Calculation Policy

Year 1 to Year 6

Addition

Introduction

Weddington Primary School uses the White Rose schemes of work as a planning guidance to teach a mastery approach from Reception to Year 6.

Therefore, Weddington Primary School has used the White Rose Calculation policy as a guidance to show the progression of addition skills taught from Year 1 to Year 6 at Weddington.

- There is a separate document that gives an overview of the different models and images (the concrete manipulatives and pictorial images that can support the teaching of the different concepts in the different operations). White Rose provides the explanation of the benefits of using the models and shows links between the different operations.
- First, there is a Key vocabulary all staff should be familiar with. as White Rose uses this language in their schemes of work.
- Next, an overview of the progression of the addition skills from Year 1 to Year 6.
- Then, a progression of addition skills linked to year groups to encourage and support consistency throughout the school. Each skill shows different models and images that could be used to effectively teach that concept.

Key vocabulary - All staff should be familiar with.

Addend - A number to be added to another.

Aggregation - combining two or more quantities or measures to find a total.

Augmentation - increasing a quantity or measure by another quantity.

Commutative – numbers can be added in any order.

Complement – in addition, a number and its complement make a total e.g. 300 is the complement to 700 to make 1,000

Difference – the numerical difference between two numbers is found by comparing the quantity in each group.

Exchange – Change a number or expression for another of an equal value.

Minuend – A quantity or number from which another is subtracted.

Partitioning – Splitting a number into its component parts.

Reduction – Subtraction as take away.

Subitise – Instantly recognise the number of objects in a small group without needing to count.

Subtrahend - A number to be subtracted from another.

Sum - The result of an addition.

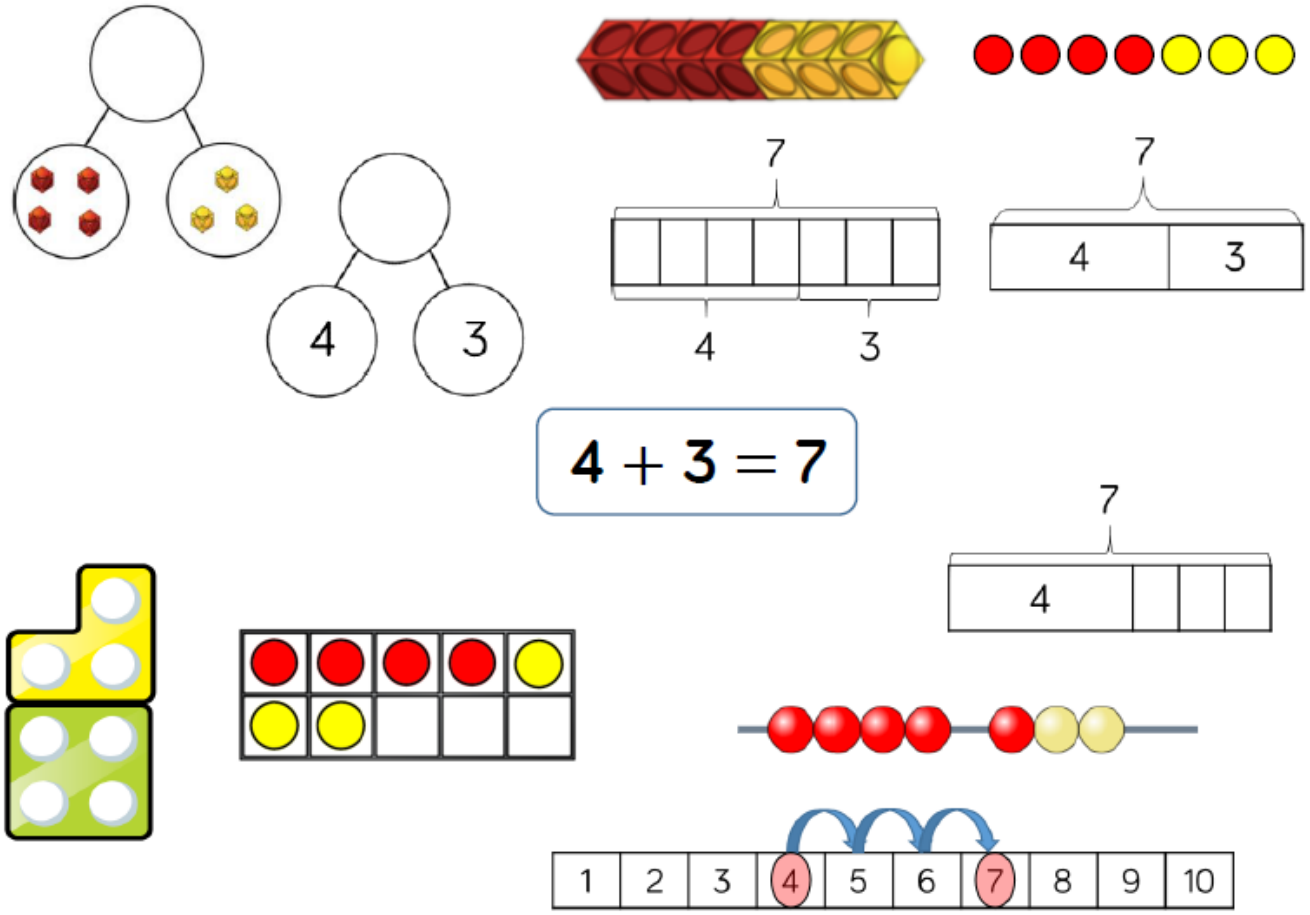
Total – The aggregate or the sum found by addition.

