The ContinU Plus Academy

2025 - 2026

Calculation Policy

The ContinU Plus Academy

Policy Aim

To provide clear methods for written calculations that can be used by all members of staff when delivering basic arithmetic (addition, subtraction, multiplication and division) in lessons. This is part of standardising the delivery of numeracy across the school.

Guidance

Laid out below are the written methods students should use when performing basic arithmetic. Staff should use these when demonstrating such.

The methods are listed in order of numerical ability required. It is important that students use the method that they are comfortable with. This will be dependent on factors such as which mental and written methods they have been taught, so they must have a thorough understanding of their current working before moving on to the next method down. Teaching a student a set of rules for a method whose concept they cannot grasp will not help them progress. It will often cause misconceptions, which take time to undo. If in doubt revert to the simplest method available or check with a member of the mathematics team in advance.

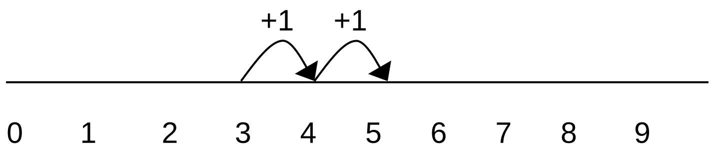
- Where a student has a different method that works for them, they should be allowed to continue using it.
- Mental arithmetic calculations can be performed in numerous ways. Students will develop these naturally and will not always replicate their written method; however a lack of understanding of their written method may lead to misconceptions when calculating mentally.

Addition

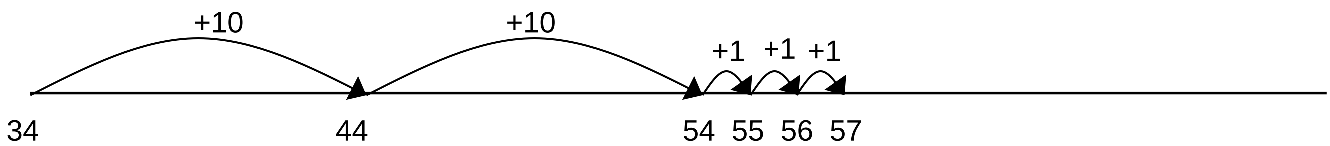
Number line

Drawing an empty number line helps record the steps taken in a calculation. The breakdown of the number you want to add will enable students to add small numbers together. The steps can be broken down as much or as little as required.

3 + 2 = 5



34 + 23 = 57



This enables students to become more efficient by adding the units in one jump (by using the known fact 4 + 3 = 7).

Partitioning

Partition the sum into tens and units, and then combine the answers. This method is potentially faster than the number line and can easily be extended to hundreds and beyond.

67 + 24 = 91

67 + 24	or	60 + 7
		<u>20 + 4</u>
80 + 11 = 91		80 + 11 = **91**

Column method

The following method should only be used once the concepts above are understood. Due to starting from the least significant number it would rarely be applicable to a mental method. However it is an efficient written method for larger sums.

625 + 48 = 673

```
  6 2 5
+   4 8
  6 7 3
    1
```

783 + 42 = 825

```
  7 8 3
+   4 2
  8 2 5
  1
```

367 + 85 = 452

```
  3 6 7
+   8 5
  4 5 2
  1 1
```

Using similar methods, students will

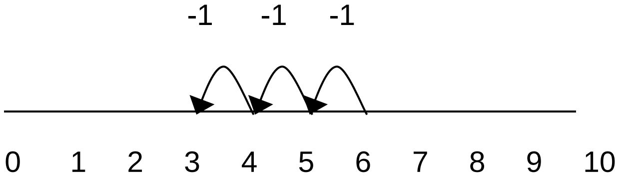
- *add several numbers with different numbers of digits*
- *apply the same steps and processes when adding decimals including those associated with money*
- *know that decimal points should line up under each other, particularly when adding mixed amounts, e.g. 401.2 + 26.85 + 0.71*

Subtraction

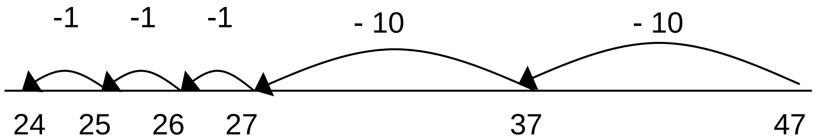
Number line

By counting in ones from the larger to the smaller number in manageable steps, these can then be added together to calculate the total difference. This method develops understanding of the link between subtraction and difference.

6 – 3 = 3



47 – 23 = 24



This helps students to become more efficient by subtracting the units in one jump (by using the known fact 7 – 3 = 4).

Partitioning

Partition the sum into hundreds, tens, and units. Subtract, starting from the units. Where this is not possible to subtract borrow from the next column. This method is an introduction to decomposition.

