Southbourne Infant School
Calculation Policy 2020 - Concrete, Pictorial and Abstract
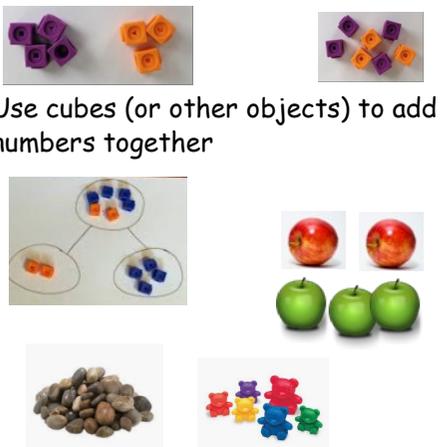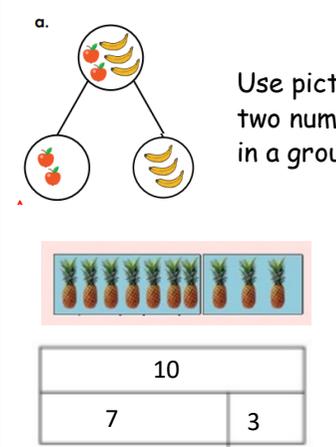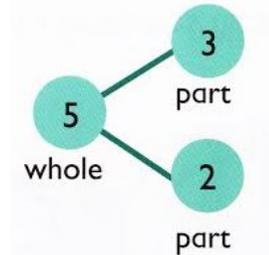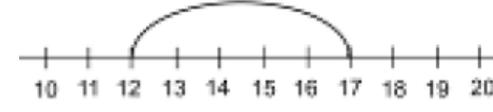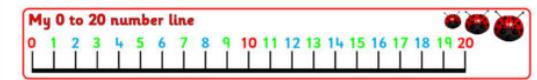
Concrete, Pictorial, Abstract (CPA) is a highly effective approach to teaching that develops a deep and sustainable understanding of maths in pupils.

- **Concrete** is the "doing stage, using concrete objects to model problems.

- **Pictorial** is the "seeing" stage, using representations of objects to model problems. This stage encourages children to make a mental connection between the physical object and abstract levels. This may include looking at pictures, drawing representations or diagrams.

- **Abstract** is the "symbolic" stage, where children are able to use abstract symbols to model problems. Children are introduced to mathematical symbols, for example +, -, x, ÷ to indicate addition, subtraction, multiplication and division.
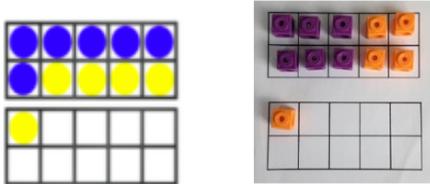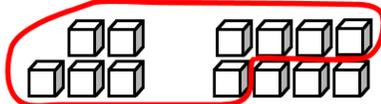
Calculation Policy—Addition

Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as', total, count on.

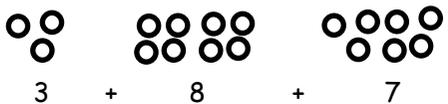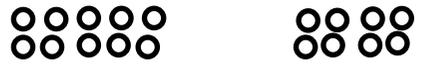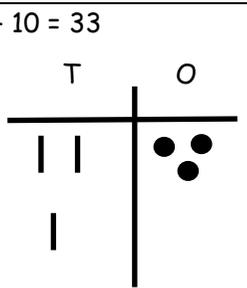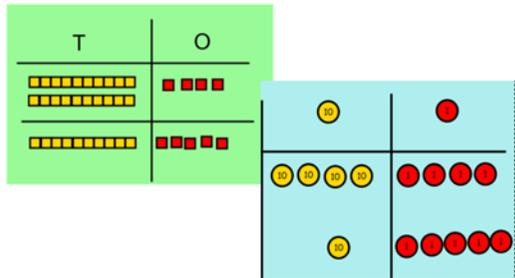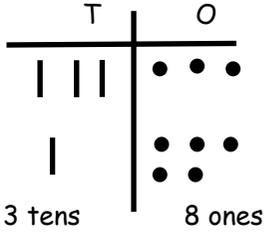|	Concrete	Pictorial	Abstract
Combining two parts to make a whole . Part-Part Whole	Use cubes (or other objects) to add two numbers together	**a.** Use pictures to add two numbers together in a group or in a bar. 10 / 7 / 3	Use a Part-Part Whole diagram to move into the abstract. 3 + 2 = 5 2 + 3 = 5 5 = 3 + 2 5 = 2 + 3
Starting at the bigger number and counting on.	12.....13, 14, 15, 16, 17. Start with the larger number and count on the small number. 4...5, 6.	I have 12 marbles. My friend gives me 5 more, how many marbles do I have? Start on 12 on a number line and count on 5 ones.	5 + 12 = 17 Place the larger number in your head and count on the smaller number to find your answer. Remember the larger number may not always be the first number

