Stages in Subtraction

Subtraction – Stage 1

Children will engage in a variety of counting songs and rhymes and practical activities.

In practical activities and through discussion they will begin to use the vocabulary associated with subtraction.

They will find one less than a given number.
They will begin to relate subtraction to 'taking away' using objects to count 'how many are left' after some have been taken away.

6 – 2 = 4

'Take two apples away. How many are left?'
Children will begin to count back from a given number.

Subtraction – Stage 2

Given a number, identify one less

Read, write and interpret mathematical statements involving subtraction (-) and the equals (=) sign

Subtract one- digit and two-digit numbers within 20, including zero

 Solve missing number problems eg 20 - = 15

Ensure that children are confident with the methods outlined in the previous stage's guidance before moving on.

Children will continue to practise counting back from a given number.
Initially use a number track to count back for subtraction:
Initially use a number track to count on for addition, counting on from the largest number:

9 – 5 = 4

'Put your finger on number nine. Count back 5.'

Subtraction – Stage 3

Subtract numbers using concrete objects, pictorial representations, and mentally, including:

- A two digit number and ones
- A two digit number and tens
- Two two-digit numbers

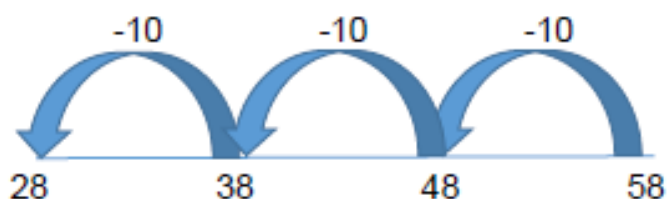NB Ensure that children are confident with the methods outlined in the previous stage's guidance before moving on.
Counting back using an empty number line within 100, in ones…
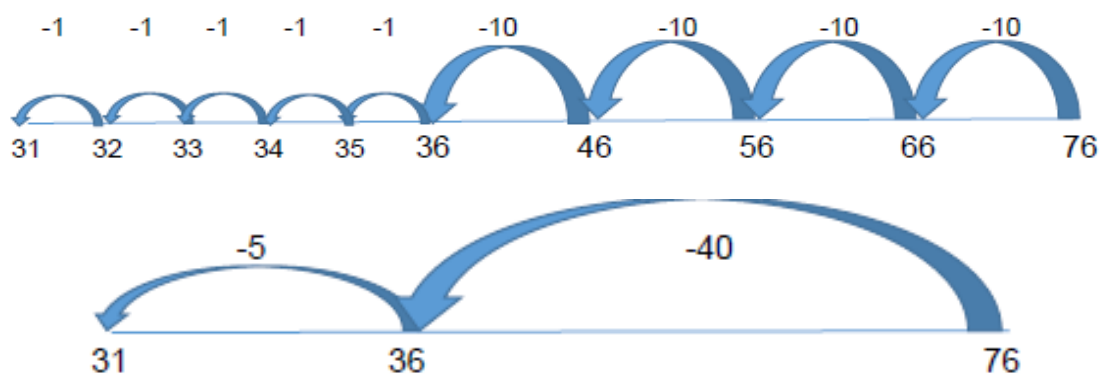
$$34 - 6 = 28$$

…and in tens

$$58 – 30 = 28$$

Use in conjunction with a 100 square to show jumps of tens.
Subtraction, using partitioning, on an empty number line:

76 – 45 = 31

Use in conjunction with a 100 square to show jumps of tens and ones.
If children are confident, use more efficient jumps…

Use in conjunction with a 100 square to show jumps of tens and ones/units.

Counting on to find a small difference

Introduce complementary addition to find differences (only use for small differences).
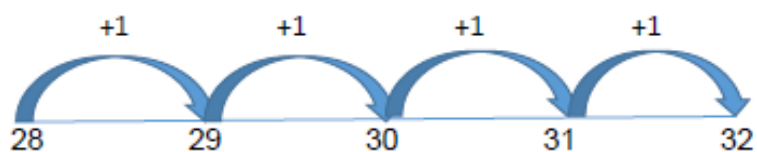The use of models is extremely important here to understand the idea of "difference" (see stage 2 guidance).
Count up from the smallest number to the largest to **find the difference**.

