

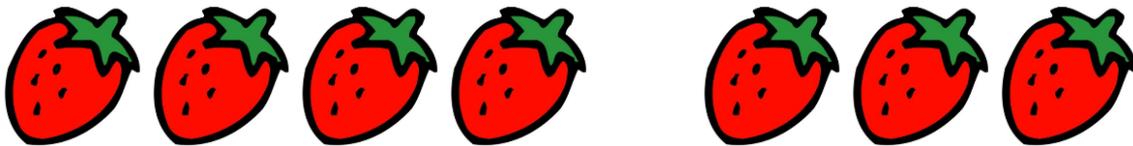
## Stages in Addition

### Addition – Early Stages (EYFS)

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 four strawberries and I have three strawberries. How many strawberries are there altogether?’

### Addition - Year One

- Identify one more than a given number.
- Read, write and interpret mathematical statements involving addition (+) and equals (=) signs.
- Add one-digit and two-digit numbers within 20, including zero.
- Solve missing number problems. For example:

$$8 + \square = 15$$

Children will continue to practise counting on from any number. For example: ‘Put four in your head and count on three.’

Initially use a number track, counting on from the largest number:

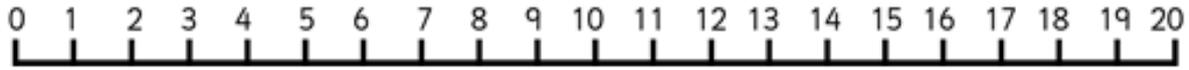


$$4 + 3 = 7$$

‘Put your finger on number four. Count on/count forwards/jump along to the right three.’

Then progress to a marked number line:

$$7 + 5 = 12$$



‘Put your finger on number seven and count on five.’

Ensure children are confident with using a marked number line before moving on to an empty number line (see Year Two guidance).

Continue to practise counting on from the largest number for addition with totals within 20.

### **Addition - Year Two**

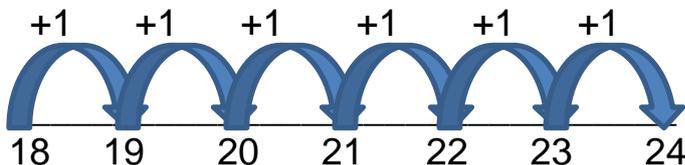
Ensure children are confident with the methods outlined in the previous year’s guidance before moving on.

**Add numbers using concrete objects, pictorial representations, and mentally, including:**

- a two digit number and units (ones)
- a two digit number and tens
- two two-digit numbers
- three one-digit numbers

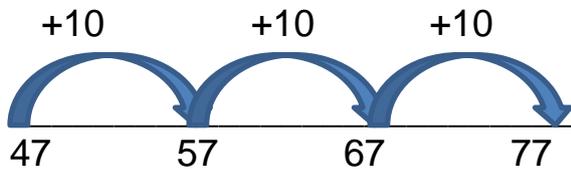
**Statutory mental calculation expectations:**

- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.



$$18 + 6 = 24$$

... and in tens...

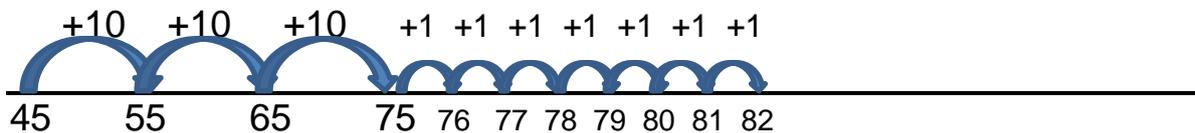


$$47 + 30 = 77$$

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

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

'Put the biggest number first (45), and then partition the smaller number ( $37 = 30 + 7$ ) and count on:  $45 + 30 + 7$ .'

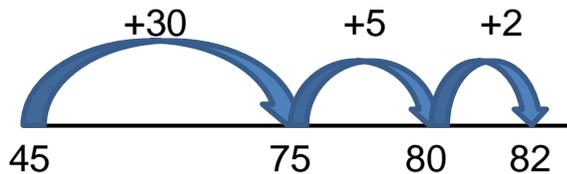


$$45 + 37 = 82$$

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

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

If children are confident, use more efficient jumps...



