Shaftesbury
Primary School
Growing together

Calculation Policy
2020-2021
Year 5

Addition - Year 5

End of Year Expectation:
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.

① **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.

② Use the formal written method for the addition of decimal numbers:

£154.75 + £233.82 = £388.57

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

Ensure that the decimal points line up.

Key vocabulary add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, tens boundary, hundreds boundary, increase, vertical, 'carry', expanded, compact, thousands, hundreds, digits, inverse, decimal places, decimal point, tenths, hundredths, thousandths.

Subtraction - Year 5

End of Year Expectation:
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.

1 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

$$\begin{array}{r} 500+0+3 \\ -\,200+70+8 \\ \hline \end{array} \qquad \begin{array}{r} 400+90+13 \\ -\,200+70+8 \\ \hline 200+20+5 \end{array}$$

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

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

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

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

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

12731 – 1367 = 11364

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

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

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

£166.25 – £83.72 = £82.53

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

Ensure the decimal points line up.

Key vocabulary equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least count back, how many left, how much less is…, difference, count on, strategy, partition, tens units, take and make, exchange, digit, value, hundreds, inverse, tenths, hundredths, decimal point, decimal

Multiplication - Year 5

End of Year Expectation:
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).

1 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):

23 x 13 = 299

```
  23
 X13
   9   (3 x 3)
  60   (3 x 20)
 +30   (10 x 3)
 200   (10 x 20)
 299
```

2 Compact long multiplication (formal method):

23 x 13 = 299

Use the language of place value to ensure understanding.

Add the partial products.

```
  23
 X13
 +69
 230
 299
```

3 Two-digit numbers multiplied by two-digit numbers):

56 x 27 = 1512

```
  56
 X27
  42   (7x6)
 350   (7x50)
+120   (20x6)
1000   (20x50)
1512
 1
```

```
  56
 x27
 392
+1120
 1512
  1
```

4 When children are confident with long multiplication extend with three-digit numbers multiplied by a two-digit number. **124 x 26 = 3224**

```
  124
 X 26
 7424
+2480
 3224
 1 1
```

Use the language of place value to ensure understanding.

Add the partial products.

Extend with short and long multiplication of decimal numbers (initially in the context of money and measures), returning to an expanded method first (see Y6 guidance).

Expanded method .... Moving onto .... Compact long multiplcation.

Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times..., partition, grid method, multiple, product, tens, units, value, inverse, square, factor, integer, decimal, short/long multiplication, 'carry'

Division - Year 5

End of Year Expectation:
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.

1. Continue to practise the formal written method of long division with whole number answers.

184 ÷ 8 = 23

```
   2 3
8 ) 1 8 4
  - 1 6
    2 4
  - 2 4
      0
```

Use the language of place value to ensure understanding.

2. Continue to practise the formal written method of long division with remainders:

432 ÷ 5 = 86 r2

```
     8 6 r 2
5 ) 4 3 2
    4 0
      3 2
      3 0
        2
```

3. The remainder can also be expressed as a fraction, (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.

Key vocabulary share, share equally, one each, two each…, group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, multiple, divisible by, factor quotient, prime number, prime factors, composite number (non-prime)

Long division step by step guidance Years 4-6

Part 1 Dividing a 2 or more digit number by a one digit number

Divide :	2 → Dividing 7 tens by 3, we get 2 tens, and some extra. 3)74
Multiply :	2 3)74 6 → 3×2 tens = 60 tens.
Subtract :	2 3)74 −6 → Subtracting 6 tens from 7 tens 1
Bring down :	2 3)74 −6↓ 14 → 1 ten 4 ones = 14 ones
Repeat or find the Remainder :	24 → Dividing 14 ones by 3, we get 4 ones and some extra. 3)74 −6 14 −12 → 3×4 ones = 12 ones. 2 → Remainder

74 divided by 3 equals 24 r2

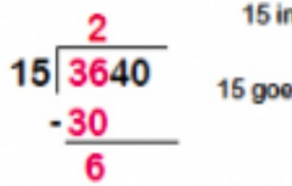
Use the steps to help teach long division to children.

Ask children to write DMSA and tick off as they go through the steps until they are confident.

Long division step by step guidance Years 4-6 Part 2.

Dividing by a two digit number.

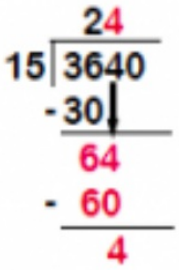
15 | 3640



15 into 3 doesn't go, so look at the next digit.

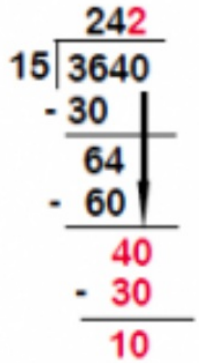
15 goes into 36 two times, so put a 2 above the 6.
15 x 2 = 30

Take that 30 away from the 36 to get your remainder.
36 - 30 = 6



Next, carry the 4 down to make 64.
15 goes into 64 four times, so put a 4 above the 4.
15 x 4 = 60

Take 60 from the 64 to get your remainder.
64 - 60 = 4



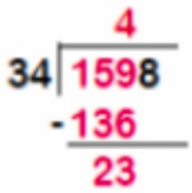
Carry the 0 down to make 40.

15 goes into 40 two times, so put a 2 above the 0.
15 x 2 = 30

Take 30 from the 40 to get your remainder.
40 - 30 = 10

34 | 1598

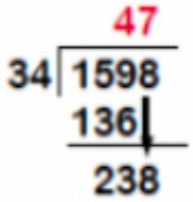
34 into 15 doesn't go, so , so look at the next digit.



How many times does 34 go into 159? You may not be able to do this in your head, so use trial and error and multiply 34 by various numbers to get a close answer. If we multiply 34 by 4 we get 136. We put a 4 over the 9 and then write 136 under the 159.
34 x 4 = 136

Take that 136 away from 159 to get your remainder.
159 - 136 = 23

Next, carry the 8 down to make 238.



We now have a new number: 238. We need to work out how many times 34 goes into this number by trial and error again.

34 x 7 = 238, so we write 7 over the 8 at the top.

Now we have our answer: 47.