Calculation Policy—Addition

	Concrete	Pictorial	Abstract
Regrouping to make 10. *This is an essential skill for column addition later.*	Using a tens frame and counters/objects. Start with the bigger number and use the smaller number to make 10. 6 and 5	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? 7 + 3 + 1 = 11
Adding thee single digit numbers.	3 8 7 7 and 3 make 10. 10 and 8 make 18	3 + 8 + 7 10 + 8 = 18 Draw a picture to recombine the groups to make 10.	Combine the two numbers that make 10 and then add on the rest. 6 + 5 + 4 = 6 + 4 = 10 10 + 5 = 15

Adding a 2 digit number and a ten or multiple of ten.	23 + 10 = 33
	
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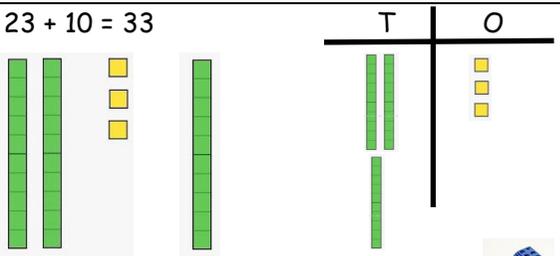	
	Use dienes (tens and ones) or Numicon
		23 + 10 = 33
		
		T O
		
		Children draw tens and ones grid and then draw sticks and dots to represent the tens and ones.
			23 + 10 = 23 I know that 10 more than 23 is 33.
			
			Introduction of the column method.
			
			    2 3
			+ 1 0
			    3 3

Calculation Policy—Addition
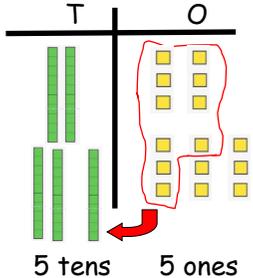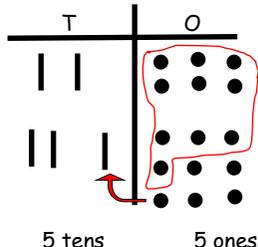
	Concrete	Pictorial	Abstract
Adding two digit numbers— no regrouping	Add together the ones first then add the tens. Use dienes first before moving onto place value counters 24 + 15 = 38	Draw tens and ones grid and then draw sticks and dots to represent the tens and ones. Add the ones and then the tens. T | O 3 tens 8 ones 23 + 15 = 38	23 and 15 = 38 I know that 3 and 5 is 8, and 20 and 10 is 30. 30 + 8 = 38 　　　2　3 +　　1　5 　　　3　8
Adding two digit numbers— with regrouping	Use ten dienes, spotting the 'Sneaky ten'. Swap tens ones for a tens stick. 26 + 29 = 55 T　O 5 tens 5 ones	Draw a tens and ones grid, draw the sticks and dots to represent tens and ones. Spot the 'Sneaky Ten' and swap tens ones for a ten stick. 26 + 29 = 55 T　O 5 tens 5 ones	Column method. 　　　2　6 +　　2　9 　　　5　5 　　　　1 Add the ones. One ten to carry over to the tens column. Add the tens, including the carry over.