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

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

$$\begin{array}{r}
 52 \\
 / \quad \backslash \\
 50 \quad 2
 \end{array}
 +
 \begin{array}{r}
 24 \\
 / \quad \backslash \\
 20 \quad 4
 \end{array}
 = 76$$

$$50 + 20 = 70$$

$$2 + 4 = 6$$

$$70 + 6 = 76$$

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

Then move on to calculations that bridge the tens:

$$37 + 26 = 30 + 7 + 20 + 6$$

$$30 + 20 = 50$$

$$7 + 6 = 13$$

$$50 + 13 = 63$$

$$37 + 26 = 63$$

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.

### **Mathematical vocabulary for addition Key Stage 1**

add	addition	total	plus	sum
number bonds	make	altogether	double	near double
number line	more	total	How many more is...?	How much more is...than...?
How many more to make...?	one more	two more	ten more	hundred more

### **Addition - Year Three**

- **Add numbers with up to three digits, using formal written method of column addition**

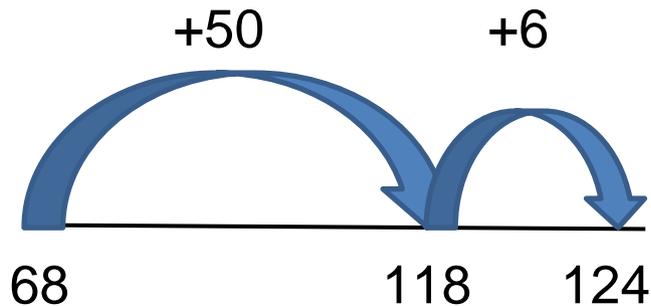
#### **Statutory mental calculation expectations:**

Add and subtract numbers mentally, including:

- a three-digit number and units (ones).
- A three-digit number and tens

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

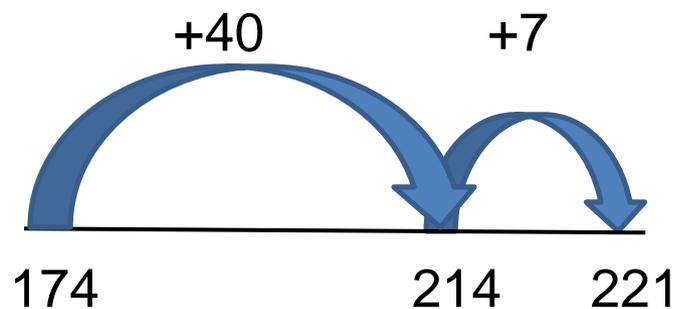
$$68 + 56 = 124$$



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:

$$174 + 47 = 221$$



Further develop the partitioning method with calculations that bridge 100:

$$76 + 48 = 70 + 6 + 40 + 8$$

$$70 + 40 = 110$$

$$6 + 8 = 14$$

$$110 + 14 = 124$$

$$76 + 48 = 124$$

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:

$$55 + 43 = 98$$

$$\begin{aligned} &50 + 5 \\ &+ 40 + 3 \\ &90 + 8 = 98 \end{aligned}$$

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

Then...

$$\begin{array}{r} 55 \\ + 43 \\ \hline 8 \text{ (5+3)} \\ \underline{90} \text{ (50+40)} \\ 98 \end{array}$$

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

This will lead into the formal written method...

$$\begin{array}{r} 55 \\ + 43 \\ \hline 98 \end{array}$$

Use the language of place value to ensure understanding:  
'Five add three equals eight. Write 8 in the units column. 50 add forty equals 9 (90) in the tens column.'

Then introduce calculations where it is necessary to bridge, returning to the expanded method at first:

$$58 + 27 = 85$$

$$\begin{aligned} &50 + 8 \\ &+ 20 + 7 \\ &\underline{\quad} \\ &70 + 15 = 85 \end{aligned}$$

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

Next...

$$\begin{array}{r} 58 \\ + 27 \\ \hline 15 \quad (8 + 7) \\ \underline{70} \quad (50 + 20) \\ 85 \end{array}$$

'Add the least significant digits (units) together. Then add the tens together. Recombine to give the answer.'

When children are ready, introduce the formal written method, where it is necessary to 'carry' ten from the units to the tens column:

$$\begin{array}{r} 58 \\ + 27 \\ \hline 85 \\ \underline{\quad} \\ 1 \end{array}$$

Use the language of place value to ensure understanding: 'Eight add seven equals 15. Write 5 in the units column and 'carry' one (10) over to the tens column. 50 add 20 and the ten previously 'carried' equals 80. Write 8 (80) in the tens column. The answer is 85.'

