LANE END CALCULATION POLICY

ADDITION

We follow a Concrete Pictorial Abstract approach to mathematical learning and children work through each stage before moving on to more formal written methods. Models, images and resources are selected carefully to best teach concepts and structures. We recognise that all children work through this approach.

Addition is taught as augmentation (increasing a measure or quantity by another quantity) using "First…..then…….now" stories. Link mathematical stories to numerical representation (each number represents something in the story).

Addition is also taught as aggregation (combining two quantities to make a total).

Year 1

Skill: Add 1-digit numbers within 10

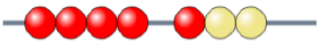
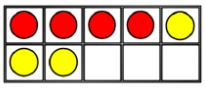
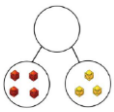
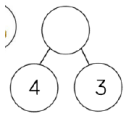
Children will first add by using objects and **counting all of the objects**. Next they will start with the **largest number and count on.** When the children are more secure with recognising the numicon shapes they will start to use these pieces to **represent numbers** and add.



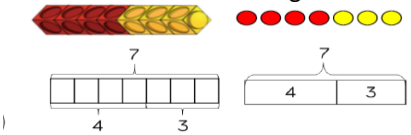




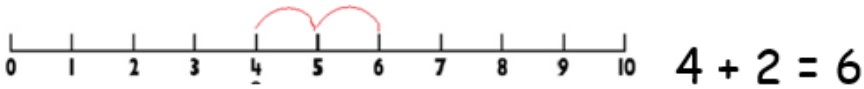
Next children will explore other representations (starting with numicon) when adding – bead strings, tens frames and part whole models.

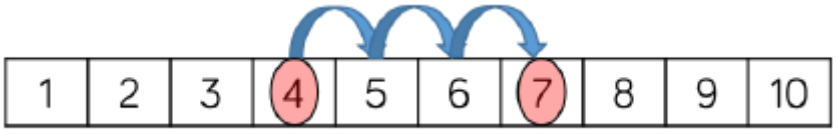





After this they will use cubes and counters - look at them alongside bar models (see below):



Next children will use numbered number lines and number tracks to count on in ones.

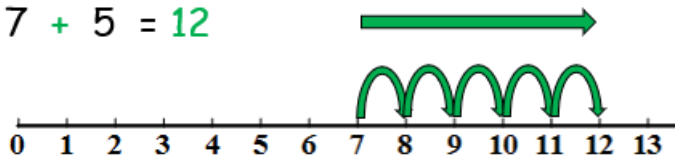




Year 1/2

Skill: Add 1 and 2-digit numbers to 20

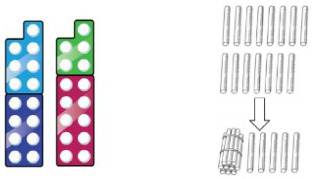
Initially the children will use number lines and number tracks to count on in ones from the biggest number.

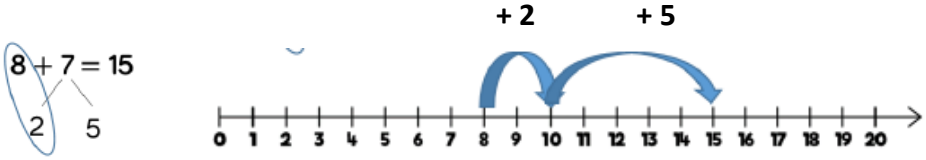


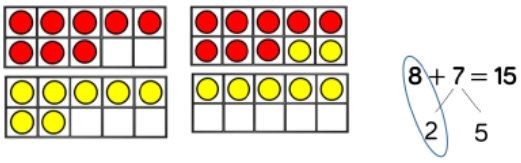
Children need to have worked on gaining a more secure knowledge of number bonds within 10 to support this learning.

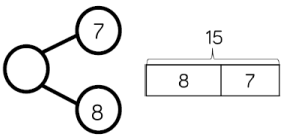
When adding one-digit numbers that cross ten, it is important to highlight ten ones equalling one ten. Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps.

