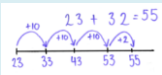# Written Calculation Policy

- This policy has been produced to support teachers in ensuring progression in written mathematics methods and to ensure that pupils develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written methods of calculation.

- Teachers are expected to revisit methods taught in previous years to ensure children are secure and ready to move onto new methods for written calculations.

- The document is written as a guide to aid end of year expectations, but pupils should still have the opportunity to use their preferred strategy

- Teachers are to plan regular revisits to teach standalone skills as well as planning for opportunities for the application of these methods across all areas of mathematics (and other curriculum areas when appropriate)

- This document can be used to aid differentiation and interventions to close the gaps in children's learning.

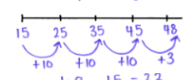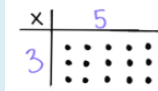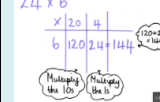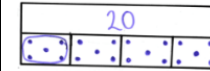|	Addition	Subtraction	Multiplication	Division
Y 3	**Consolidate adding single and double digits using concrete and pictorial** $4 + 2 = 6$ **Number line** $23 + 32 = 55$ Begin to use compact column addition to add numbers with 3 digits **(expanded method might help)** Begin to add like fractions e.g. $^3/_8 + ^1/_8 + ^1/_8$ Recognise fractions that add to 1 e.g. $^1/_4 + ^3/_4$ e.g. $^3/_5 + ^2/_5$	**Consolidate subtracting single and double digits** $8-3=5$ **using concrete and pictorial** Use counting up as an informal written strategy for subtracting pairs of 3-digit numbers eg $48 - 15 = 33$ (Tens) $40 - 10 = 30$ (ones) $8 - 5 = 3$ (Total) $30 + 3 = 33$ **(informal method)** Introduce column subtraction (decomposition), initially with TU-TU (not regrouping) moving onto regrouping. To ensure understanding of place value, introduce through the expanded method before the compact method. 49-31=18 $40+9$ 49 $-30+1$ leading to -31 $10+8$ 18 Begin to subtract like fractions e.g. $^7/_8 - ^3/_8$	**Consolidate subtracting single and double-digits using concrete and pictorial** Repeated addition number line $3 \times 5 = 15$ Arrays $3 \times 5 = 15$ Begin to Use partitioning (grid multiplication) to multiply 2-digit and 3-digit numbers by 'friendly' 1-digit numbers 24×6	**Consolidate subtracting single digits using concrete and pictorial** $9 \div 3 = 3$ $20 \div 4 = 5$ I Link to number sentences and inverse $42 \div 2 = 21$ $21 \times 2 = 42$ $15 \div 3 = 5$ $5 \times \boxed{?} = 15$ What is the missing number? introduce long division for TU÷U (no remainders) **ONLY WHEN SECURE** $738 \div 6$
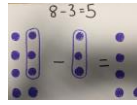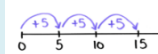
Y 4

Column addition for 3-digit and 4-digit numbers
(expanded might help)

```
  375
+ 132
    7   (5+2)
  100   (70+30)
  400   (300+100)
  507
```

(include decimals but only in the context of money)
Add like fractions
e.g. $^3/_5 + ^4/_5 = ^7/_5 = 1\,^2/_5$
Be confident with fractions that add to 1 and fraction complements to 1
e.g. $^2/_3 + \_ = 1$

Use compact column subtraction for 3- and 4-digit numbers
Use of a number line to look at finding change from money

If I have £5, and I spend £3.25, what would I have left?

```
  5p   20p   50p      £1
 £3.25 £3.30 £3.50        £5.00
£1= 50p+20p+5p+£1.75
```

Subtract like fractions
e.g. $^4/_5 - ^3/_5 = ^1/_5$

Revise and practise the grid method (TUxU and HTU x U)
Introduce expanded column method

```
       365
    x    2
Add   10  (5x2)
these 120 (60x2)
together 600 (300x2)
       730
```

Move onto formal 'short multiplication' for TUxU and HTU x U

```
  365
x   2
```