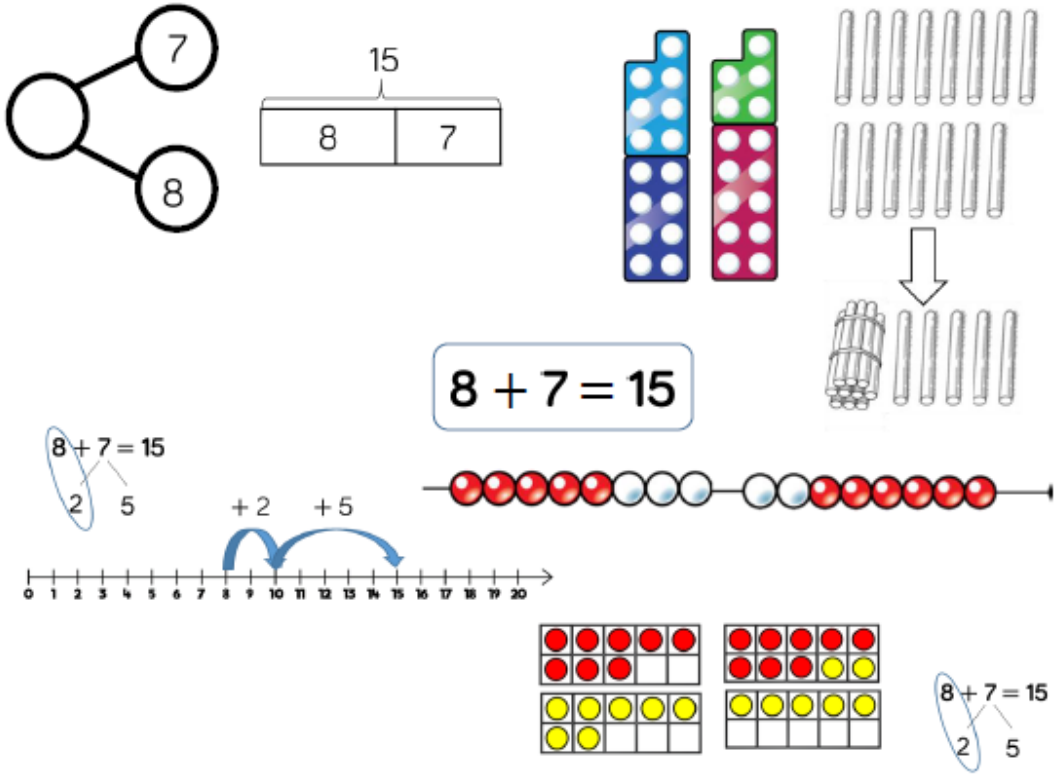
An Overview of Addition Skills

(from Year 1 to Year 6.)