NB The 'carried' digit should be recorded under the line in the tens column.

When confident, calculations will involve bridging across the tens and the hundreds.

$$85 + 67 = 152$$

$$\begin{array}{r} 80 + 5 \\ + 60 + 7 \\ \hline 140 + 12 = 152 \end{array}$$

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

Next...

$$\begin{array}{r} 85 \\ + 67 \\ \hline 12 \quad (5 + 7) \\ \underline{140} \quad (80 + 60) \\ 152 \end{array}$$

'Add the least significant digits (units) together. Then add the tens together. Recombine to give the answer.'

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

$$85 + 67 = 152$$

$$\begin{array}{r} 85 \\ + 67 \\ \hline 152 \\ \small{1 \quad 1} \end{array}$$

Use the language of place value to ensure understanding: 'Five add seven equals 12. Write 2 in the units column and 'carry' one (10) over to the tens column. 80 add 60 and the ten previously 'carried' equals 150. Write 5 (50) in the tens column and carry one (100) over to the hundreds column. There is only the one (hundred) carried in the hundreds column, therefore write one above the line. The answer is 152.'

NB The 'carried' digits should be recorded under the line in the appropriate column.

When children are confident, extend with the addition of a three-digit number and a two-digit number:

$$166 + 47 = 213$$

$$\begin{array}{r} 166 \\ + 47 \\ \hline 213 \\ \small{1 \quad 1} \end{array}$$

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

### **Addition - Year Four**

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

- **Add numbers with up to four digits, using the formal written method of column addition (where appropriate)**

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:

$$156 + 198 = 354$$

$$\begin{array}{r} 156 \\ +198 \\ \hline 14 \text{ (6 + 8)} \\ 140 \text{ (50 + 90)} \\ \hline 200 \text{ (100 + 100)} \\ \hline 354 \end{array}$$

This will lead into the formal written method...

$$156 + 198 = 354$$

$$\begin{array}{r} 156 \\ +198 \\ \hline 354 \\ \hline 1 \quad 1 \end{array}$$

Use the language of place value to ensure understanding: 'Six add eight equals 14. Write 4 in the units column and 'carry' one (10) over to the tens column. 50 add 90 and the ten previously 'carried' equals 150. Write 5 (50) in the tens column and carry one (100) over to the hundreds column. 100 and 100 and the 100 previously carried equals 300. Write 3 (300) in the hundreds column. The answer is 354.'

The digits to be 'carried' must be recorded under the line in the correct column.

When children are confident, they should be introduced to the addition of a three-digit number to a four-digit number:

$$1868 + 637 = 2505$$

$$\begin{array}{r} 1868 \\ + 637 \\ \hline 2505 \\ \hline 1 \quad 1 \quad 1 \end{array}$$

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

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

## Addition – Year 5

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

- **Add whole numbers with more than four digits, including using the formal written method (column addition)**

**Statutory mental calculation expectations:**  
Add and subtract numbers mentally with increasingly large numbers.

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 decimals, and with the addition of three or more numbers:

$$22748 + 1645 = 24393$$

$$\begin{array}{r} 22748 \\ + 1645 \\ \hline 24393 \\ \small{1 \quad 1} \end{array}$$

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

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

$$\begin{array}{r} \text{£ } 126.35 \\ + \text{£ } 248.62 \\ \hline \text{£ } 374.97 \\ \small{1} \end{array}$$

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

\*\*Ensure the decimal points line up. In addition, ensure that the children are exposed to and using numbers with a different number of decimal places. This will ensure they have experience of lining up the decimal points and use zero as a place value holder.

Continue to practise and apply the formal written method throughout Year 5.

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

### Addition – Year 6

No objectives have been included in the Programmes of Study that are explicitly related to written methods for addition in Year 6. However, there is an expectation that 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.

Our aim is that by the end of Year 6, children will use mental methods when appropriate (with jottings, if it is fitting to do so). However, for calculations that cannot be worked out 'in their heads', children must use an efficient formal written method **accurately** and **confidently**.

### Mathematical vocabulary for addition Key Stage 2

add	addition	total	plus	sum
number bonds	make	altogether	double	near double
number line	more	total	How many more is...?	How much more is...than...?
How many more to make...?	one more	two more	ten more	hundred more
increase	score	...is the same as...	equals	sign
tens boundary	hundreds boundary	units boundary	tenths boundary	