Addition Progression

Step 1: To understand the cardinal value of number words, for example understanding that 'four' relates to 4 objects. Subitise for up to 5 items and begin to understand the concept of 'more' e.g. when counting forwards understand the 'one more' relationship.

Task 1 – Subitising

Question 1a

Show 3 fingers on one hand.

'Can you say how many fingers I am holding up/showing?'

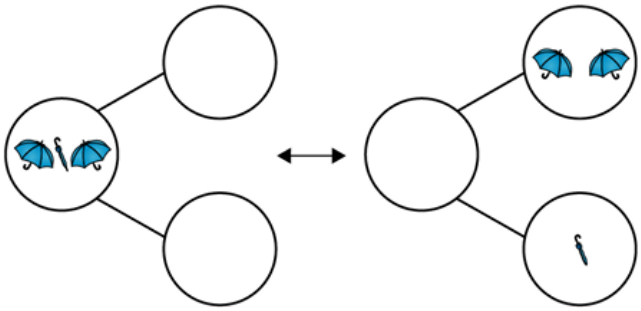
Question 1b

Show 4 cubes in a random arrangement on the table.

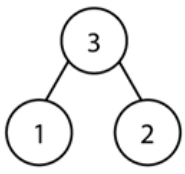
'Can you say how many cubes there are without counting?'

Step 2: To know that a whole group of objects can be composed of 2 or more parts with the use of a part-part-whole diagram. Pupils to be confident that the parts can be split in different ways and look different but that these combine to make a whole. This can begin with images and move on to numeral representation.

Part–part–whole cherry representation with pictures:

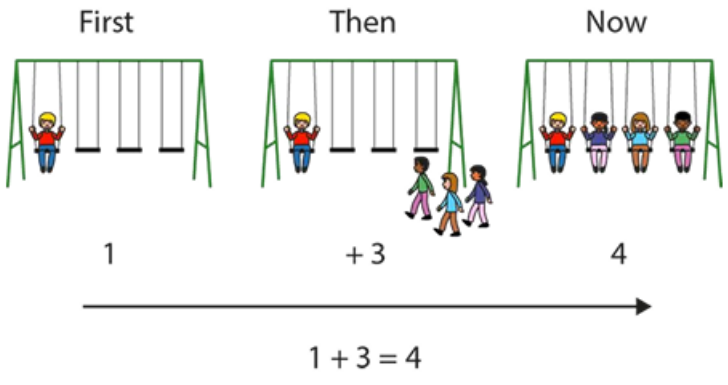


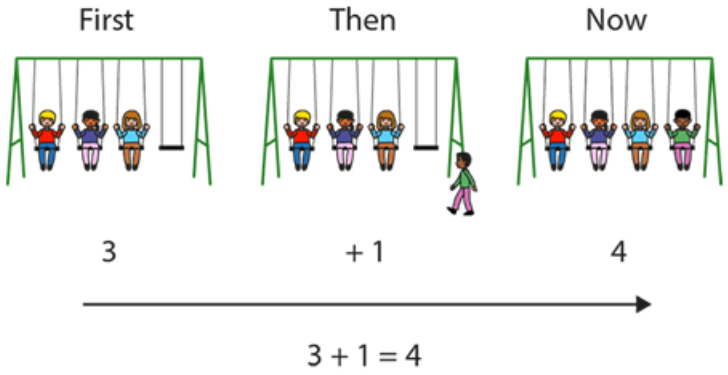
Part–part–whole cherry representation with numerals:



- *'The 3 represents the whole group of umbrellas.'*
- *'The 1 represents the closed umbrellas.'*
- *'The 2 represents the open umbrellas.'*

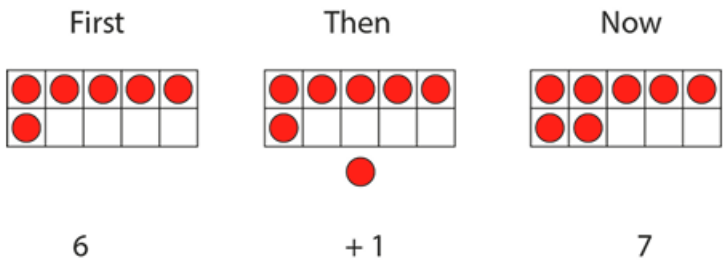
Step 3: Use of first, then, now and to recognise that adding is commutative so when the order of the addends is changed, the sum remains the same. Use of pictures.



