



Stages in Addition

Addition – Stage 1

Children will engage in a wide variety of songs and rhymes, games and activities. They will begin to relate addition to combining two groups of objects, first by counting all and then by counting on from the largest number.

They will find one more than a given number.

In practical activities and through discussion they will begin to use the vocabulary involved in addition.



'You have five apples and I have three apples. How many apples altogether?'

Addition – Stage 2

- Given a number, identify one more.
- Read, write and interpret mathematical statements involving addition (+) and the equals (=) sign
- Add one- digit and two-digit numbers within 20, including zero
- Solve missing number problems eg $10 + = 16$

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

Children will continue to practise counting on from any number e.g. 'Put five in your head and count on four.'

Initially use a number track to count on for addition, counting on from the largest number:

$5 + 4 = 9$

'Put your finger on number five. Count on (count forwards) four.'

$6 + 6 = 12$

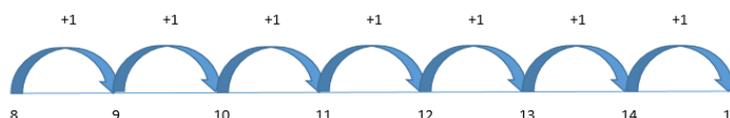
Then progress to a marked number line: $6 + 6 = 12$



'Put your finger on number six and count on six.' $8 + 7 = 15$

'Put your finger on number eight and count on seven.'

+1 +1 +1 +1 +1 +1 +1



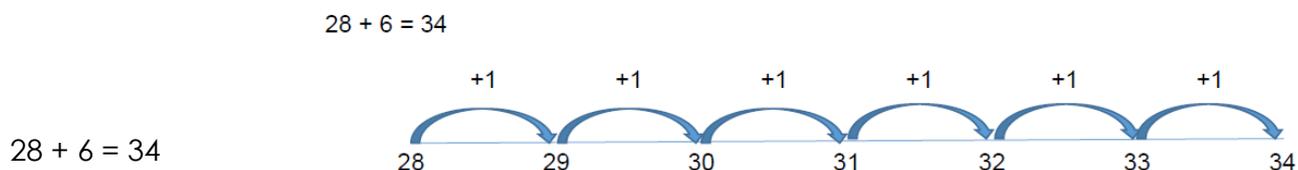
Ensure children are confident with using a marked number line before moving on to an empty number line (see stage 3 guidance). Continue to practise counting on from the largest number for addition with totals within 20.

Addition – Stage 3

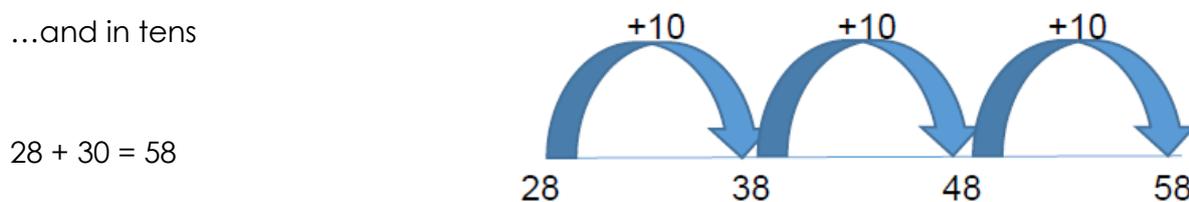
- Add numbers using concrete objects, pictorial representations, and mentally, including:
 - A two digit number and ones
 - A two digit number and tens
 - Two two-digit numbers
 - Three one-digit numbers

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

Counting on in ones using an empty number line, within 100...

