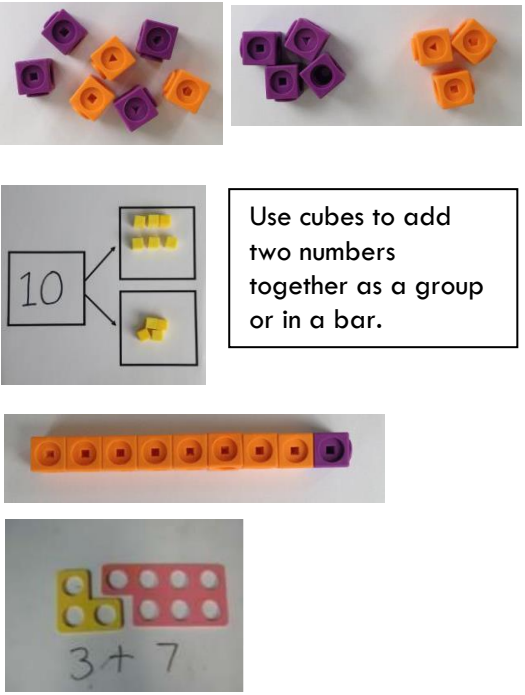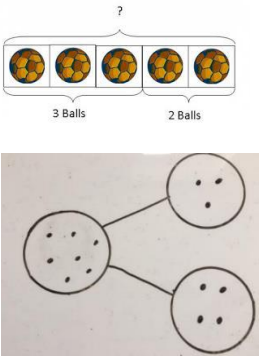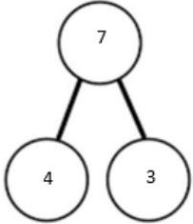# Coppice Valley Primary School
Calculation procedure

Addition
Key vocabulary: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as'

Objective and strategy	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part-whole model (aggregation) Suggested year group(s): R, Year 1	Use cubes to add two numbers together as a group or in a bar. Use other resources too e.g. eggs, shells, teddy bears, cars.	Use pictures to add two numbers together as a group or in a bar. 3 Balls 2 Balls	$4 + 3 = 7$ Addend + Addend = Sum $10 = 6 + 4$ Use the part-part whole diagram to move into the abstract.

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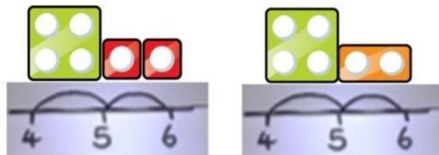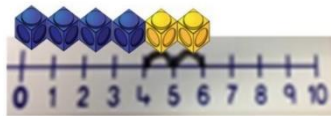
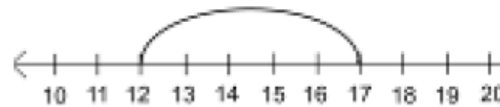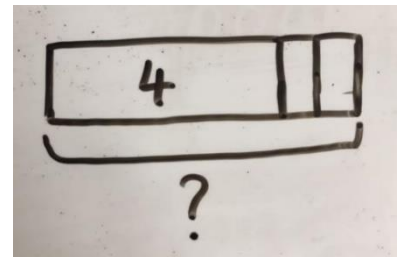|			
Starting at the larger number and counting on (augmentation) **Suggested year group(s): R, Year 1**	Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer. Use cubes and Numicon too.	$12 + 5 = 17$ Start at the larger number on the number line or hundred square and count on in ones or in one jump to find the answer. A bar model which encourages the children to count on, rather than count all.	$5 + 12 = 17$ *'Place the largest number in your head and count on the smaller number to find your answer.'* What is 5 more than 12? What is the sum of 12 and 5? What is the total of 5 and 12?

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Regrouping to make 10 Suggested year group(s): Year 1, Year 2	 $6 + 5 = 11$ 	 $3 + 9 =$ Use pictures or a number line. Regroup or partition the smaller number to make 10. 	$7 + 4 = 11$ *'If I am at seven, how many more do I need to make 10? How many more do I add on now?'* Children to develop an understanding of equality e.g. $6 + \square = 11$ $6 + 5 = 5 + \square$ $6 + 5 = \square + 4$
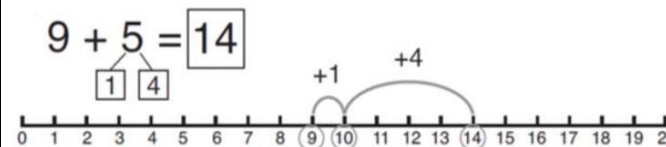
Start with the larger number and use the smaller number to make 10.