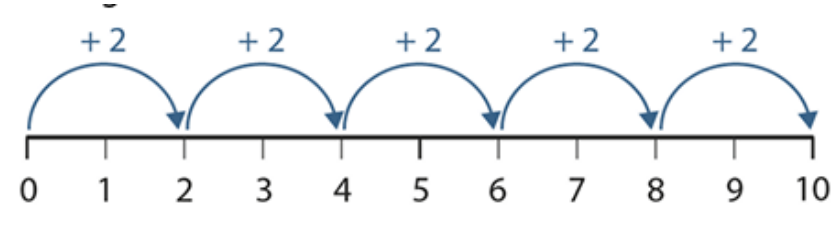


$1 + 3 = 3 + 1$

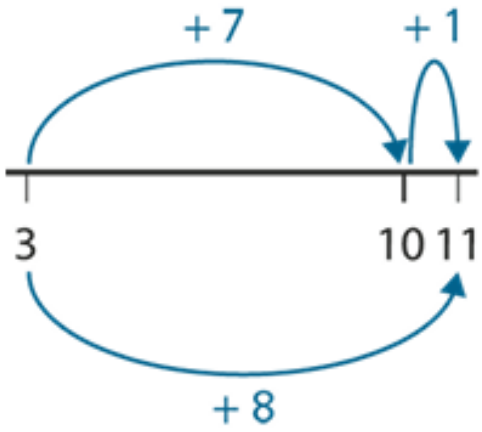
'One plus three is equal to three plus one.'

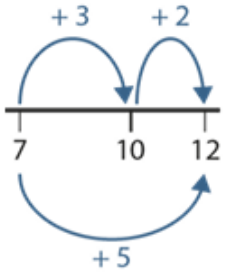


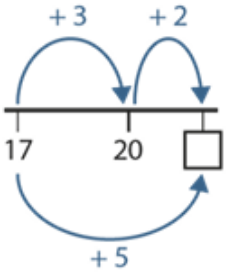
Step 4: Use of numberlines to show addition and patterns.

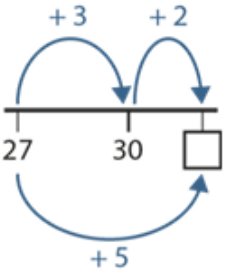


Step 5: Use of bridging to a multiple of ten.





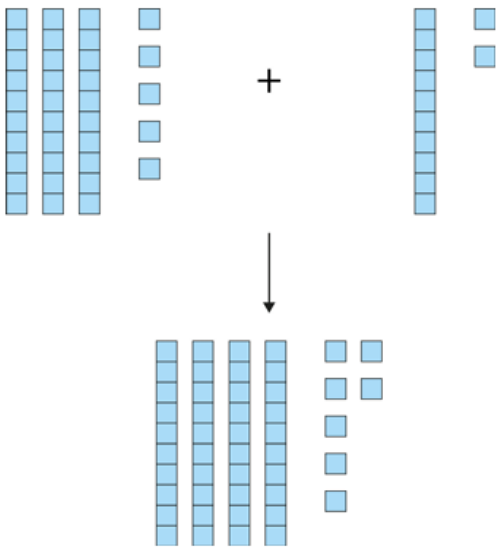


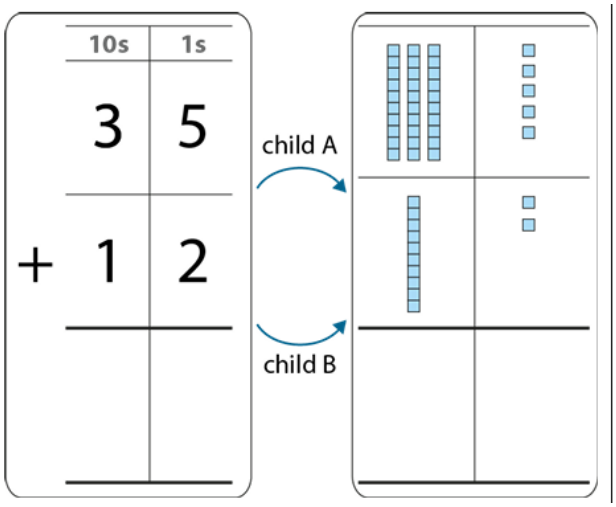


$$3+8 = 3+7+1$$
$$= 10+1$$
$$= 11$$

Step 6: Use resources to show adding tens and ones to then move on to column addition layout (no exchanging)