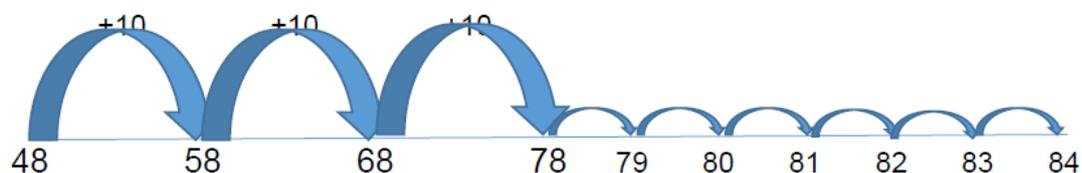


...and in tens



Use in conjunction with a 100 square to show jumps of tens.

$48 + 36 = 84$



'Put the biggest number first (48), and then partition the smaller number ($36 = 30 + 6$) and count on: $48 + 30 + 6$.'

$$+10 +10 +10$$

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.
Also use the partitioning method to add two two-digit numbers:

$$\begin{aligned} 43 + 25 &= 68 \\ 40 \ 3 \ 20 \ 5 \\ 40 + 20 &= 60 \\ 3 + 5 &= 8 \\ 60 + 8 &= 68 \end{aligned}$$

'Partition the numbers into tens and ones.
Add the tens together and then add the ones together.
Recombine to give the answer'.
Then move on to calculations that **bridge** the tens:

$$\begin{aligned} 48 + 36 &= 40 + 8 + 30 + 6 \\ 40 + 30 &= 70 \\ 8 + 6 &= 14 \\ 70 + 14 &= 84 \\ 48 + 36 &= 84 \end{aligned}$$

This is an alternative way of recording the partitioning method.
Further develop addition 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.

Addition – Stage 4

Add numbers with up to three digits, using formal written method of columnar addition

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

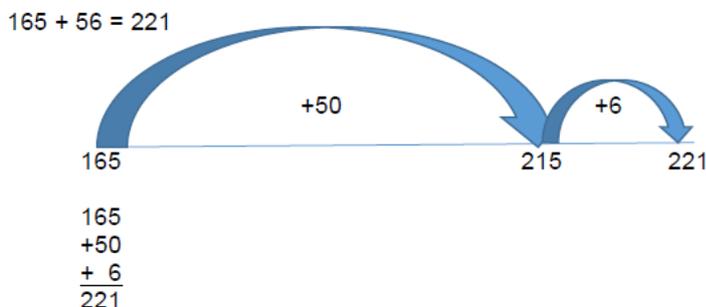
Further develop the use of the **empty number line** with calculations that **bridge 100**:

$$\begin{array}{r} 78 + 46 = 124 \\ +40 +6 \\ \hline 78 \ 118 \ 124 \end{array}$$

$$78 + 46 = 124$$



Use a 200 grid to support counting on in tens and bridging 100...
 ... and with addition of a three-digit and a two -digit number:



The partitioning method can also be used with three-digit numbers. Introduce the **expanded written method** with the calculation presented both horizontally and vertically (in columns).

Initially use calculations where it has not been necessary to bridge across the tens or hundreds:

$63 + 32 = 95$

60 and 3
 + 30 and 2
 90 and 5 = 95

'Partition the numbers into tens and ones. Add the tens together and then add the ones together. Recombine to give the answer.'

Then...

6 3
 + 3 2
 5 (ones)
 9 0 (tens)
 9 5

Add the least significant digits (ones) together first and then the tens in preparation for the formal written method. Writing the units and tens is not necessary as long as the children understand the method.

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

6 3
 + 3 2
 9 5

Use the language of place value to ensure understanding: 'Three add two equals five. Write five in the ones column. 60 add 30 equals 90. Write 9 (90) in the tens column.'

NB Informal/mental methods would be more appropriate for numbers of this size, but use two-digit numbers when introducing the columnar method.

