Calculation policy – Subtraction in Curriculum 2014
Progression of methods across the school

The following calculation policy has been devised to meet the requirements of the National curriculum 2014 for the teaching and learning of mathematics, and is designed to ensure a smooth and consistent, yet rapid progression of learning calculations across the school.

Guidance for use of the policy
- The following standards are what we would expect most children to achieve.
- Children achieving below the standards, for example children with S.E.N, will need to be given the method most appropriate for their level of achievement.
- Children achieving the expected standards in calculation will be provided with more opportunities to apply their calculations, at their age-related level, in more challenging contexts and problems.

A context for calculation
- Calculations should be given a real-life context.

Children should be encouraged to:

- **Approximate their answers before calculating.**
- **Check their answers after calculation using an appropriate strategy.**
- **Consider if a mental calculation would be appropriate before using written methods.**
- **Develop mental fluency and an understanding of problem solving.**
- **Use reasoning skills**
- **Use manipulatives or visualisation where appropriate**

THE FOLLOWING ARE STANDARDS THAT WE EXPECT THE MAJORITY OF CHILDREN TO ACHIEVE.

Foundation Stage and Year 1

Expectations of experience
- Children should have access to a wide range of counting equipment, everyday objects, bead strings and number lines that they can manipulate and handle.
- Numbers should be shown in different contexts.
- They are encouraged to develop a mental picture of the number system in their heads to use for calculation (visualisation).
- Children count on and back given numbers. They develop ways of recording calculations using pictures, number lines, hundred squares etc.
- Children should interpret number sentences and solve missing number problems such as 7 = ? - 9
- Be able to subtract one-digit and two-digit numbers to 20 and use number bonds to 20, in Year 1.
- *Find the distance/ amount between two values, including how many more*
  e.g. Seven is 3 more than four.
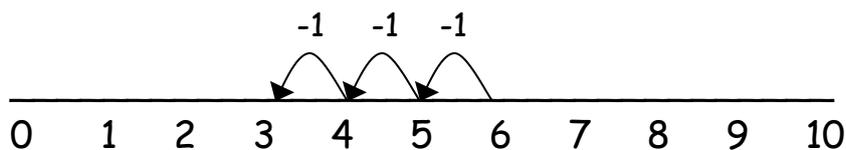 *e.g. I am 2 years older than my sister.*
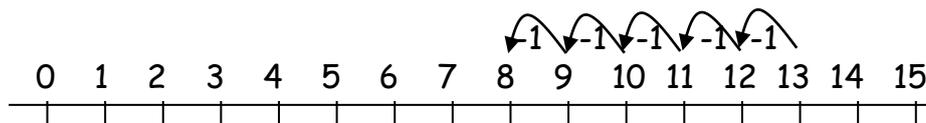
Pictorial representation

Number lines
Children use number lines and practical resources to support calculation.
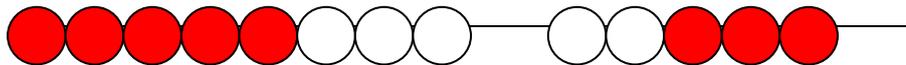Teachers *demonstrate* the use of the numberline.

6 – 3 = 3

13 – 5 = 8

Bead Strings/ bars

Bead strings, bead bars or base 10 can be used to illustrate subtraction including bridging through ten by counting back 3 then counting back 2.

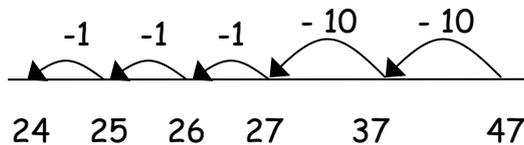13 – 5 = 8

Y2

Children will subtract using number lines
Children will subtract numbers using concrete objects and pictorial representations, hundred squares etc. and to build confidence in mental addition skills.

Number lines - Counting back
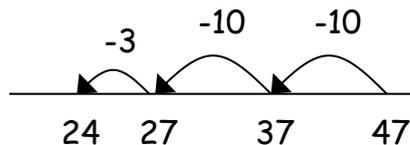
For subtracting pairs of 2-digit numbers and tens
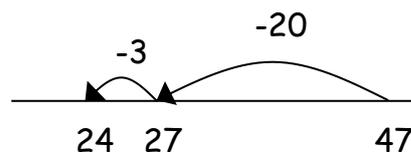
✓ First counting back in tens and ones.

47 – 23 = 24

✓ Children become more efficient by subtracting the units in one jump (by using the known fact 7 – 3 = 4).
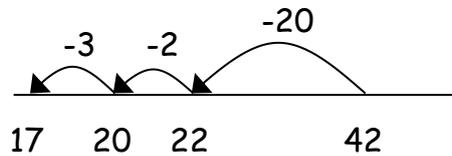
47 – 23 = 24

✓ Subtracting the tens in one jump and the units in one jump.

47 – 23 = 24

✓ Bridging through ten to help children become more efficient.

42 – 25 = 17

Counting on

If the numbers involved in the calculation are close together or near to multiples of 10, 100 etc., it can be more efficient to count on. Counting on should be taught as a strategy for subtracting **alongside** counting back.
The column method will be taught, supported by place value equipment.
Do not cross the tens boundary until children are fully secure with the method itself.

Using these methods, children will subtract numbers with up to 2 digits. For example:
✓ subtract two two-digit numbers
✓ three one-digit numbers   (including mentally)
✓ a two-digit number and tens (including mentally)
✓ a two-digit number and ones (including mentally)

Children will also:
Choose to subtract mentally, where appropriate.
Recall and use subtraction facts to 20, fluently and derive and use related facts up to 100.
Solve problems using number facts, place value and missing number problems.
Show that subtraction of one number from another cannot be done in any order.