Skill	Year	Representations and models	
Add two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Add 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead strings (20) Number tracks Number lines (labelled) Straws
Add three 1-digit numbers	2	Part-whole model Bar model	Ten frames (within 20) Number shapes
Add 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square

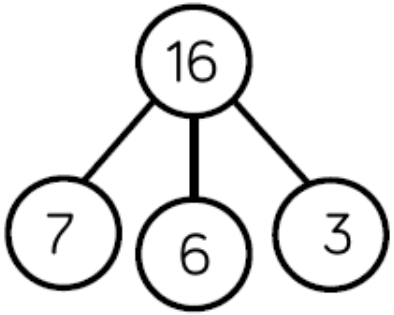
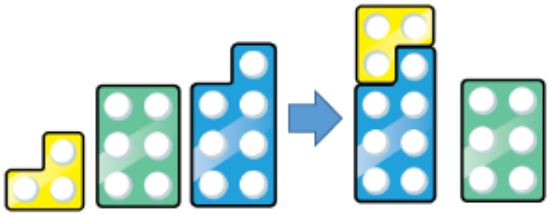
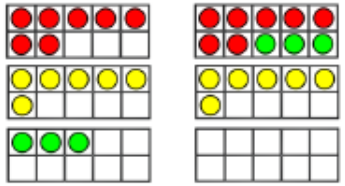
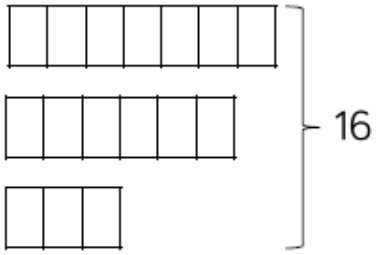
Skill	Year	Representations and models	
Add two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters
Add with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with more than 4 digits	5	Part-whole model Bar model	Place value counters Column addition
Add with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column addition

Skill: Add 1-digit numbers within 10	Year: 1
	When adding numbers to 10, children can explore both aggregation and augmentation. The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation. The combination bar model, ten frame, bead string and number track all support augmentation.

Skill: Add 1 and 2-digit numbers to 20	Year: 1/2
	When adding one-digit numbers that cross 10, it is important to highlight the importance of 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.

Year 1 / 2

Using a variety of manipulatives and different representations is essential for the children's learning and understanding.

Skill: Add three 1-digit numbers	Year: 2
  $7 + 6 + 3 = 16$  $7 + 6 + 3 = 16$ 10 	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 in their understanding of commutativity. Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

Year 2

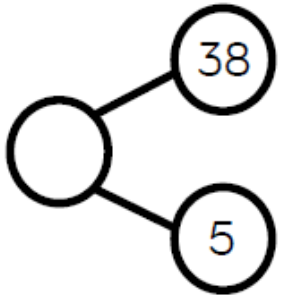
Using a variety of manipulatives and different representations is essential for the children's learning.

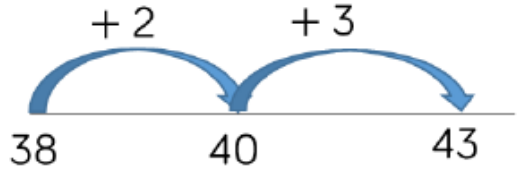
Aggregation - combining two or more quantities or measure to find a total

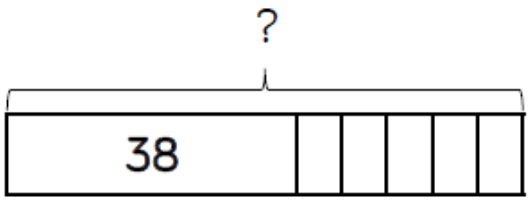
Augmentation - increasing a quantity or measure by another quantity.

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

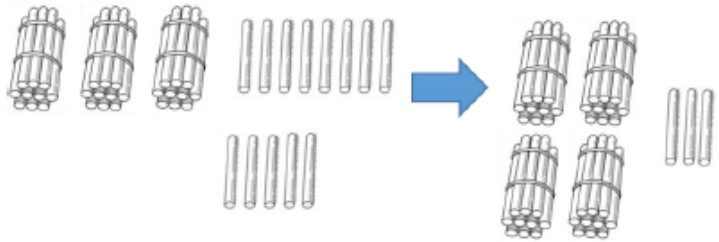
Year: 2/3







38 + 5 = 43



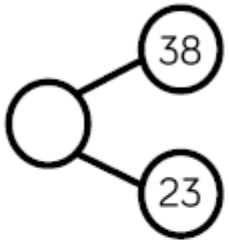
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

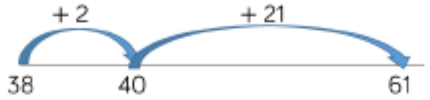
When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

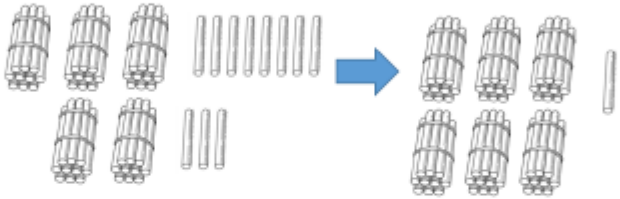
They should also apply their knowledge of number bonds to add more efficiently e.g. 8 + 5 = 13 so 38 + 5 = 43.