Then introduce calculations where it is necessary to bridge:

$\begin{array}{r} 68 \\ + 24 \\ \hline 12 \text{ (ones)} \\ 80 \text{ (tens)} \\ \hline 92 \end{array}$	<p>Add the least significant digits (ones) together first and then the tens in preparation for the formal written method.</p> <p>Writing the units and tens is not necessary as long as the children understand the method.</p>
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If children are ready, introduce the formal written method, where it is necessary to 'carry' ten from the ones to the tens column:

$$\begin{array}{r} 68 \\ + 24 \\ \hline - 92 \\ \hline 1 \end{array}$$

Use the language of place value to ensure understanding:
 'Eight add four equals 12. Write two in the ones column and 'carry' one (10) across into the tens column. 60 add 20 and the ten we 'carried' equals 90. Write 9 (90) in the tens column. 92 is the answer.'

The digit that has been 'carried' should be recorded under the line in the correct column.

When **children are confident**, extend with examples where it is necessary to bridge across the tens and the hundreds:

$$76 + 47 = 123$$

$$\begin{array}{r} 76 \\ + 47 \\ \hline 13 \text{ (ones)} \\ 110 \text{ (tens)} \\ \hline 123 \end{array}$$

Add the least significant digits (ones) together first and then the tens in preparation for the formal written method.

Writing the ones and tens is not necessary as long as the children understand the method.

If children are ready introduce the formal written method, where it is necessary to 'carry' across the columns and bridge 100:

$$76 + 47 = 123$$

$$\begin{array}{r} 47 \\ + 76 \\ \hline 123 \\ \hline 11 \end{array}$$

Use the language of place value to ensure understanding:
 'Seven add six equals 13. Write 3 in the ones column and 'carry' one (10) across to the tens column. 40 + 70 and the ten that we 'carried' equals 120. Write 2 (20) in the tens column and 'carry' one (100) across into the hundreds column (100).

The digits that have been 'carried' should be recorded under the line in the correct column.

If **children are confident**, further develop with the addition of a three- digit number and a two -digit number:

$$178 + 43 = 221$$

$$\begin{array}{r} 178 \\ + 43 \\ \hline 221 \\ \hline 11 \end{array}$$

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

Addition – Stage 5

Add numbers with up to 4 digits using the formal written method of columnar addition 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.

Further develop the formal written method of addition, with three-digit numbers. Revisit the **expanded method** first, if necessary:

$$176 + 147 = 323$$

$$\begin{array}{r} 176 \\ + 147 \\ \hline 13 \quad (\text{ones}) \\ 110 \quad (\text{tens}) \\ + 200 \quad (\text{hundreds}) \\ \hline 323 \end{array}$$

Writing the ones and tens is not necessary as long as the children understand the method.

This will lead into the formal written method...

$$176 + 147 = 323$$

The digits that have been 'carried' should be recorded under the line in the correct column.

If children are confident, introduce the addition of a four-digit number and a three digit number:

$$1845 + 526 = 2371$$

$$\begin{array}{r} 1845 \\ + 526 \\ \hline 2371 \\ \hline 1 \quad 1 \end{array}$$

Continue to develop with addition of two four-digit numbers and with decimals (in the context of money or measures).

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

Addition – Stage 6

Add whole numbers with more than 4 digits, including using formal written method (columnar addition)

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 addition with larger numbers (and decimal numbers) and with the addition of three or more numbers:

$$21848 + 1523 = 23371$$

$$\begin{array}{r} 21848 \\ + 1523 \\ \hline 23371 \\ \hline 1 \quad 1 \end{array}$$

Continue to use the language of place value to ensure understanding. Ensure that the digits that have been 'carried' are recorded under the line in the correct column.

Use the **formal written method** for the addition of decimal numbers:

$$£154.75 + £233.82 = £388.57$$

Continue to use the language of place value to ensure understanding.

$$\begin{array}{r} 154.75 \\ + 233.82 \\ \hline 388.57 \\ \hline 1 \end{array}$$

Ensure that the decimal points line up.

Continue to practise and apply the formal written method throughout stage 6.

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

Addition – Stage 7

Children will continue to practise and use the formal written method for larger numbers and decimals and use these methods when solving problems, when appropriate (see previous stage's 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.