846 - 275 = 571

700   140
~~800~~   ~~40~~   6
\-   200   70   5
500   70   1 =   **571**

Column Subtraction (Decomposition)

Subtract the digits in columns, starting from the right hand side. To ensure accuracy note any changes from numbers you “borrow”. This method is the same as the partitioning method except place value is used to denote the significance of digits.

874 - 523 = 351

```
   8 7 4
-  5 2 3
   3 5 1
```

932 - 457 = 475

^{8}~~9~~ ^{12}~~3~~ ^{1}2
\- 4 5 7
4 7 5

Using similar methods, students will

- *Be able to subtract numbers with different numbers of digits*
- *Using this method, students should also begin to find the difference between two three-digit sums of money, with or without ‘adjustment’ from the pence to the pounds.* Alternatively, students can set the amounts to whole numbers, i.e. 895 – 438 and convert to pounds after the calculation.
- *Know that decimal points should line up under each other*

£8.95 - £4.38 = £4.57

£ 8 . ^{8}~~9~~ ^{1}5
\- £ 4 . 3 8
£ 4 . 5 7

895 - 438 = 457

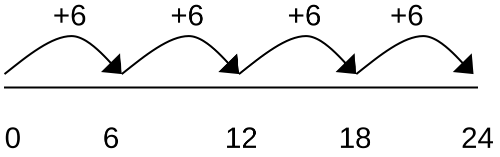
8 ^{8}~~9~~ ^{1}5
4 3 8
4 5 7 = £4.57

Multiplication

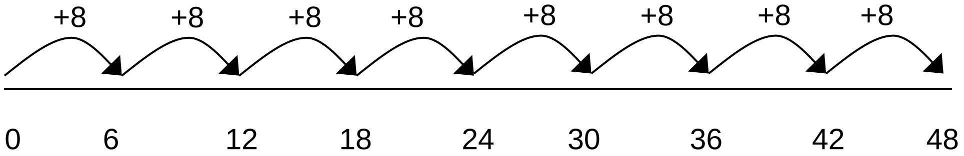
Number line

This method is useful when times table facts are not known. It can be restrictive due to its lack of efficiency for larger numbers, therefore the learning of times tables up to 12x12 should be encouraged at all opportunities.

4 x 6 = 24

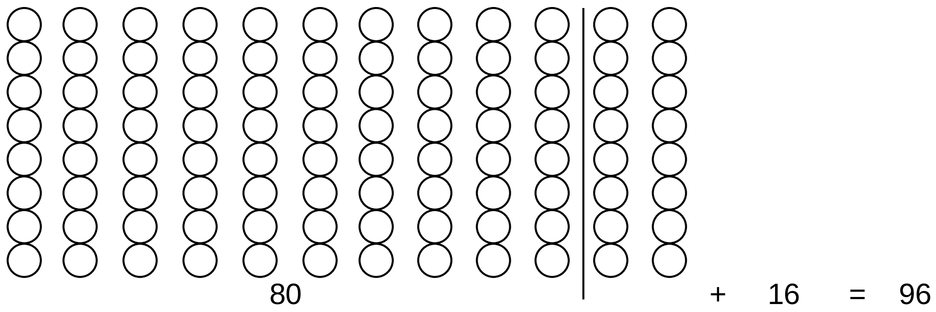


8 x 6 = 48



Arrays

12 x 8 = 96



Draw 8 rows of 12 dots (or 12 columns of 8 dots). Then add up all the dots. Try to look for ways to partition with multiplications facts that you know.

Partitioning

Break the larger numbers into smaller ones that you can work with. Working must be laid out so it is obvious how this has been done.

36 x 8 = 288

36 x 8
30 + 6
240 + 48 = 288

or

10 x 8 = 80
10 x 8 = 80
10 x 8 = 80
6 x 8 = 48
36 x 8 = 288

Grid method

The grid method is a formal way of partitioning. It is relatively efficient for large calculations but unlike more advanced methods still displays the significance of each number.

23 x 8 = 184

x	20	3
8	160	24

160
\+ 24
184

372 x 24 = 8928

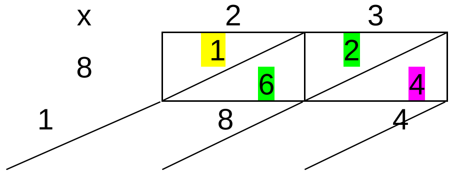
x	300	70	2
20	6000	1400	40
4	1200	280	8

7440
\+ 1488
8928
1

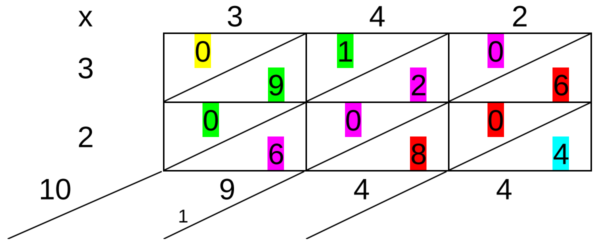
Lattice grid method

This method breaks down numbers even smaller than the grid method to enable students to recall multiplication facts from times tables. The grid is split diagonally to separate tens and units. With the final answer derived from adding up the diagonals starting from the right side of the table.