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

Skill: Add two 2-digit numbers to 100



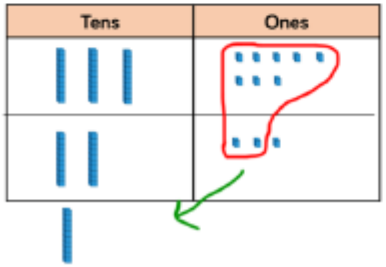




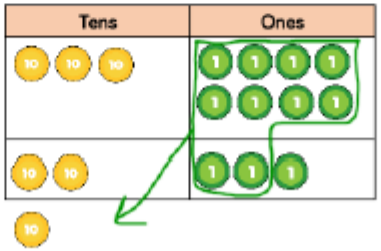
?

38	23

38 + 23 = 61



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



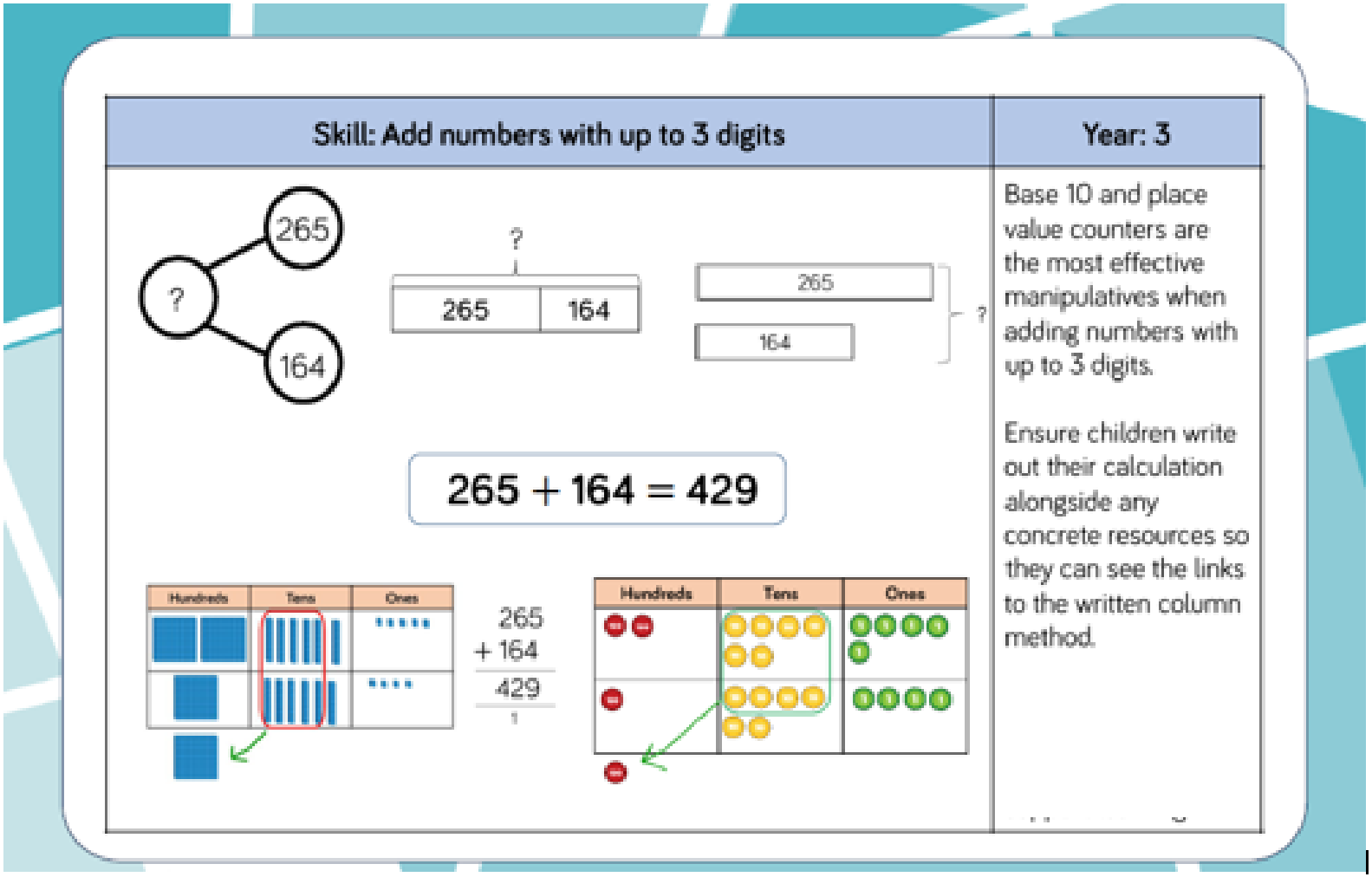
Year: 2/3

At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

Children can also use a blank number line to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.