$12 - 8 = 4$
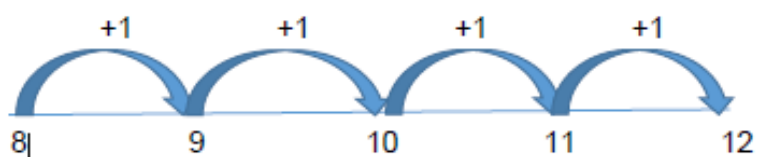
'The difference between 8 and 12 is 4.'

$32 - 28 = 4$

Further develop subtraction with numbers that bridge 100, using a 200 grid to support. **NB** If, at any time, children are making significant errors, return to the previous stage in calculation.
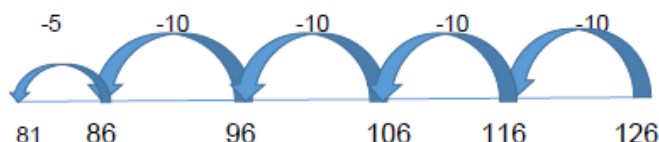
Subtraction – Stage 4

Subtract numbers with up to three digits, using formal written method of columnar subtraction

NB Ensure that children are confident with the methods outlined in the previous stage's guidance before moving on.
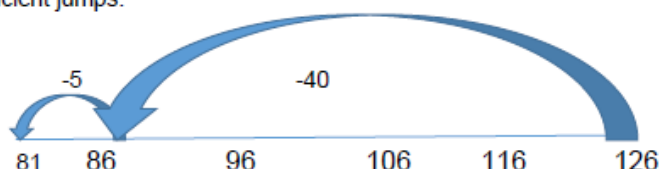Further develop the use of the empty number line with calculations that bridge 100:

$126 - 45 = 81$

Use practical equipment to support counting back in tens and bridging 100 such as 200 grid, Numicon, Cuisinaire rods etc.
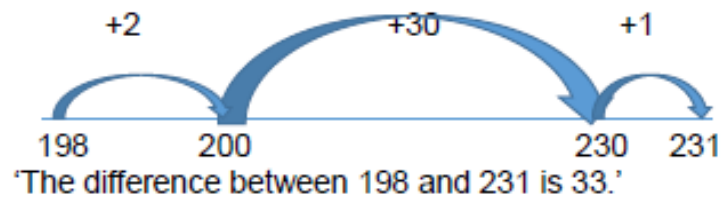
Then use more efficient jumps:

Extend with larger numbers by counting back…

216 − 27 = 189

…and by counting on to find the difference (small difference):

231 − 198 = 33

'The difference between 198 and 231 is 33.'

Introduce the **expanded written method** with the calculation presented both horizontally and vertically (in columns) and **supported with practical activities**. Use two-digit numbers when introducing this method, initially:

78 − 23 = 55

70 and 8
−20 and 3
50 and 5 = 55

'Partition numbers into tens and ones. Subtract the ones, and then subtract the tens. Recombine to give answer.'
Use practical activities (such as Dienes) to support the teaching of this method.

NB In this example decomposition (exchange) is not required.

You may replace the 'and' with a + symbol or give the place value column headings to avoid confusion.

This will lead into the **formal written method**:

7 8
-2 3
5 5

Use the language of place value to ensure understanding.
'Eight subtract three, seventy subtract twenty.'

NB A number line would be an appropriate method for this calculation but use two digit numbers to illustrate the formal written method initially.

Introduce the **expanded written method** where **exchange/decomposition** is required:

73 – 27 = 46

70 + 3	becomes	60 and13	73 is partitioned into 60 and 13
- 20 + 7		- 20 and 7	in order to calculate 73 - 27
		40 + 6 = 46	

This can be demonstrated practically and does not have to be recorded

NB children will need to practise partitioning numbers in this way. **Base- ten materials** could be used to support this (such as Dienes).

When **children are confident** with the expanded method introduce the **formal written method**, involving **decomposition/exchange**:

73 – 27 = 46

$\begin{array}{r} 6\ \ 13 \\ \not{7}\ \not{3} \\ 2\ 7 \\ \hline 4\ 6 \end{array}$

Use the language of place value to ensure understanding.
'We can't subtract seven from 3, so we need to exchange a ten for ten ones to give us 60 and 13.

