

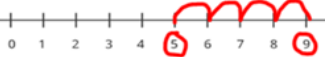
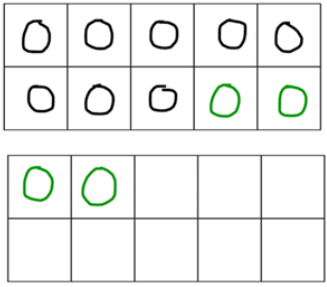
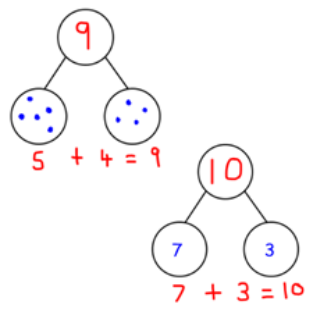


Calculation & Fluency Policy – Progression in Addition

Last updated: 10th February 2022

This document outlines the progression in addition strategies throughout our academies. Teaching staff should consider using previously taught written methods as part of visually representing mental methods later in a child's school journey. For example, using a number line (taught as a written method in much of KS1) as a way to visually represent mental methods in Key Stage 2.

It has been carefully put together in line with the National Curriculum (2014), the Government's non-statutory guidance for teaching mathematics (June 2020) and our existing approach to teaching mathematics. This document has been organised respective of age-related expectations and learning should still be differentiated appropriately.

Year 1	In Year 1 , pupils need to be able to write and interpret expressions and equations to represent aggregation (putting parts together to make a whole) and augmentation (increasing a quantity by adding more).				
	Pupils should also learn to relate addition contexts and equations to mathematical diagrams such as bar models, number lines, tens frames with counters, and partitioning diagrams.				
		Bar model	Number line for counting single jumps	Tens frames	Part-whole model
Picture examples	Aggregation How many altogether?  $5 + 3 = 8$	 $6 + 2 = 8$	$5 + 4 = 9$ 	$8 + 4 = 12$ 	
		Lesson videos			
					

Year 2

In Year 2, pupils will at first use manipulatives, such as tens frames, to understand the strategies for adding across 10. However, they should later be able to carry out these calculations mentally, using their fluency in complements to 10 and partitioning. Pupils are fluent in these calculations when they no longer rely on extensive written methods.

When adding within 100, pupils should be able to add multiples of 10 mentally, using their known addition facts. They should be able to demonstrate their reasoning either verbally or with manipulatives or drawings.

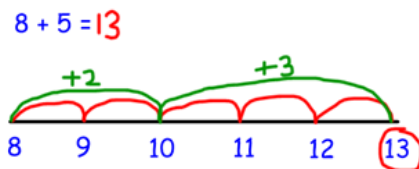
The semi-formal methods are used to help pupils learn how to record the steps for adding 2 digit numbers that are not multiples of 10 using informal written notation.

Pupils do not need to learn formal written methods for addition in Year 2, but column addition may be touched on as part of finding the total of addends in the semi-formal method.

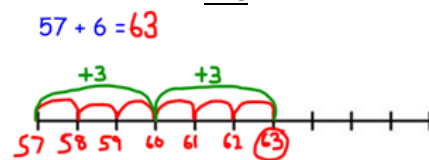
Picture examples

Number line addition

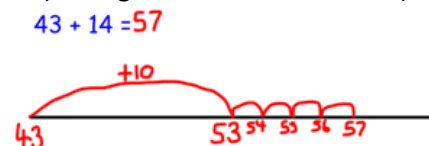
Bridging 10 (initially with single jumps but moving towards doing the green jumps mentally)



As above but with a blank number line



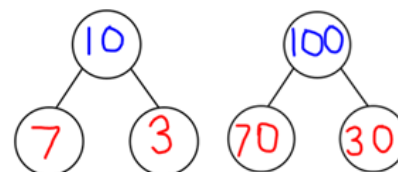
Adding teen numbers by partitioning
(adding the ten and then ones)



Using known facts – It's Nothing New!

Using complements to 10 to know complements to 100

$$\begin{array}{|c|c|c|c|c|} \hline 7 & + & 3 & = & 10 \\ \hline 70 & + & 30 & = & 100 \\ \hline \end{array}$$

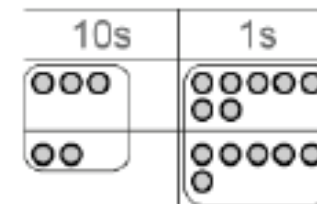


Our 'Fluent in Five' approach includes revisits of this from Spring 2 onwards

Fluent in Five – Year 2			
	Spring 2	Summer 1	Summer 2
Year 2	<i>It's Nothing New</i> (Link back to Y1)	<i>It's Nothing New</i> (Link back to Y1)	<i>It's Nothing New</i> (Link back to Y1)
	10 + 10	60 + 60	10 + 90
	20 + 20	70 + 70	20 + 80
	30 + 30	80 + 80	30 + 70
	40 + 40	90 + 90	40 + 60
	50 + 50	100 + 100	