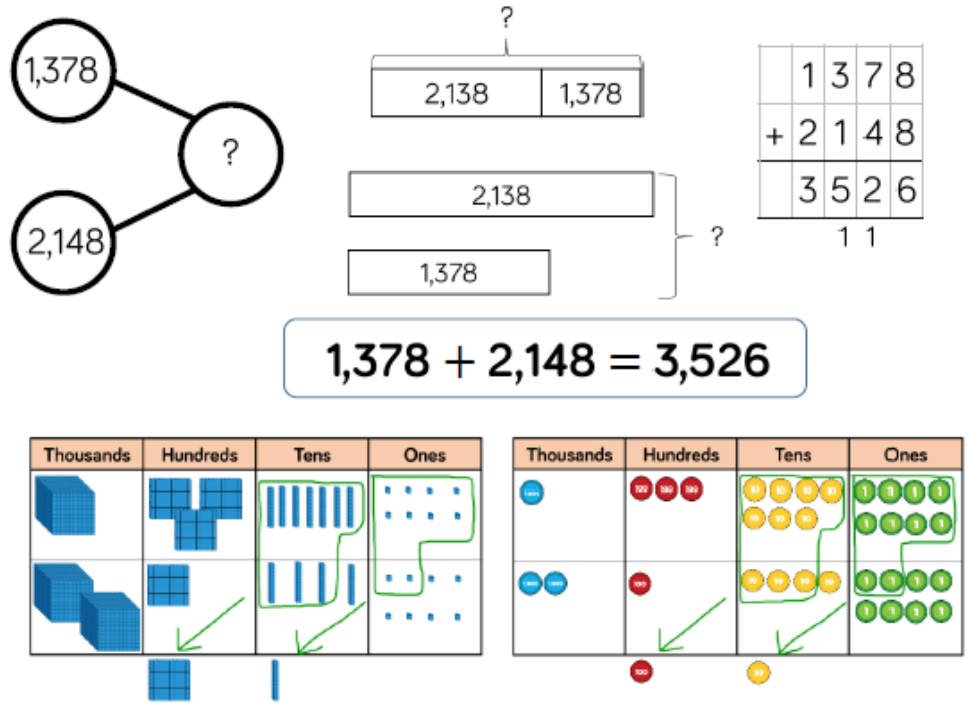
In Year 2, allow the children time to use the Base 10 to create 2 - digit numbers and vary the representation of adding 2- digit numbers to 100.

Using a variety of manipulatives and different representations is essential for the children's learning and understanding.



In Year 3, allow the children time to use the Base 10 and place value counters to create the three-digit numbers and adding three digit numbers.

In Weddington, when using the formal method for addition the children are encouraged to use headings and tick the ones column.

Skill: Add numbers with up to 4 digits	Year: 4
	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. Plain counters on a place value grid can also be used to support learning.

In Year 4, place value counters are the main manipulative for the children to use supported by a variety of other concrete resources.

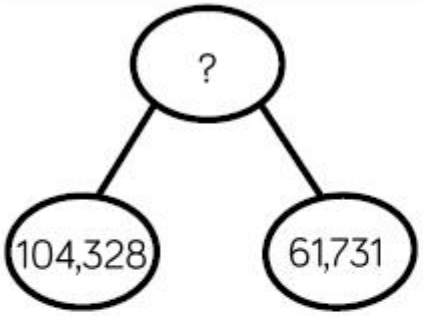
In Weddington, when using the formal method for addition the children are encouraged to use headings and tick the ones column.