The aim is for the children to partition a number and add each part (using multiple of 10 to bridge to) rather than adding in ones. This may take some children longer to grasp depending on number bond knowledge.







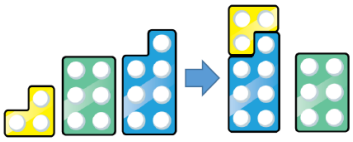


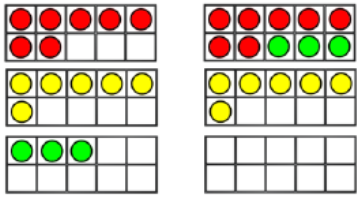
Year 2

Skill: Add three 1-digit numbers

When adding three 1-digit numbers children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.
This supports children's understanding of commutativity.
Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

$7 + 6 + 3 = 16$





$7 + 6 + 3 = 16$

10

Year 2/3

Skill: Add 1-digit and 2-digit numbers to 100

When adding single digits to a 2-digit number children should be encouraged to start with the largest number.

They should also apply their knowledge of number bonds to add more efficiently, e.g. 8 + 5 = 13 so we know that 38 + 5 = 43.

Hundred squares and straws can support children to find the number bond to 10.

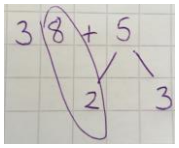
Numbered number lines

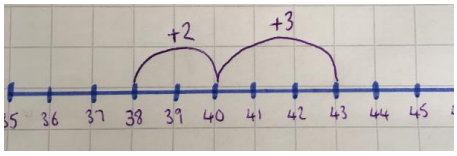
Children start by counting in ones to add.

$38 + 5 = 43$

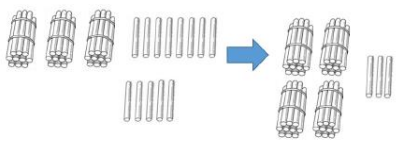


Then they move to partitioning the number they are adding as exemplified:



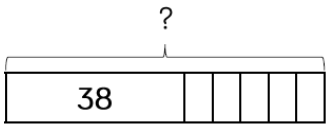


Concrete resources and representations to use alongside the number lines:



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

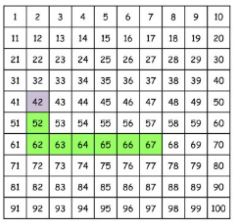
This is how we might represent this calculation using a bar model:



Year 2/3

Skill: Add two 2-digit numbers to 100

100 squares can be used to show adding tens and then ones but the aim is for children to move quickly to blank number lines alongside concrete resources.

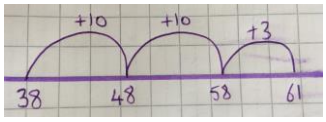


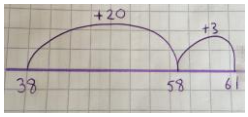
42 + 25 = 67

Children use **blank number lines** to count on to find a total.

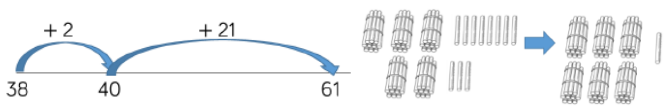
Children who are less confident with number bonds may choose to count on like this:

$$38 + 23 = 61$$



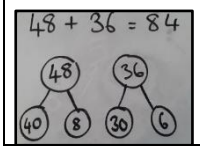


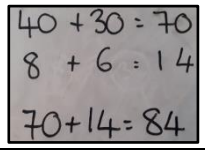
Encourage them to jump to multiples of 10 to be more efficient.



As before we use concrete resources such as straws or Base 10 alongside until secure.

Children should also be taught how to **partition numbers** and set it out as follows:



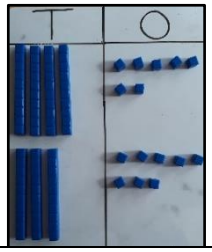
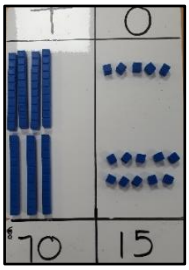
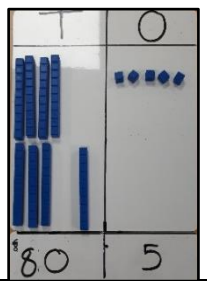


At this stage we encourage the children to use the formal column method when calculating alongside straws, Base 10 or Place Value counters.