23 x 8 = 184



342 x 32 = 10944



Short multiplication

This begins the start of the traditional method adopted for multiplication. Set out using place value columns, then multiply by the units column then each column after in turn, remembering to carry underneath if necessary.

4332 x 4 = 17328

	TH	H	T	U
	4	3	3	2
x				4
	17	3	2	8
	1	1		

456 x 2 = 912

	H	T	U
	4	5	6
x			2
	9	1	2
	1	1	

Long multiplication

This is the traditional method of the multiplication of larger numbers. Start by setting out in place value columns. As in short multiplication multiply by the units, followed by tens and hundreds, Start a new row underneath and start by placing a “zero” in the units column, this is because you are now multiplying by the tens column. Continue the calculation multiplying out the numbers. Finally add the two rows to get the final answer.

3281 x 42 = 137802

			TH	H	T	U
			3	2	8	1
x					4	2
			6	5	6	2
+	1	3	^{1}1	^{1}2	4	0
	^{1}1	3	^{3}7	8	0	2
				1		

456 x 223 = 912

			H	T	U
			4	5	6
x			2	2	3
		1	3	6	8
+		9	^{1}1	^{1}2	0
	9	^{1}1	^{1}2	0	0
	10	^{1}1	6	8	8
	1				

Division

Sharing

48 ÷ 4 = 12

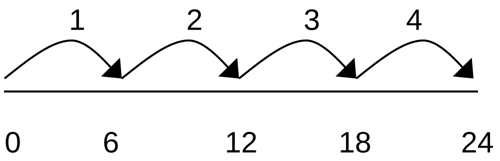
### ### //	### ### //
### ### //	### ### //

Draw 4 boxes and share the parts of the 48 into them. Depending on ability this may be tallied one at a time, or more quickly.

Number line - Counting on

Count up in steps until you reach the number. This method is useful when times tables are not known. It is restrictive in its lack of efficiency for larger numbers therefore the learning of times tables up to 12x12 should be encouraged at all opportunities.

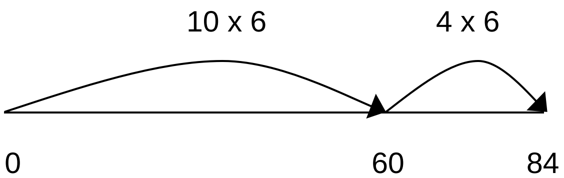
4 ÷ 6 = 24



Chunking (with a number line)

Count up in chunks until you reach the target number. The chunks can be as large or small as required. As understanding develops students will be expected to move away from the number line.

84 ÷ 6 = 14



Chunking

Work from simple multiples of the number you are dividing by, and build up towards the target. Once there, count how many lots were used.

221 ÷ 13 = 17

```
10 x 13 = 130
 5 x 13 =  65  +
          195
 2 x 13 =  26  +
17        221
```

Short division

This method can also be known as "bus stop division" due to the method used. Set out the sum with a bus stop placing the divisor outside. Work out how many of the divisor go into the first digit and place the number above. The remainder is carried over to the next digit. The process is repeated with the remainder of the digits.

7323 ÷ 3 = 2441

```
   2  4  4  1
3| 7 ¹3 ¹2  3
```

496 ÷ 11 = 45 r1

```
    0  4  5 r1
11| 4 ⁴9 ⁵6
```

432 ÷ 5 = 86□4

```
    0  8  6 • 4
5 | 4 ⁴3 ³2  •²0
```

Long division

This is a more advanced method of division used when dividing by larger numbers.

432 ÷ 15 = 28

```
            2 8
15 | 4  3  2 •0  □
        3  0           2 x  15
        1  3  2       43 -  30
           1  2  0     8 x  15
           1  2  0   132 - 120
              1  2 0
                   0
```

496 ÷ 11 = 45 r1

```
        2  8 r1
11| 4  9  6
       4  4      4 x 11
       5  6     49 - 44
       5  5      5 x 11
          1     56 - 55
```

432 ÷ 5 = 864

```
         8 6 • 4
5 | 4  3  2 • 0
       4  0        8 x  5
       3  2       43 - 40
       3  0        6 x  5
          2 •0    32 - 30
          4
          0
```

Points of interest

- When writing questions for students write them horizontally not vertically, this enables the student to select the method that best suits them
- Avoid using a comma to denote thousands, it is best to leave a small space as a comma can be misread as a decimal point