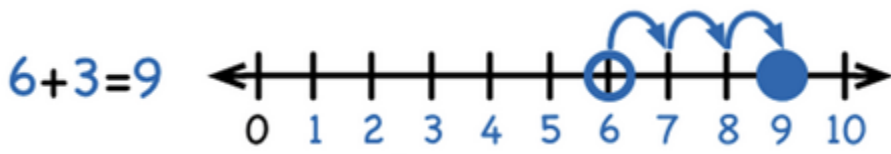


ADDITION

Stage 1 Add with numbers up to 20

Use numbered number lines to add, by counting on in ones. Encourage children to start with the **larger** number and count on e.g. $6 + 3 = 9$



Children should:

Have access to a wide range of counting equipment, everyday objects, number tracks and number lines, and be shown numbers in different contexts.

Read and write the addition (+) and equals (=) signs within number sentences.

Interpret addition number sentences and solve missing box problems, using concrete objects and number line addition to solve them:

$$8 + 3 = \square \quad 15 + 4 = \square \quad 5 + 3 + 1 = \square \quad \square + \square = 6$$

This builds on from prior learning of adding by combining two sets of objects into one group (5 cubes and 3 cubes) in Early Years.

Here is another example for $8 + 5 = 13$

Bead strings or bead bars can be used to illustrate addition including bridging through ten by counting on 2 then counting on 3.



Key vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line

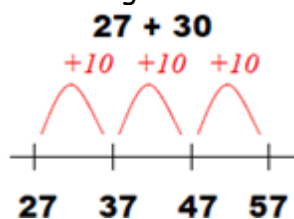
Key skills for addition at Stage 1:

- Read and write numbers to 100 in numerals, incl. 1-20 in words
- Recall bonds to 10 and 20, and addition facts within 20
- Count to and across 100
- Count in multiples of 1, 2, 5 and 10
- Solve simple 1-step problems involving addition, using objects, number lines and pictorial representations.

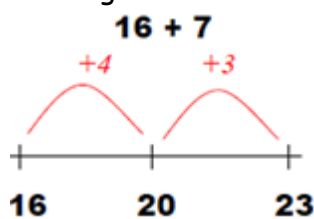
Stage 2 Add with 2-digit numbers

Developing mental fluency with addition and place value involving 2-digit numbers, then establish more formal methods.

Add 2-digit numbers and tens:

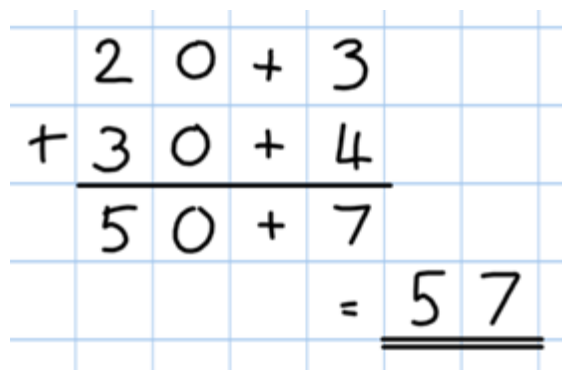
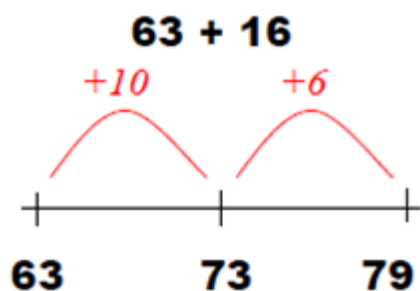


Add 2-digit numbers and units:



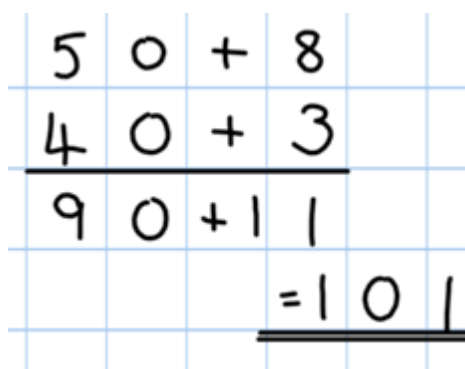
Use empty number lines, concrete equipment, hundred squares etc. to build confidence and fluency in mental addition skills.

