ 17

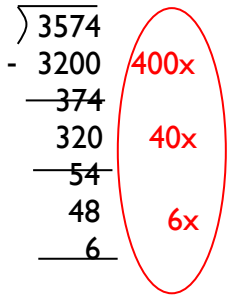


For simple fraction and decimal equivalents, this could also be demonstrated using a simple calculation such as 13 ÷ 4 to show the remainder initially as a fraction.



Using practical equipment, children can see that for 13 ÷ 4, the answer is 3 remainder 1, or put another way, there are three whole groups and a remainder of 1. This remainder is one part towards a full group of 4, so is $\frac{1}{4}$. To show the remainder as a fraction, it becomes the numerator where the denominator is the divisor (the number that you are dividing by in the calculation).

3574 ÷ 8



So 3574 ÷ 8 is $446\frac{6}{8}$

(when the remainder is shown as a fraction)

To show the remainder as a decimal relies upon children's knowledge of decimal fraction equivalents. For decimals with no more than 2 decimal places, they should be able to identify:

Half: $\frac{1}{2}$ = 0.5

Quarters: $\frac{1}{4}$ = 0.25, $\frac{3}{4}$ = 0.75

Fifths: $\frac{1}{5}$ = 0.2, $\frac{2}{5}$ = 0.4, $\frac{3}{5}$ = 0.6, $\frac{4}{5}$ = 0.8

Tenths: $\frac{1}{10}$ = 0.1, $\frac{2}{10}$ = 0.2, $\frac{3}{10}$ = 0.3, $\frac{4}{10}$ = 0.4, $\frac{5}{10}$ = 0.5, $\frac{6}{10}$ = 0.6, $\frac{7}{10}$ = 0.7, $\frac{8}{10}$ = 0.8, $\frac{9}{10}$ = 0.9

Reduce other equivalent fractions to their lowest terms.

In the example above, 3574 ÷ 8, children should be able to identify that the remainder as a fraction of $\frac{6}{8}$ can be written as $\frac{3}{4}$ in its lowest terms. As $\frac{3}{4}$ is equivalent to 0.75, the answer can therefore be written as 446.75