Dienes:

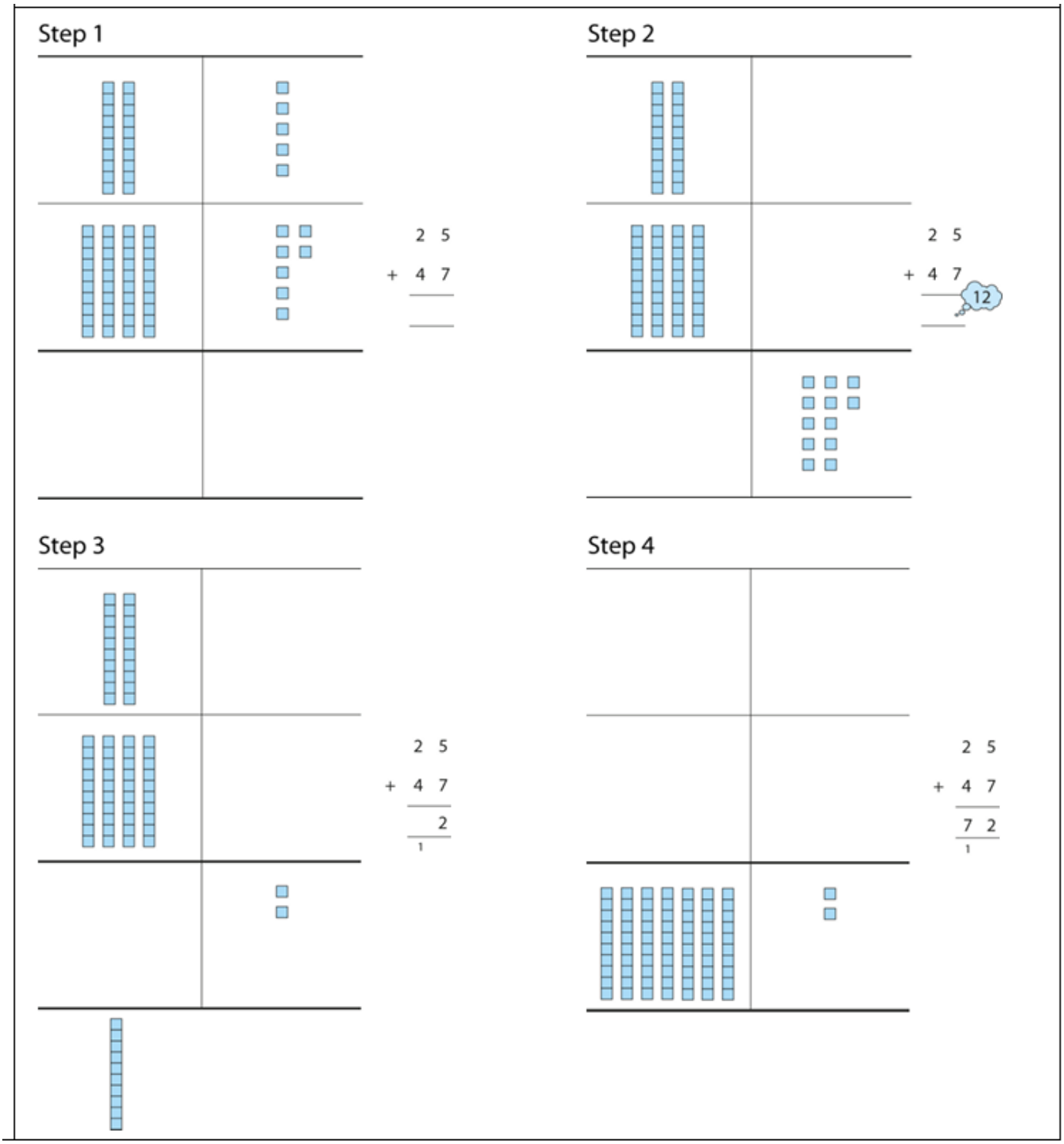




Column addition:

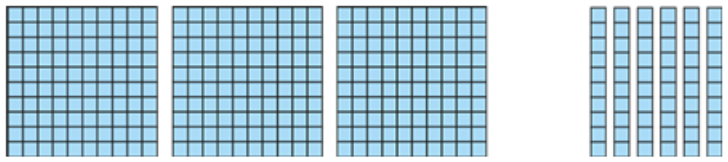
$$\begin{array}{r} 3\ 5 \\ +\ 1\ 2 \\ \hline 4\ 7 \end{array}$$

Step 7: Use resources to show adding tens and ones to then move on to column addition layout (to include exchanging)

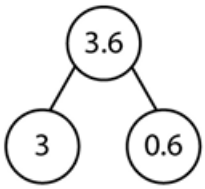


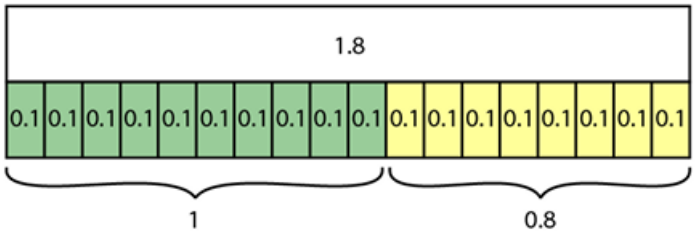
Step 8: To know that numbers with tenths can be added

Dienes:

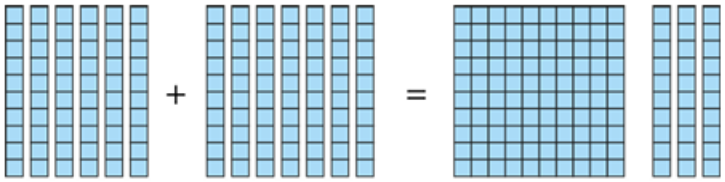


Part–part–whole model:





Dienes – example addition calculation:

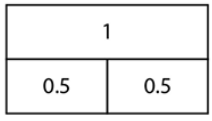


'Six tenths plus seven tenths is equal to thirteen tenths, which is equal to one-point-three.'

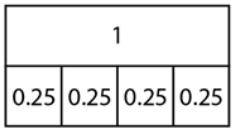
$$\begin{array}{r} 3.2 \\ +\ 5.7 \\ \hline \\ \hline \end{array} \qquad \begin{array}{r} 4.5 \\ +\ 3.9 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 6.5 \\ -\ 2.3 \\ \hline \\ \hline \end{array} \qquad \begin{array}{r} 4.3 \\ -\ 1.7 \\ \hline \\ \hline \end{array}$$

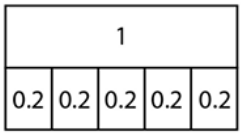
Step 9: Numbers with hundredths and thousandths can be added and to understand the composition to 1 whole:



$1 = 0.5 + 0.5$



$1 = 0.25 + 0.25 + 0.25 + 0.25$

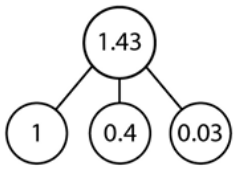


$1 = 0.2 + 0.2 + 0.2 + 0.2 + 0.2$

Step 10: Numbers with hundredths and thousandths can be added using resources and models before moving on to formal written methods.

Place-value counters:

Part–part–part–whole model:



Additive equations:

1.43 = 1 + 0.4 + 0.03

'Complete the calculations.'

	0	.	5	2			4	.	2	5
+	1	.	3	4		+	3	.	3	9
		.						.		

	0	.	5	3			1	.	3	6
+	0	.	7	3		+	1	.	6	8
		.						.		

	0	.	3	7	
	0	.	2	5	
	0	.	6	9	
+	1	.	7	2	
		.			

Step 11: formal addition with larger numbers (to include decimals to 3dp)

Column addition:

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