Y3

Children will begin to subtract in columns and begin to exchange.

Partitioning and decomposition

This process should be demonstrated using arrow cards to show the partitioning and base 10 materials to show the decomposition of the number.

NOTE: When solving the calculation 89 – 57, children should know that 57 is what you are subtracting from the other number. Therefore, when using base 10 materials, children would need to count out only the 89.

```
  89   =     80  +  9
- 57         50  +  7
             30  +  2  = 32
```

Children begin to move on to **partitioning and decomposition, using manipulatives such as base 10 materials**
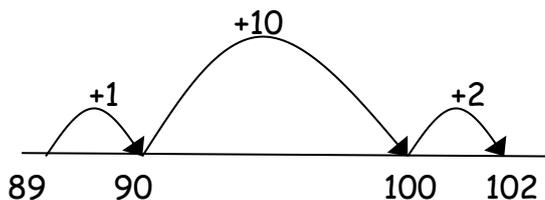
```
  794   =
-  56
```

This would be recorded by the children as

$$700 \rightarrow \cancel{90}^{80} \rightarrow {}^1 4$$
$$- \qquad\qquad 50 \rightarrow \quad 6$$
$$700 \rightarrow 30 \rightarrow \quad 8 \;=\; 738$$

When the numbers involved in the calculation are close together or near to multiples of 10, 100 etc., counting on as a mental strategy should be used.

102 – 89 = 13

6

Children should also be able to subtract mentally including:

- *A three digit number and ones*
- *A three digit number and tens*
- *A three digit number and hundreds*

Children will also:

Estimate and use inverse operations to check answers.

Solve problems using number facts, place value and missing number problems.

Y4

Children will subtract in columns and exchange, using base 10 materials.

Partitioning and decomposition

$$754 = $$
$$- \ 86$$

This would be recorded by the children as

$$
\begin{array}{ccccc}
\overset{600}{\cancel{7\!\!/0\!\!/0}} & \to & \overset{140}{\cancel{5\!\!/0\!\!/}} & \to & {}^{1}4 \\
- & & 80 & \to & 6 \\
\hline
600 & \to & 60 & \to & 8 & = & 668
\end{array}
$$

Decomposition

$$
\begin{array}{r}
{}^{6}\cancel{7}{}^{14}\cancel{5}{}^{1}4 \\
7\!\!\not{5}4 \\
- \ \ 86 \\
\hline
668 \\
\end{array}
$$

Using this method, children will:
- ✓ *subtract several numbers with different numbers of digits;*
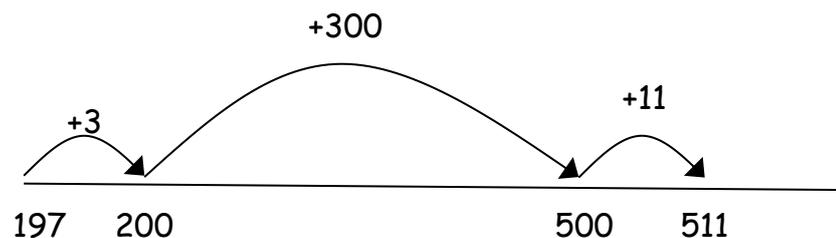- ✓ *subtract numbers with up to 4 digits;*

Children will also:
Choose to subtract mentally, where appropriate.
Estimate and use inverse operations to check answers.
Solve two-step problems in context.

Where the numbers involved in the calculation are close together or near to multiples of 10, 100 etc. counting on should be used.

511 – 197 = 314

8

Y5

Decomposition

```
   614 1
   7̶8̶4
 -  286
    468
```

Children should:

- ✓ *Be able to subtract numbers with more than 4 digits;*
- ✓ *Subtract numbers mentally, with increasingly large numbers,*
- ✓ *Use rounding to check answers to calculations and determine, in the context of a problem, the level of accuracy required.*
- ✓ *Estimate and use inverse operations to check answers.*
- ✓ *Solve multi-step problems in context.*

Where the numbers involved in the calculation are close together or near to multiples of 10, 100 etc. counting on should be used.

1209 – 388 = 821
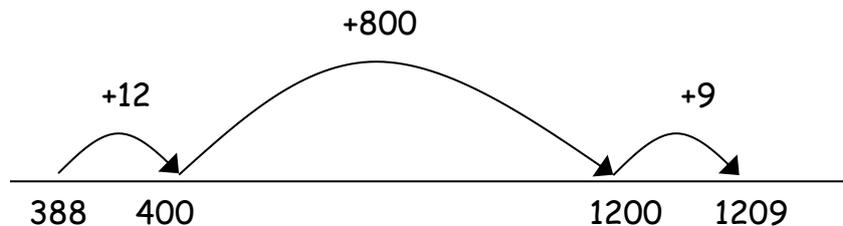
<u>Y6</u>

Children should be able to use decomposition to subtract numbers with different numbers of digits.

Decomposition

$$
\begin{array}{r}
{\scriptstyle 5\ 13\ \ \ 1} \\
6\!\!\!/4\!\!\!/67 \\
-\ \underline{2684} \\
3783
\end{array}
$$

Children should:

Where the numbers involved in the calculation are close together or near to multiples of 10, 100 etc counting on using a number line should be used.
Children should extend the methods, from Year 5, but with any number of digits, to solve multi-step problems, in context.
Children should also understand how to calculate using knowledge of the order of the 4 operations.
Be able to estimate with an appropriate degree of accuracy to check answers from problems.
Perform mental calculations including mixed operations and large numbers.

By the end of Year 6, children will have a range of calculation methods, mental and written. Selection will depend upon the numbers involved.

Children should not be made to go onto the next stage if:

1) **they are not ready.**
2) **they are not confident.**