Add pairs of 2-digit numbers, moving to the partitioned column method when secure adding tens and units:



STEP 1: Only provide examples that do **NOT** cross the tens boundary until they are secure with the method itself.

STEP 2: Once children can add a multiple of ten to a 2-digit number mentally (e.g. $80+11$), they are ready for adding pairs of 2-digit numbers that **DO** cross the tens boundary (e.g. $58 + 43$).



STEP 3: Children who are confident and accurate with this stage should move onto the expanded addition methods with 2 and 3-digit numbers (see Stage 3).

To support understanding, pupils may physically make and carry out the calculation with Dienes Base 10 apparatus or place value counters, then compare their practical version to the written form, to help them to build an understanding of it.

Key vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, **sum, tens, units, partition, addition, column, tens boundary**

Key skills for addition at Stage 2:

- Add a 2-digit number and ones (e.g. $27 + 6$)
- Add a 2-digit number and tens (e.g. $23 + 40$)
- Add pairs of 2-digit numbers (e.g. $35 + 47$)
- Add three single-digit numbers (e.g. $5 + 9 + 7$)
- Show that adding can be done in any order (the commutative law).
- Recall bonds to 20 and bonds of tens to 100 ($30 + 70$ etc.)
- Count in steps of 2, 3 and 5 and count in tens from any number.
- Understand the place value of 2-digit numbers (tens and ones)
- Compare and order numbers to 100 using $<$ $>$ and $=$ signs.
- Read and write numbers to at least 100 in numerals and words.
- Solve problems with addition, using concrete objects, pictorial representations, involving numbers, quantities and measures, and applying mental and written methods.

Stage 3 Add numbers with up to 3 digits

Introduce the **expanded column addition** method:

		2	3	6
	+		7	3
<hr/>				
				9
		1	0	0
		2	0	0
<hr/>				
		3	0	9

Add the **units** first, in preparation for the compact method.

In order to carry out this method of addition:

Children need to recognise the value of the hundreds, tens and units without recording the partitioning.

Move to the compact **column addition** method, with 'carrying':

236

Add units first

+ 73

"Carry" numbers underneath the bottom line

309

Remind children that the actual values are $30 + 70$, but we can say $3 + 7$ because the digits are already in the tens column

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Children who are very secure and confident with 3-digit expanded column addition should be moved onto the **compact column addition** method, being introduced to "carrying" for the first time. Compare the expanded method to the compact column method to develop an understanding of the process and the reduced number of steps involved.

Key vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, **hundreds boundary, increase, vertical, carry', expanded, compact**

Key skills for addition at Stage 3:

- Read and write numbers to 1000 in numerals and words.
- Add 2-digit numbers mentally, incl. those exceeding 100.
- **Add a three-digit number and ones mentally (175 + 8)**
- **Add a three-digit number and tens mentally (249 + 50)**
- **Add a three-digit number and hundreds mentally (381 + 400)**
- Estimate answers to calculations, using inverse to check answers.
- Solve problems, including missing number problems, using number facts, place value, and more complex addition.
- Recognise place value of each digit in 3-digit numbers (hundreds, tens, ones.)
- Continue to practise a wide range of mental addition strategies, ie. number bonds, adding the nearest multiple of 10, 100, 100 and adjusting, using near doubles, partitioning and recombining.

Stage 4 Add numbers with up to 4 digits

Move from expanded addition to the compact column method, **adding units first**, and "carrying" numbers **underneath** the calculation. Also include money and measures contexts.

Introduce the **compact column addition** method by asking children to add the two given numbers together using the method that they are familiar with (expanded column addition - see Stage 3). Teacher models the compact method with carrying, asking children to discuss similarities and differences and establish how it is carried out.