Semi-formal written methods

Using visuals to deepen understanding of partitioning



Semi-formal method
(always adding the tens first)

$$\begin{array}{|c|c|c|c|c|c|} \hline 2 & 6 & + & 3 & 7 & = & 6 & 3 \\ \hline 2 & 6 & + & 3 & 0 & = & 5 & 6 \\ \hline 5 & 6 & + & & 7 & = & 6 & 3 \\ \hline \end{array}$$

Lesson videos



Year 3	In Year 3, pupils first consolidate their strategies from Year 2, particularly the semi-formal method. However, this is then built upon as pupils should be able to add up to three-digit numbers using the formal written method of column addition. This should include calculations with more than two addends, and calculations with addends that have different numbers of digits.	Picture examples	<u>Semi-formal method</u> $\begin{array}{r} 26 + 37 = 63 \\ 26 + 30 = 56 \\ 56 + 7 = 63 \end{array}$	<u>Column addition</u> $\begin{array}{r} 274 \\ + 354 \\ \hline 628 \\ 1 \end{array}$	<u>Addends that have different amounts of digits</u> $\begin{array}{r} 62 \\ + 481 \\ \hline 543 \\ 1 \end{array}$	<u>Calculating with more than 2 addends</u> $\begin{array}{r} 186 \\ 57 \\ + 434 \\ \hline 677 \\ 1 \end{array}$
	For calculations with more than 2 addends, pupils should add the digits within a column in the most efficient order. This could include: - using number compliments to make 10 - using knowledge of doubles first	Lesson videos				

Year 4	In Year 4, pupils should extend column addition methods up to four-digit numbers. This should include calculations with more than two addends, and calculations with addends that have different numbers of digits.	Picture examples	<u>Column addition</u> $\begin{array}{r} 6584 \\ + 2739 \\ \hline 9323 \\ 1 \end{array}$	<u>Addends that have different amounts of digits</u> $\begin{array}{r} 3362 \\ + 649 \\ \hline 4011 \\ 1 \end{array}$	<u>Calculating with more than 2 addends</u> $\begin{array}{r} 1649 \\ 3104 \\ + 516 \\ \hline 5269 \\ 1 \end{array}$
	For calculations with more than 2 addends, pupils should add the digits within a column in the most efficient order. This could include: - using number compliments to make 10 - using knowledge of doubles first Commas should be used in number sentences for numbers with more than 3 digits; however, they should <u>not</u> be used as part of the method itself. When calculating time (start time, end time and duration), our policy is to do so using a number line.	Lesson videos			

Year 5	In Year 5, pupils should extend column addition methods up to five-digit numbers. This should include calculations with more than two addends, and calculations with addends that have different numbers of digits. In addition, pupils should be able to add numbers with up to 2 decimal places. <i>For calculations with more than 2 addends, pupils should add the digits within a column in the most efficient order. This could include:</i> - using number compliments to make 10 - using knowledge of doubles first <i>Commas should be used in the number sentence for numbers with more than 3 digits; however, they should <u>not</u> be used as part of the method itself.</i> <i>When calculating time (start time, end time and duration), our policy is to do so using a number line.</i>	Picture examples	<u>Column addition</u> $\begin{array}{r} 47329 \\ + 35631 \\ \hline 82960 \end{array}$	<u>Addends that have different amounts of digits</u> $\begin{array}{r} 31804 \\ + 7526 \\ \hline 39330 \end{array}$	<u>Calculating with more than 2 addends</u> $\begin{array}{r} 65003 \\ 782 \\ + 56 \\ \hline 65841 \end{array}$	<u>Adding decimals up to 2dp</u> $\begin{array}{r} 24.36 \\ + 32.45 \\ \hline 56.81 \end{array}$	<u>Adding decimals using placeholders</u> $\begin{array}{r} 47.52 \\ + 81.70 \\ \hline 129.22 \end{array}$
		Lesson videos					

Year 6	In Year 6, pupils should extend column addition methods up to six-digit numbers, as well as those with up to 2 decimal places. This should include calculations with more than two addends, and calculations with addends that have different numbers of digits. In addition, pupils should be able to add numbers with up to 2 decimal places, including those with more than 2 addends. <i>For calculations with more than 2 addends, pupils should add the digits within a column in the most efficient order. This could include:</i> - using number compliments to make 10 - using knowledge of doubles first	Picture examples	<u>Column addition</u> $\begin{array}{r} 378658 \\ + 513472 \\ \hline 892130 \end{array}$	<u>Addends that have different amounts of digits</u> $\begin{array}{r} 974732 \\ + 82662 \\ \hline 1057394 \end{array}$	<u>Calculating with more than two addends</u> $\begin{array}{r} 537238 \\ 2540 \\ + 30777 \\ \hline 570555 \end{array}$	<u>Adding decimals up to 2dp</u> $\begin{array}{r} 6.85 \\ + 34.23 \\ \hline 41.08 \end{array}$	<u>Adding decimals using placeholders</u> $\begin{array}{r} 28.00 \\ + 7.45 \\ \hline 35.45 \end{array}$
		Lesson videos					

