

# ADDITION

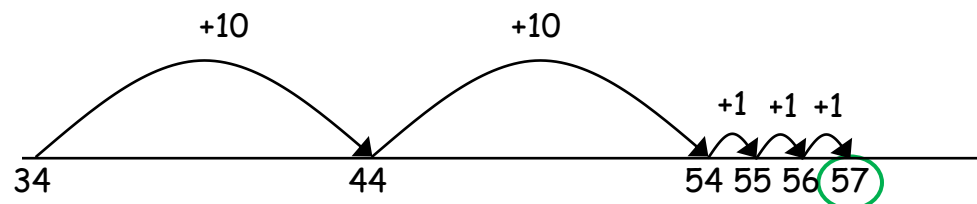
## YEAR 2

Add and subtract numbers (including two two-digit numbers) using concrete objects, pictorial representations, and mental methods.

Children will begin to use 'empty number lines' themselves starting with the larger number and counting on.

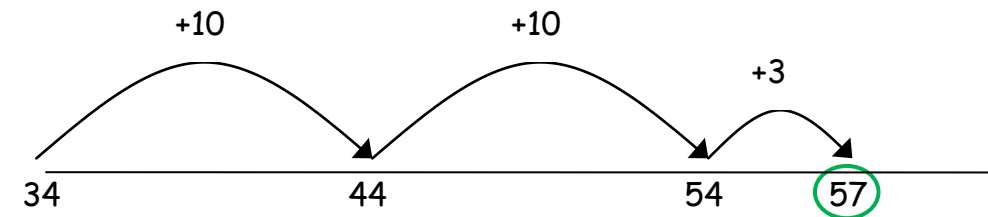
1. First counting on in tens and ones.  
- Always circle the answer.

$$34 + 23 = 57$$



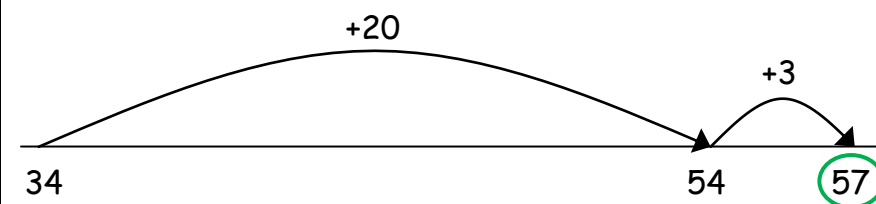
2. Then helping children to become more efficient by adding the ones in one jump (by using the known fact  $4 + 3 = 7$ ).

$$34 + 23 = 57$$



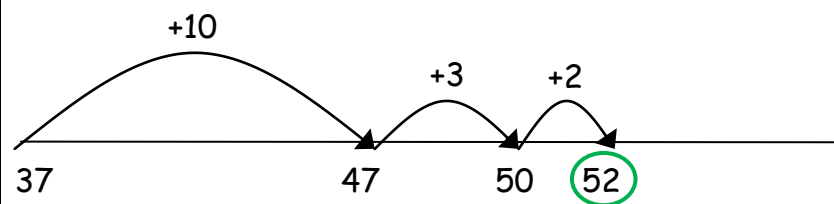
3. Followed by adding the tens in one jump and the ones in one jump.

$$34 + 23 = 57$$



4. Bridging through ten can help children become more efficient.

$$37 + 15 = 52$$



## YEAR 3

Add and subtract numbers with up to three digits, using formal written methods of column addition and subtraction.

Children will begin to use the informal expanded column addition method when adding two two-digit numbers.

1.  $52 + 34 = 86$

$$\begin{array}{r} 50 + 2 \\ + 30 + 4 \\ \hline 80 + 6 = 86 \end{array}$$

1. Partition (split into 10s and 1s) both numbers.
2. Add the 1s numbers.
3. Add the 10s numbers.
4. Recombine (put 10s and 1s back together) the answer.

2. Children will then begin to bridge and 'carry' 10s.

$36 + 47 = 83$

$$\begin{array}{r} 30 + 6 \\ + 40 + 7 \\ \hline 10 \\ \hline 80 + 3 = 83 \end{array}$$

1. Partition (split into 10s and 1s) both numbers.
2. Add the 1s numbers. If this is over 10 write the 1s digit in the 1s column and write the 10s number underneath the numbers in the 10s column.
3. Add the 10s numbers - remembering to add any extra 10s.
4. Recombine (put 10s and 1s back together) the answer.

Children will then use the informal expanded column addition method when adding two three-digit numbers.

1.  $121 + 234 = 355$

$$\begin{array}{r} 100 + 20 + 1 \\ + 200 + 30 + 4 \\ \hline 300 + 50 + 5 = 355 \end{array}$$

2.  $237 + 126 = 363$

$$\begin{array}{r} 200 + 30 + 7 \\ 100 + 20 + 6 \\ \hline 10 \\ \hline 300 + 60 + 3 = 363 \end{array}$$

3.  $346 + 278 = 624$

$$\begin{array}{r} 300 + 40 + 6 \\ 200 + 70 + 8 \\ \hline 100 \quad 10 \\ \hline 600 + 20 + 4 = 624 \end{array}$$

NB: When setting out, remind children to always leave a line before drawing the answer line.

## YEAR 4

Add numbers with up to 4 digits using the written methods of column addition where appropriate.