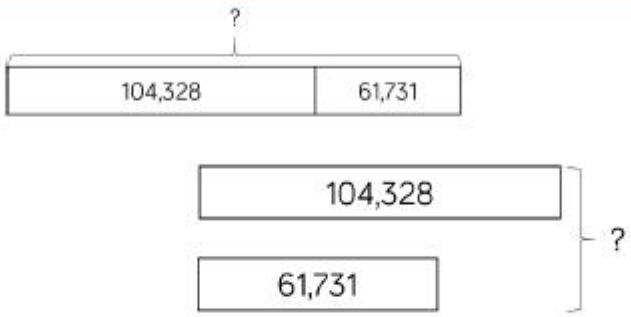
The children use a comma when writing 4-digit numbers and above.

	H	T	O
	2	6	5
+	1	6	4
	4	2	9
	1		

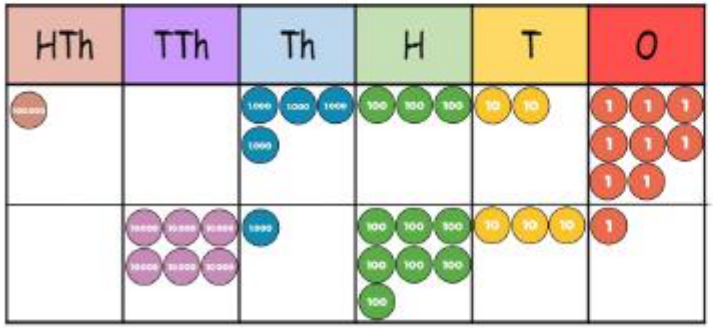
Skill: Add numbers with more than 4 digits

Year: 5/6





104,328 + 61,731 = 166,059



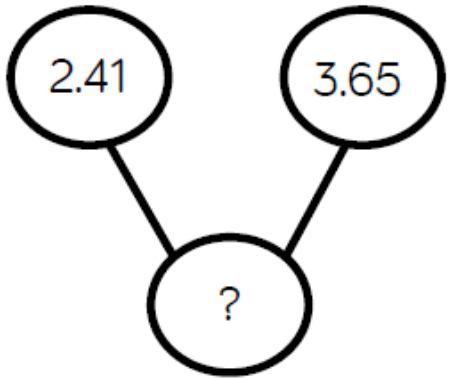
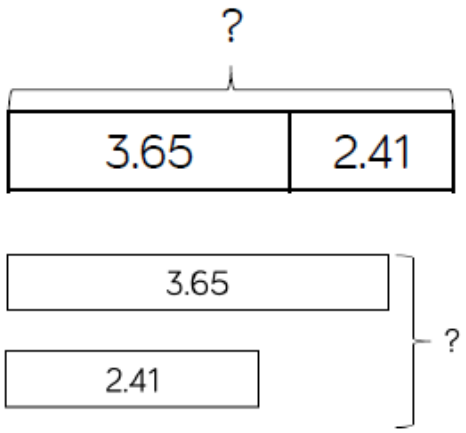
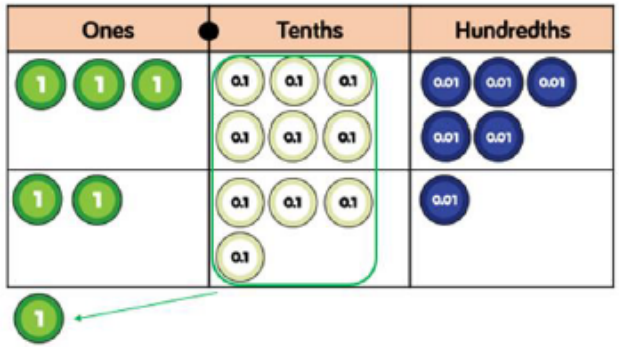
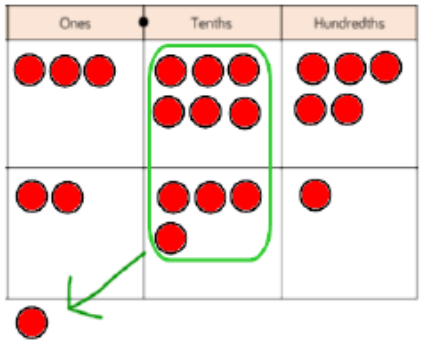
1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9
			1		

Place value counters or plain counters on a place value grid 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 larger numbers efficiently.

In year 5 and 6, the teacher will assess the needs of the children and those children who still need the headings to add formally will use them, while the other children will use the column method (with no headings) to add the larger numbers.

	Th	H	T	O
	1	3	7	8
+	3	5	2	6
	4,	9	0	4
		1	1	

Skill: Add with up to 3 decimal places	Year: 5
  3.65 + 2.41 6.06 1 **3.65 + 2.41 = 6.06**  	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.