Use long division method to divide a 2-digit or a 3-digit number by a 1-digit number
Give remainders as whole numbers

```
      1 2 2
  6) 7 3 8        738÷6
   - 600  (6 x 100)
     138
   -  60  (6 x 10)
      78
   -  60  (6 x 10)
      18
   -  18  (6 x 3)
      00
```

Short BUS STOP ONLY WHEN SECURE
Begin to reduce fractions to their simplest forms
Find unit and non-unit fractions of larger amounts

	Addition	**ALL Children MUST**	**Subtraction**	**ALL Children MUST**	**Multiplication**	**ALL Children MUST**	**Division**	**ALL Children MUST**

Y 5

Addition

Use column addition to add two or three whole numbers with up to 5 digits

```
  27,234
+ 85,479
 112,713
```

Use column addition to add any pair of 2-place decimal numbers, (amounts of money)
Begin to add related fractions using equivalences
e.g. $^1/_2 + ^1/_6 = ^3/_6 + ^1/_6$

Subtraction

Use column subtraction to subtract numbers with up to 5 digits

```
  62,387
-  7,648
  54,749
```

Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000

If I have £5, and I spend £3.25, what would I have left?

```
  5p   20p   50p      £1
 £3.25 £3.30 £3.50        £5.00
£1= 50p+20p+5p+£1.75
```

Begin to subtract related fractions using equivalences
e.g. $^1/_2 - ^1/_6 = ^2/_6$

Multiplication

Use short multiplication to multiply a 1-digit number by a number with up to 4 digits
Use long multiplication to multiply 3-digit and 4-digit numbers by a number between 11 and 20 (before moving onto 21 to 99)

```
   2,374
 x    32
   4,748
  71,220
  75,968
```

Find simple percentages of amounts
e.g. *10%, 5%, 20%, 15% and 50% by dividing and multiplying*
Begin to multiply fractions and mixed numbers by whole numbers
e.g. $4 \times ^2/_3 = ^8/_3 = 2\,^2/_3$

Division

Use long division to divide a number with up to 4 digits by a number
Give remainders as whole numbers or as fractions
Move onto short Bus stop method

```
    1 5 7 1
 6) 9 4 2 6
```

Find non-unit fractions of large amounts
Turn improper fractions into mixed numbers and vice versa

| Y 6 | Use column addition to add numbers with up to 5 digits
Use column addition to add decimal numbers with up to 3 decimal places

$$\begin{array}{r}123\cdot024\\+368\cdot109\\\hline 491\cdot133\end{array}$$

Add mixed numbers and fractions with different denominators | Use column subtraction to subtract numbers with up to 6 digits

$$\begin{array}{r}^{6}7^{1}23\cdot4^{7}8^{1}2\\-\quad 82\cdot373\\\hline 641\cdot109\end{array}$$

Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000 or 10 000
Use complementary addition for subtractions of decimal numbers with up to 3 places, including money
Subtract mixed numbers and fractions with different denominators | Use short multiplication to multiply a 1-digit number by a number with up to 4 digits
Use long multiplication to multiply a 2-digit number by a number with up to 4 digits
Use short multiplication to multiply a 1-digit number by a number with 1 or 2 decimal places, including amounts of money

$$\begin{array}{r}432\cdot1\\\times\quad 13\\\hline 12\,96\cdot3\\4,3\,21\cdot0\\\hline 5,6\,17\cdot3\end{array}$$

Multiply fractions and mixed numbers by whole numbers
Multiply fractions by proper fractions
Use percentages for comparison and calculate simple percentages | Use short division to divide a number with up to 4 digits by a 1-digit or a 2-digit number
Give remainders as whole numbers or as fractions or as decimals

$$11\overline{)2{,}3^{2}1^{1}9}\quad\frac{210\ r9}{}$$

Divide a 1-place or a 2-place decimal number by a number using multiples of the divisors
To solve more challenging division problems using knowledge of factors

Divide proper fractions by whole numbers

$$756\div14=54$$ |