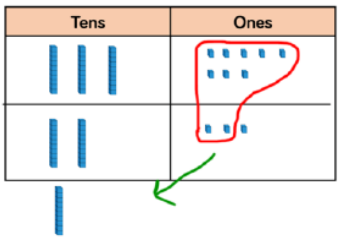
As numbers become larger though straws become less efficient.
Children begin by using Base 10 and Place Value counters, they then represent pictorially and after this they move on to the column method. Always start with NOT crossing 10 and then go on to cross ten and make an exchange.

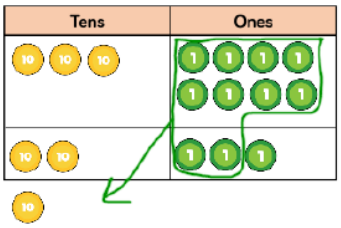
<u>Expanded Column Method</u>

The expanded column method leads children on to the compact column method. It should be taught using Base 10 apparatus and it is important that children can do this practically before they start to record their method. e.g. 47 + 38 = 85

	T Ones 40 7 + 30 8	Children should partition both numbers and create these numbers using base ten. They should then set them out on a place diagram mat as shown in the photo.
	T Ones 40 7 + 30 8 70 15	Children should group all the ones together and all the tens together.
	T Ones 40 7 + 30 8 70 ~~15~~ 5 1	Children then physically compare ten ones to one ten and exchange the ten ones for the ten. Carry the newly formed ten into the tens column and remove the ones.
	T Ones 40 7 + 30 8 80 5 ~~1~~	Children should then count up how many tens and how many ones they have. They can then recombine them to attain their answer. The sum of 47 and 38 is 85

Children should be encouraged to use a range/experience a range of representations to understand expanded column method.





$$\begin{array}{r} 38 \\ +\ 23 \\ \hline 61 \\ \hline 1 \end{array}$$

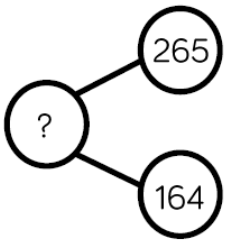
Year: 3

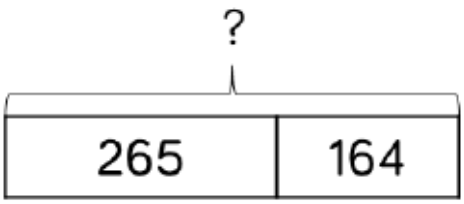
Skill: Add numbers with up to 3 digits

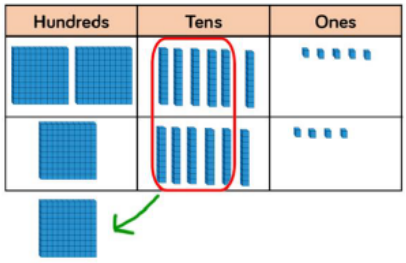
Base 10 and Place Value counters are the most effective manipulatives when adding numbers with up to 3 digits.

Ensure children write their calculation out alongside any concrete resources so they can see the links to the written column method.