Use **base ten / Dienes** materials to support understanding

If children are confident, extend the use of the formal written method with **numbers over 100**, returning to the expanded method first, if necessary.

235 – 127 = 108

235 – 127 = 108

$\begin{array}{r} 2\ \ 15 \\ 2\ 3\ \not{5} \\ -1\ 2\ 7 \\ \hline 1\ 0\ 8 \end{array}$

Use the language of place value to ensure understanding. In this example, it has only been necessary to exchange from the tens column.

Use **base ten / Dienes** materials to support understanding

Use the language of place value to ensure understanding.
Use **base ten / Dienes** materials to support understanding

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

Subtraction – Stage 5

Subtract numbers with up to 4 digits using the formal written method of columnar subtraction where appropriate

NB Ensure that children are confident with the methods outlined in the previous stage's guidance before moving on.
Continue to teach the use of **empty number lines** with three and four digit numbers, as appropriate.

Continue to develop the **formal written method of subtraction** by revisiting the expanded method first, if necessary. Continue to use **base –ten / Dienes** materials to support understanding.

$258 - 73 = 185$

200	and	50	and	8		100	and	150	and	8
•		70	and	3	becomes	-		70	and	3
						100	and	80	and	5 = 185

This can be demonstrated practically and does not have to be recorded

This leads to the **formal written method**, involving decomposition…

```
1      15
2      5    8
-      7    3
1      7    5
```

Use the language of place value to ensure understanding
In this example, it has been necessary to exchange from the hundreds column.

Further develop by subtracting a three-digit number from a three-digit number:

$637 - 252 = 385$

600	(and) 30	(and) 7		500	(and) 130	(and) 7	
-200	(and) 50	(and) 2		-200	(and) 50	(and) 2	
				300	(and) 80	(and) 5	= 385

Ensure that children are confident in partitioning numbers this way.

This leads to a **formal written method**:

```
5      13
6      3    7
-2     5    2
3      8    5
```

Use the language of place value to ensure understanding and use base-ten / Dienes materials, if necessary.

When **children are confident**, develop with four-digit numbers and decimal numbers (in context of money and measures).

$$3625 - 1219 = 2406$$

			1	15
3	6	2̶	5̶	
-1	2	1	9	
2	4	0	6	

NB. If, at any time, children are making significant errors, return to the previous stage in calculation.

Subtraction – Stage 6

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 stage's guidance before moving on. Continue to teach the use of **empty number lines** with larger numbers and decimals, as appropriate.

Continue to develop the formal written method for subtraction with three and four digit numbers (see stage 5 guidance), returning to an expanded method and using base Ten / Dienes materials, if necessary.

$$503 - 278 = 225$$

500	0	3		400	90	13	
- 200	70	8		- 200	70	8	
				200	20	5	

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

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

4	9	13
5̶	0̶	3̶
-2	7	8
2	2	5

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 10 ones/units.

NB It would be appropriate to discuss the use of mental calculation methods with an example like this one, i.e. would an empty number line be a more efficient method for these numbers?

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

$$12731 - 1367 = 11364$$

		6	12	11
1	2	7̶	3̶	1̶
-	1	3	6	7
1	1	3	6	4

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

NB If children are making significant errors, provide calculations where only one exchange is required.
Introduce subtraction of decimals, initially in the context of money and measures.

£166.25 – £83.72 = £82.53

```
  16 5   12
1 6̶ 6̶ . 2̶ 5          Ensure the decimal point lines up.
-8 3 . 7 2
 8 2 . 5 3
```

Continue to practise and apply the formal written method with large numbers and decimals throughout year five.
NB If, at any time, children are making significant errors, return to the previous stage in calculation.

Subtraction – Stage 7

No objectives have been included in the programmes of study explicitly related to written methods for subtraction in Y6. However, there is an expectation that children will continue to practice and use the formal written method for larger numbers and decimals and use these methods when solving problems, when appropriate (see previous stage' guidance for methods).

Our aim is that by the end of Y6 children use mental methods (with jottings) when appropriate, but for calculations that they cannot do in their heads, they use an efficient formal written method accurately and with confidence.