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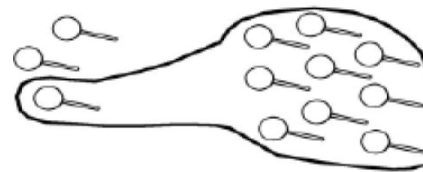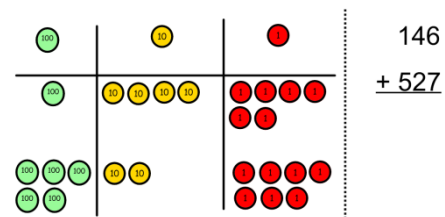|			
Adding three single digits N.B. Making 10 should be the primary strategy. Suggested year group(s): Year 2	4 + 7 + 6= 17 Put 4 and 6 together to make 10. Add on 7.	Add together three groups of objects. Draw a picture to recombine the groups to make 10.	$4 + 7 + 6 = \boxed{10} + \boxed{7}$ 10 $= \boxed{17}$ Combine the two numbers that make 10 and then add on the remainder.
Column method – no regrouping Suggested year group(s): Year 2, Year 3	24 + 15= Add together the ones first then add the tens. Use the Base 10 blocks first before moving onto place value counters. T | O	After practically using the base 10 blocks and place value counters, children can draw the counters or Base 10 e.g. lines of tens and dots or crosses for ones. T | O 10s | 1s IIII | . 4 | 9 21 + 34 = 55 Prove it using a mathematical diagram or concrete resource.	Calculations: (Year 3 upwards) 21 + 34 = 2 1 + 3 4 ■ = 21 + 34 Calculate the sum of twenty-one and thirty-four. Word Problems: In year 3, there are 21 children and in year 4, there are 34 children. How many children are there in total?

Addition

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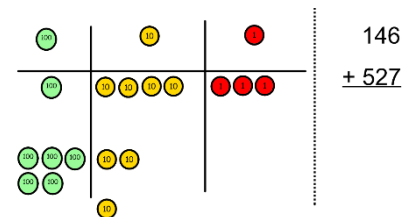
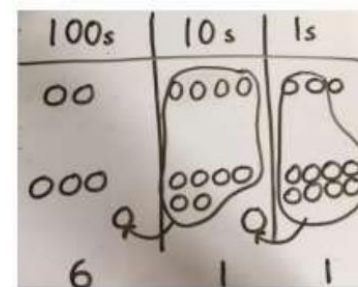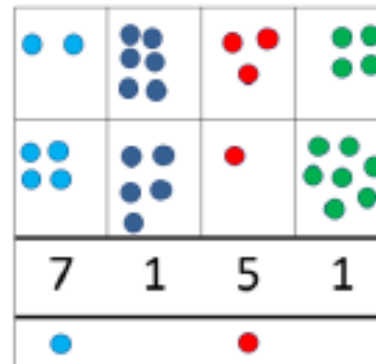|			
Column method – regrouping **Suggested year group(s): Year 2, Year 3, Year 4, Year 5, Year 6**	Make both numbers on a place value grid. 146 + 527 *Add up the ones and exchange 10 ones for one 10.* 146 + 527 Add up the rest of the columns, exchanging the 10 counters from one column for the next place value column until every column has been added. This can also be done with Base 10 to help children clearly see that 10 ones equal 1 ten and 10 tens equal 100. As children move on to decimals, money and decimal place value counters can be used to support learning	Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding. 7 1 5 1 A place value chart can be used to draw the counters, circling when they make an exchange.	**Year 3 upwards:** Start by partitioning the numbers before moving on to clearly show the exchange below the addition. 20 + 5 40 + 8 60 + 13 = 73 As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here. 536 + 85 621 1 1 72.8 + 54.6 127.4 1 1 £ 2 3 . 5 9 + £ 7 . 5 5 £ 3 1 . 1 4 1 1 1

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Conceptual variation; different ways to ask children to solve 21 + 34

?
21 | 34
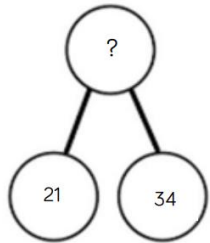
	?	
21		34

Word problems:
In year 3, there are 21 children and in year 4, there are 34 children. How many children in total?

21 + 34 = 55. Prove it
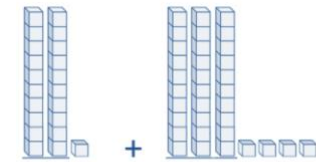
Calculate the sum of twenty-one and thirty-four.

$$21$$
$$+34$$
_____

$21 + 34 =$

☐ $= 21 + 34$

Missing digit problems:

10s	1s
10 10	1
10 10 10	?
?	5