Children will begin to use the informal column addition method.

$$\begin{array}{r} 1. \quad 67 \\ + \quad 24 \\ \hline 11 \text{ ( } 7 + 4 \text{)} \\ \underline{80} \text{ (} 60 + 20 \text{)} \\ \underline{\quad 91} \end{array}$$

$$\begin{array}{r} 2. \quad 267 \\ + \quad 85 \\ \hline 12 \text{ ( } 7 + 5 \text{)} \\ 140 \text{ (} 60 + 80 \text{)} \\ \underline{200} \text{ (} 200 + 0 \text{)} \\ \underline{\quad 352} \end{array}$$

$$\begin{array}{r} 3. \quad 2345 \\ + \quad 353 \\ \hline 8 \text{ ( } 5 + 3 \text{)} \\ 90 \text{ ( } 40 + 50 \text{)} \\ 600 \text{ ( } 300 + 300 \text{)} \\ \underline{2000} \text{ (} 2000 + 0 \text{)} \\ \underline{\quad 2698} \end{array}$$

1. Write the numbers to be added with the digits in the correct place value columns.

2. Add the digits in the 1s column.

3. Add the digits in the 10s column.

*In example 1, you are adding 60 and 20 not 6 and 2*

*In example 2, you are adding 60 and 80 not 6 and 8. The 2 in the 100s column is 200.*

4. Starting with the most significant number, mentally add the mini totals to calculate the final answer.

By the end of Year 4 (or before if the teacher feels that the child is secure with this method) children will not need to write the information in the brackets.

$$\begin{array}{r} 59 \\ + \quad 34 \\ \hline 13 \\ \underline{80} \\ \underline{\quad 93} \end{array}$$

## YEAR 5

Add whole numbers with more than 4 digits, including using formal written methods.

They will practise adding decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places and complements of 1 eg,  $0.83 + 0.17 = 1$ .

Based on their experiences in Year 4, children will now begin to carry below the line. This is called the formal column addition method.

$$\begin{array}{r} 625 \\ + 48 \\ \hline 673 \\ \text{\scriptsize 1} \end{array}$$

$$\begin{array}{r} 367 \\ + 85 \\ \hline 452 \\ \text{\scriptsize 11} \end{array}$$

$$\begin{array}{r} 896 \\ + 597 \\ \hline 1493 \\ \text{\scriptsize 11} \end{array}$$

N.B: when teaching formal column addition, children should have a secure knowledge of place value. Therefore, the digits in each calculation should be treated as ones.

E.g, example 1:

$$5 + 8 = 13$$

$$2 \text{ (tens)} + 4 \text{ (tens)} + 1 \text{ (ten)} = 7 \text{ (tens)}$$

$$6 \text{ (hundreds)} + 0 = 6 \text{ (hundreds)}$$

The words in brackets do not need to be said.

1. Add the digits in the 1s column. If this is bigger than 10, you need to write the 1s digit in the 1s column and the 10s digit underneath the 10s column. Because it is 1 ten, then a 1 is recorded underneath.
2. Add the digits in the 10s column - make sure you add in any extra 10s. If this is bigger than 100, you need to write the 10s digit in the 10s column and the 100s digit underneath the 100s column.
3. Add the digits in the 100s column - make sure you add in any extra 100s.

By the end of Year 5, children should extend the formal addition method to numbers with at least four digits.

$$\begin{array}{r} 587 \\ + 475 \\ \hline 1062 \\ \text{\scriptsize 11} \end{array}$$

$$\begin{array}{r} 3587 \\ + 675 \\ \hline 4262 \\ \text{\scriptsize 111} \end{array}$$

$$\begin{array}{r} 8458 \\ + 3692 \\ \hline 12150 \\ \text{\scriptsize 111} \end{array}$$

Year 5 continued

When adding decimals, children will use the informal column addition method.

Informal column addition

$$\begin{array}{r} 358.76 \\ + 67.58 \\ \hline 0.14 \\ 1.20 \\ 15.00 \\ 110.00 \\ \hline 300.00 \\ \hline 426.34 \end{array}$$

1. Add the digits in the 0.01s (hundredths) column.
2. Add the digits in the 0.1s (tenths) column.
3. Add the digits in the 1s (ones) column.
4. Add the digits in the 10s (tens) column.
5. Add the digits in the 100s (hundreds) column.

When adding whole numbers and decimals, children will continue to use either the expanded or formal column addition method.

$$\begin{array}{r} 14 + 12.7 = \\ 14.0 \\ + 12.7 \\ \hline 26.7 \end{array}$$

NB: Good practice is to 'fill in' any gaps with 0s to ensure that the digits line up correctly.

## YEAR 6

Add whole numbers with more than 4 digits, including using formal written methods.

Children will practise adding decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places and complements of 1 eg,  $0.83 + 0.17 = 1$ .

When adding whole numbers, children will continue to use the formal column addition method.

$$\begin{array}{r} 36234 \\ + 7658 \\ \hline 43892 \\ \small{\begin{array}{cc} \uparrow & \uparrow \\ & \end{array}} \end{array}$$

When adding decimals, children will use the expanded column addition method moving onto the formal column addition method.

### Formal column addition

$$\begin{array}{r} 358.76 \\ + 67.58 \\ \hline 426.34 \\ \small{\begin{array}{cccc} \uparrow & \uparrow & \uparrow & \uparrow \end{array}} \end{array}$$

1. Add the hundredths column verbally explaining that you are adding 6 hundredths and 8 hundredths which is 14 hundredths (1 tenth and 4 hundredths) so we 'carry' the tenths digit.
2. Continue the addition using the correct place value vocabulary.