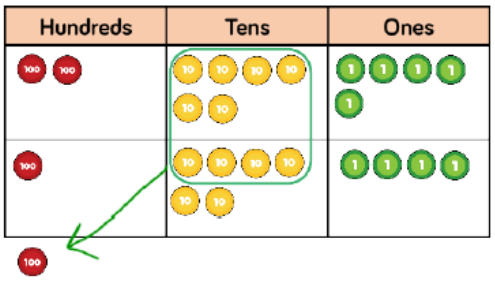
$$265 + 164 = 429$$







$$\begin{array}{r} 265 \\ +\ 164 \\ \hline 429 \\ \hline 1 \end{array}$$

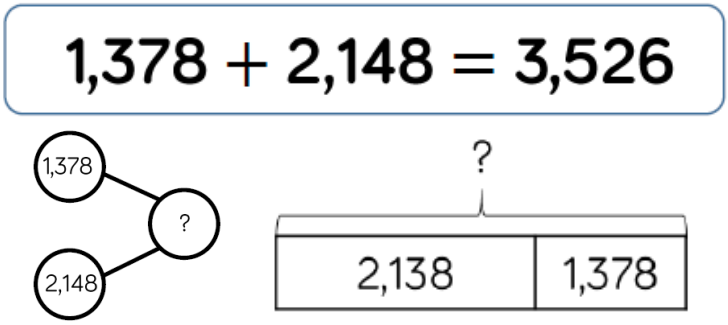


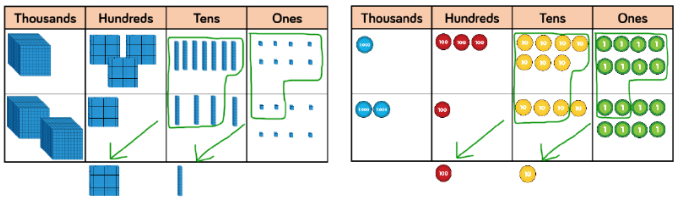
Year: 4

Skill: Add numbers with up to 4 digits

Base 10 and Place Value counters are the most effective manipulatives when adding numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.





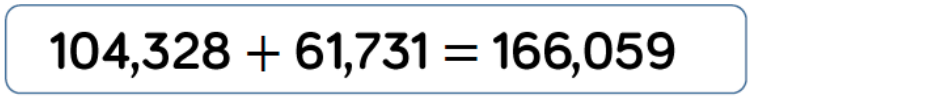
	1	3	7	8
+	2	1	4	8
	3	5	2	6
		1	1	

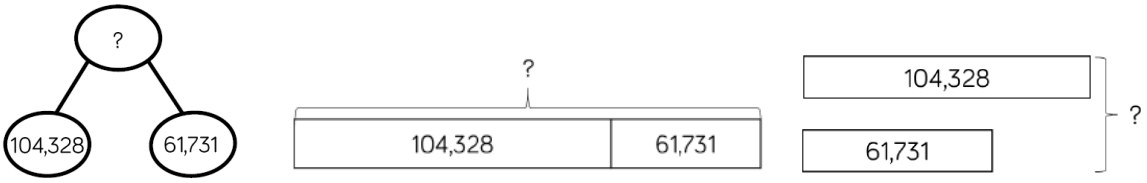
Year: 5/6

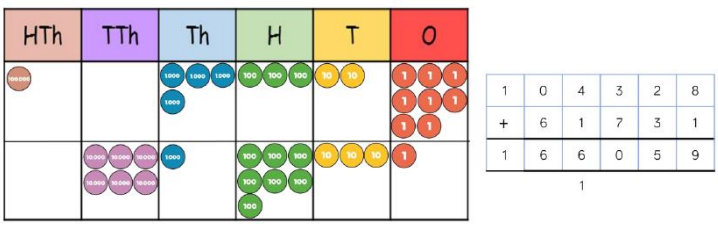
Skill: Add numbers with more than 4 digits

Place value counters or plain counters are the most effective concrete resources when adding numbers with more than 4 digits.

At this stage children should be encouraged to work in the abstract, using the column method to add numbers more efficiently.







1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9
			1		

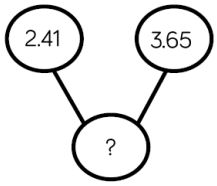
Year: 5/6

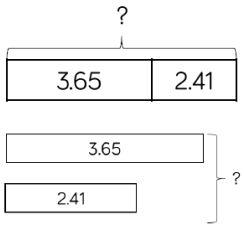
Skill: Add with up to 3 decimal places

Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.

$$3.65 + 2.41 = 6.06$$





$$\begin{array}{r} 3.65 \\ +\ 2.41 \\ \hline 6.06 \\ \hline 1 \end{array}$$

