Reception Year

- Calculations mostly use real objects. Simple recording using sketches and written numerals is modelled by the teacher.

Year 1

- Practical apparatus is used (counters, cubes, coins) and a 'number sentence' is recorded:

$$8 - 5 = 3$$

- Objects are sketched and then crossed out to represent 'taking away' (objects are often grouped in 5's to help children visualise numbers more clearly):
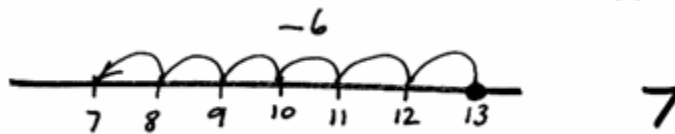
$$9 - 6 = 3$$

- Number lines are provided to support 'counting back' by hopping down one step at a time (pointing with finger).

Year 2

- Children begin to draw their own number lines:

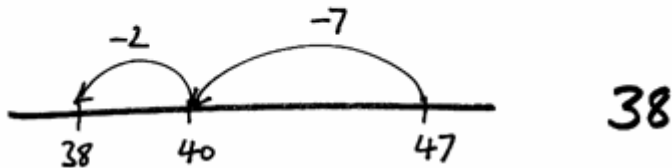$13 - 6$ " I start on 13. One hop takes me to 12. Another hop and another... ...six hops takes me back to 7. "

-6

7   8   9   10   11   12   13   7

Year 3

- Children draw their own empty number lines (lines without all the digits marked in)
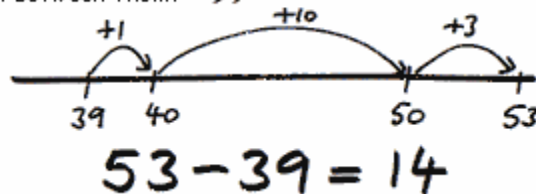
- They 'bridge' through 10's:

47 − 9

66 Taking 7 from 47 is easy: I land on 40. I know that 7 + 2 is 9 so I've got another 2 still to take away. That takes me to 38. 99

38

- A 'difference' can be calculated by adding on:

66 The difference between 53 and 39? I'll count up from the smaller to the bigger number. I can bridge through multiples of 10. Altogether there's 14 between them. 99

$$53 - 39 = 14$$

- Numbers are 'partitioned' (split up):

112 − 30

100 + 12 − 30

66 This is a bit tricky as I'll cross the 100 boundary. I'll partition 112 to make 100 plus 12. Now I can subtract 30 from 100 (that makes 70) and put back the 12 to make 82. 99

100 − 30 = 70

70 + 12 = 82

112 − 30 = 82

This recording represents a series of mental steps. Each step stands alone and is recorded on its own line. The steps are not connected with the = sign (because they're not equal).
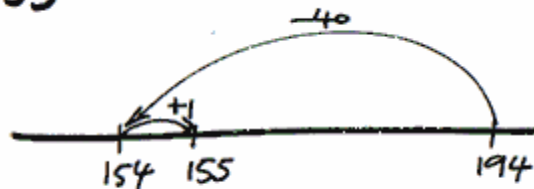
- 'Formal' recording is still horizontal (as a 'number sentence' - see Year 1, above).

Year 4

- 'Adjusting' is used where helpful, and is recorded on an empty number line (one without every number marked in):

194 − 39 = 155

66 39 is close to 40, which is a multiple of ten so I can handle that easily. I'll take 40 from 194; that's 154. If I've taken away 40 that's one too many so I'll add 1 back to give 155. 99

- 2- and 3-digit numbers are rounded to estimate answers:

725 − 477

" Roughly speaking this is: **700 − 500**

So an answer of about 200 will be right. **"**

- 'Counting up' is extended to larger values, always bridging through hundreds and tens boundaries where helpful:

432 − 397

" I'll count from the smaller to the bigger number. I'll bridge through the hundreds boundary (400). I don't need to break up what's left: one big hop to 432, making a difference of 35 altogether. **"**

+3   +32

397 400   432
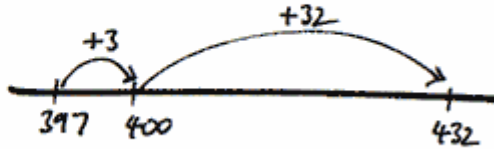
- Tens-and-Units numbers or Hundreds-Tens-and-Units numbers are 'decomposed' (broken into component parts):

124 − 79

$$
\begin{array}{r}
100 + 20 + 4 \\
- \qquad 70 + 9
\end{array}
$$

" 124 is 100 + 20 + 4.
I need to subtract 70 and 9.
I can't subtract 9 from 4 in the units column so…

$$
\begin{array}{r}
100 + 10 + 14 \\
- \qquad 70 + 9
\end{array}
$$

…I'll exchange 1 ten from the next column to make 14.
I can't subtract 70 from 10 in the tens column so…

$$
\begin{array}{r}
110 + 14 \\
- \quad 70 + 9 \\
\hline
40 + 5
\end{array}
$$

…I'll take the 100 from the next column to make 110.

Now I can complete the calculatation. **"**

This approach is long-winded (in the example above it would have been more efficient to subtract 80 and adjust by adding 1) but it sets the scene for the formal written method:

- The formal written method for subtraction (see below) is introduced.

Year 5

- Vertical recording, illustrating decomposition (breaking into component parts) in alternative ways:

74 − 27

$$
\begin{array}{r}
\overset{60}{\cancel{70}} + \overset{14}{\cancel{4}} \\
- \ 20 + 7 \\
\hline
40 + 7
\end{array}
\qquad \text{or} \qquad
$$

As learners rely less and less on the 'in-between steps' this quickly becomes the familiar formal written method. Children speak of 'exchanging' from higher columns (the potentially confusing notion of 'borrowing' is not used):

$$
\begin{array}{r}
\overset{6}{\cancel{7}}\overset{1}{}4 \\
- 27 \\
\hline
47
\end{array}
$$

Year 6

- The continued need to use jottings to support mental methods of subtraction is emphasised where helpful
- Existing methods are extended to larger values and modified slightly to handle decimal numbers (ensure columns are lined up either side of the decimal point)
- Estimation, to check the size of answers, remains crucial (especially when using a calculator)
- No wholly new methods of subtraction are employed.