Add **units** first.

'Carry' numbers **underneath** the bottom

Reinforce correct place value by reminding them the actual value is 5 hundreds add 3 hundreds, **not 5 add 3, for example**

	3	5	1	7
+		3	9	6
	3	9	1	3

Use and apply this method to money and measurement values.

Key vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, vertical, „carry“, expanded, compact, **thousands, hundreds, digits, inverse**

Key skills for addition at Stage 4:

- Select most appropriate method: mental, jottings or written and explain why.
- Recognise the place value of each digit in a four-digit number.
- Round any number to the nearest 10, 100 or 1000.
- Estimate and use inverse operations to check answers.
- Solve 2-step problems in context, deciding which operations and methods to use and why.
- Find 1000 more or less than a given number.
- Continue to practise a wide range of mental addition strategies, ie. number bonds, add the nearest multiple of 10, 100, 1000 and adjust, use near doubles, partitioning and recombining.
- Add numbers with up to 4 digits using the formal written method of column addition
- Solve 2-step problems in contexts, deciding which operations and methods to use and why.
- Estimate and use inverse operations to check answers to a calculation.

Stage 5 Add numbers with more than 4 digits

Include money, measures and decimals with different numbers of decimal places.

The decimal point should be aligned in the same way as other place value columns, and must be in the same column in the answer.

Numbers should exceed 4 digits.

Pupils should be able to add **more than two values**, carefully aligning place value columns.

Children should understand the place value of tenths and hundredths and use this to align numbers with different numbers of decimal places.

£	2	3	.	5	9
+	£	7	.	5	5
<hr/>					
£	3	1	.	1	4

	2	3	,	4	8	1
+		1	3	6	2	
<hr/>						
	2	4	8	4	3	

1	9	.	0	1
	3	.	6	5
+	0	.	7	0
<hr/>				
2	3	.	3	6

Say '6 tenths add 7 tenths' to reinforce place value
 Empty decimal places could be filled with zero to show the place value in each column

Key vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, 'carry', expanded, compact, vertical, thousands, hundreds, digits, inverse & **decimal places, decimal point, tenths, hundredths, thousandths**

Key skills for addition at Stage 5:

- Add numbers mentally with increasingly large numbers, using and practising a range of mental strategies ie. add the nearest multiple of 10, 100, 100 and adjust; use near doubles, inverse, partitioning and re-combining; using number bonds.
- Use rounding to check answers and accuracy.
- Solve multi-step problems in contexts, deciding which operations and methods to use and why.
- Read, write, order and compare numbers to at least 1 million and determine the value of each digit.
- Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.
- Add numbers with more than 4 digits using formal written method of columnar addition.

Stage 6 Add several numbers of increasing complexity

Adding several numbers with different numbers of decimal places (including money and measures) and adding several numbers with more than 4 digits

Tenths, hundredths and thousandths should be correctly aligned, with the decimal point lined up vertically including in the answer row.

Zeros could be added into any empty decimal places, to show there is no value to add.

	2	3	.	3	6	1
		9	.	0	8	0
	5	9	.	7	7	0
+		1	.	3	0	0
<hr/>						
	9	3	.	5	1	1
	2	1		2		

	8	1	,	0	5	9
			3	6	6	8
			1	5	3	0
+			2	0	5	5
<hr/>						
	1	2	0	5	7	9
	1	1	1	1		

Key vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, 'carry', expanded, compact, vertical, thousands, hundreds, digits, inverse, decimal places, decimal point, tenths, hundredths, thousandths

Key skills for addition at Stage 6:

- Perform mental calculations, including with mixed operations and large numbers, using and practising a range of mental strategies.
- Solve multi-step problems in context, deciding which operations and methods to use and why.
- Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
- Read, write, order and compare numbers up to 10 million and determine the value of each digit.
- Round any whole number to a required degree of accuracy.
- Pupils understand how to add mentally with larger numbers and calculations of increasing complexity.