

# ADDITION

## Key Objective

Add one-digit and two-digit numbers to 20, including zero

## Key Vocabulary

Add, addition, count on, more than, total, altogether, how many, double, plus, make, equal to, equals, most, number line

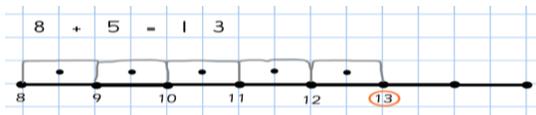
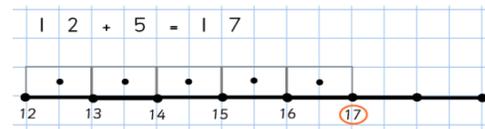
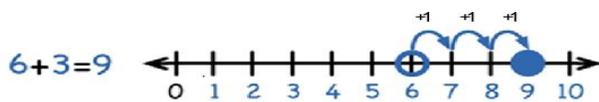
Using concrete objects to add numbers e.g.  $10 + 5 = 15$ , then move on to drawing circles.

1



2

Using numbered number lines to add numbers e.g.  $6 + 3 = 9$ . The same method is used to add a single digit to a 2digit



### Addition Objectives at Year 1:

- ♣ read and write numbers from 1 to 20 in numerals and words
- ♣ read and write numbers from 1 to 100 in numerals
- ♣ represent and use number bonds within 20
- ♣ solve one-step addition problems using concrete objects and pictorial representations, and missing number problems such as  $9 = 7 + \underline{\quad}$

# Year 1

# ADDITION

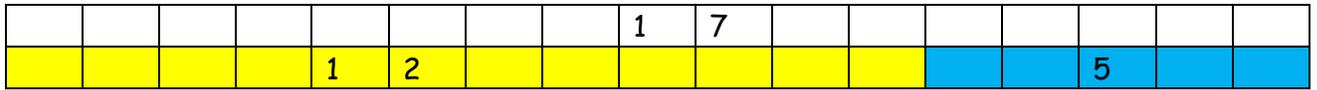
## Key Objective

Add numbers using concrete objects, pictorial representations, and mentally, including: a 2-digit number and ones, and two 2-digit numbers

## Key Vocabulary

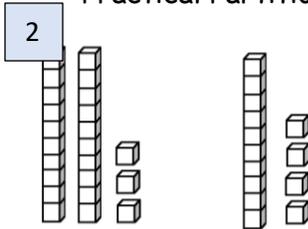
Add, addition, count on, more than, total, altogether, how many, double, plus, make, equal to, equals, most, number line

1 Using the bar model e.g.  $12 + 5$

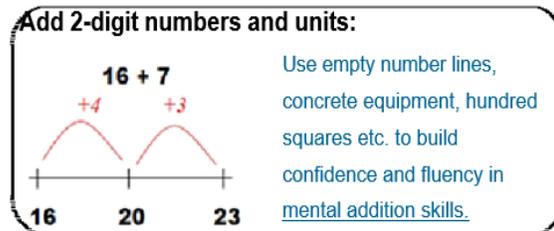
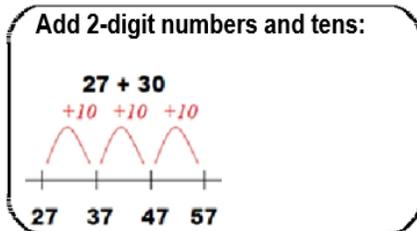


Practical Partitioning

Drawing Partitioning



4 Using empty number lines



5 Partitioned column method begin using numbers that do not cross the tens boundary.

T	O	+	T	O		
2	6	+	6	3	=	8 9
2	0	+	6	0	=	8 0
	6	+		3	=	9
8	0	+		9	=	8 9

6 Move on to numbers that do cross the tens boundary.

T	O	+	T	O		
3	7	+	4	5	=	8 2
3	0	+	4	0	=	7 0
	7	+		5	=	1 2
7	0	+	1	2	=	8 2

Short Partitioning method

2	6	+	3	9	=		
5	0	+	1	5	=	6	5

# Year 2

# ADDITION

## Key skills for addition at Y2:

- 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 ( $30+70$ )
- 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.

# ADDITION

## Key Objective

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

## 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**

### Introduce the expanded column addition method

Adding Tens and Ones

using brackets

	5	4		
+	2	3		
		7	(4 + 3)	
	7	0	(5 0 + 2 0)	
1	7	7		

Tens and Ones

No brackets

	8	6
+	3	7
		13
1	1	0
1	2	3

2

	2	3	6
+		7	3
			9
	1	0	0
	2	0	0
	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.
- Pupils need to be able to add in columns.

	2	8	6
+	3	4	8
		1	4
	1	2	0
	5	0	0
3	6	3	4

Adding Hundreds, Tens and Ones

4

### Move on to Compact Column addition method

Add Ones first

Carry numbers Under the bottom line

	2	1	6
+	1	5	3
			9
	3	6	9

5

Carrying

	3	5	6
+	1	2	7
			3
	4	8	3

Cross out once used!

# Year 3

# ADDITION

## Key skills for addition at Y3:

- 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, i.e. number bonds, adding the nearest multiple of 10, 100, 100 and adjusting, using near doubles, partitioning and recombining.

# ADDITION

## Key Objective

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

## 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**

## Compact Column Method

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

e.g.  $3517 + 396 = 3913$

1

	3	5	1	7
+		3	9	6
<hr/>				
	3	9	1	3
		1		
		1		

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 Y3). 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 line.

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

2

		1	4	5	6
+		2	5	9	4
<hr/>					
		4	0	5	0
		+	+	+	

Adding Thousands, Hundreds, Tens and Ones

# Year 4

# ADDITION

## Key skills for addition at Y4:

- 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, i.e. 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.

# ADDITION

## Key Objective

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

## 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**

## Compact Column Method

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

$$\begin{array}{r} \text{£} 23.59 \\ + \text{£} 7.55 \\ \hline \text{£} 31.14 \end{array}$$

1

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

2

	5	2	4	5	6
Add place holder	+	0	7	2	8
	5	9	7	3	9

$$\begin{array}{r} 23481 \\ + 1362 \\ \hline 24843 \end{array}$$

3

	1	9	4	5	6
+	2	5	5	9	4
	4	5	0	5	0

## Adding numbers 5 digit

4

$$\begin{array}{r} 19.01 \\ 3.65 \\ + 0.70 \\ \hline 23.36 \end{array}$$

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

Say '6 tenths add 7 tenths' to reinforce place value.

Empty decimal places can be filled with zero to show the place value in each column.

# Year 5

# ADDITION

## Key skills for addition at Y5:

- Add numbers mentally with increasingly large numbers, using and practising a range of mental strategies i.e. 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.

# ADDITION

## Key Objective

Add several numbers of increasing complexity

## 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

### Compact Column Method

1

	7	8	9	6	8	4
+		6	5	5	3	9
<hr/>						
	8	5	5	2	2	3
<hr/>						
		/	/	/	/	/

2

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

Add place holder

3

	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		

Adding several numbers with different numbers of decimal places (including money and measures):

- 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.

Empty decimal places can be filled with zero to show the place value in each column.

# Year 6

# ADDITION

## Key skills for addition at Y6:

- 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.