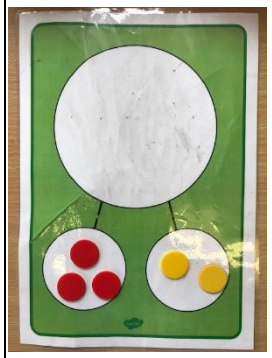
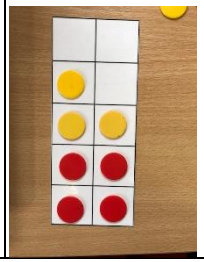
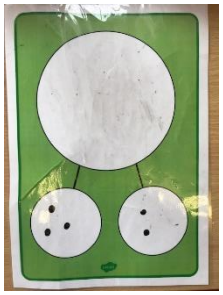
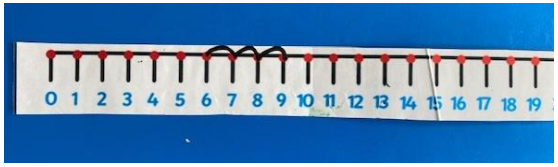
Wychwood Calculation Policy- Addition

Objective and strategy	Concrete	Pictorial	Abstract
Combining two parts to make a whole. YR/Y1	 Use cubes/counters/numicon to add together two groups. Use counters/objects on a cherry model to work out the answer.   When using a ten frame, always fill up from the bottom.	Draw on cherry models to work out the answer.  Use a number line and count in 1s to work out the answer. 	Record number sentences. 6 + 3 = 9 Progress to representing addition number sentences in the following way 9 = 6 + 3

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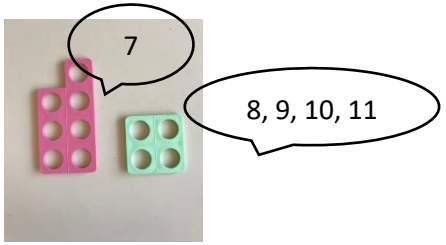
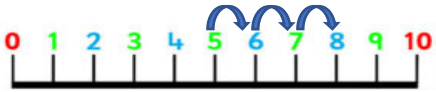
	 With numicon- always place the two parts together to encourage children to recognise which new number it makes. They will need to begin by counting but will move towards recognising the new number as a whole. **<u>Progression in working out the answer:</u>** Children will begin by counting the total amount by counting each object one by one. They will progress to 'carry on counting' and counting a number as a whole first (see carry on counting below)		
Carry on counting progression Children understand that addition is commutative and is more efficient to start on biggest number. Y1	 <u>Count the first number. Then use carry on counting for the second number.</u> Move towards recognising the first number without the need to count.	 5 + 3 <u>Start on the biggest number. Count on in ones to find the answer.</u> Remind children that we always jump on or next door to find the answer. A misconception that is common is that children will count the number they are starting on rather than jump to the next number.	<u>Put the biggest number in your head</u>.  Count on in ones to find the answer. 

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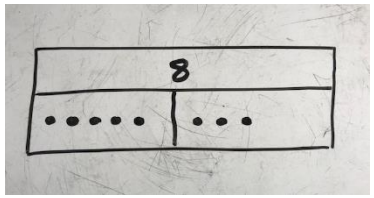
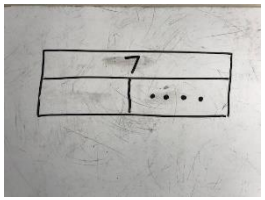
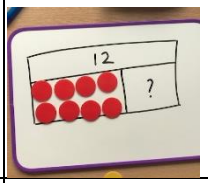
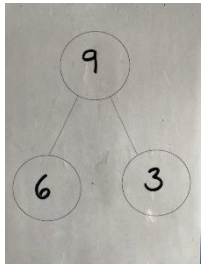
Using a bar model to add. YrR/Yr1- concrete. Yr1/Yr2- pictorial/abstract Progression: explore the missing number in different places. Use to relate to subtraction facts	 5 + 4 = 9 Understand that the top of the bar is the total and the bottom is the parts.	Children draw their own bar models. 	Missing bar model problems - mentally working out what you need to do to work out the answer. 4 + ? = 7  A concrete approach is useful for first introducing this. Begin by using ants on a log. 
Represent and use number bonds and related subtraction facts within 20 YR – recall bonds to 5 fluently. Have a deep understanding of composition of numbers to 10. Yr1 – represent and use bonds to	Explore with numicon how to make different numbers. Lay on top of a number you are trying to make. Use resources to find all the bonds to a given number.  3 + 4 = 7 (7 underneath)	Use cherry models to represents bonds to a given number. Understand that we can write the addition in different ways. 6 + 3 = 9 3 + 6 = 9 9 = 6 + 3 9 = 3 + 6 	Abstract use of number bonds: Children will begin to work systematically to find all the bonds to a given number. They will work towards recording this with no resources to support them. They will apply knowledge of bonds to 10 to bonds to 20 e.g. 7 + 3 = 10 so 17 + 3 = 20.

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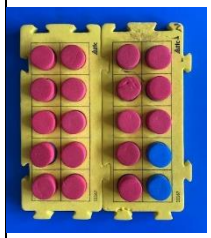
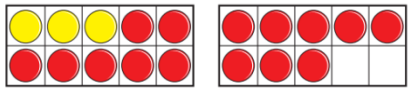
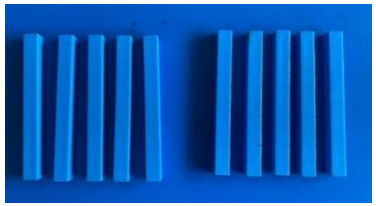
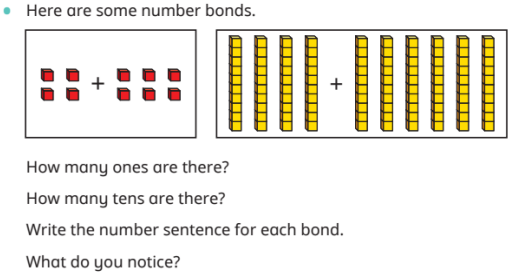
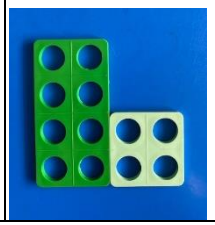
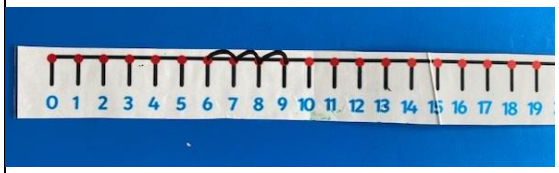
20 – addition and subtraction. Yr2 – instant recall of all bonds to 20. For bonds within 20, e.g. 13, 18, 11 etc, children should have strategies to work these out quickly.	 Use resources to work out bonds to 20.	 Children can use images of counters on ten frames to write two addition and two subtraction facts. These four facts are known as a fact family. 3 + 15 = 18 15 + 3 = 18 18 – 3 = 15 18 – 15 = 3	Being able to recall all bonds up to 20 fluently means children should be able to work out missing number facts using their bonds knowledge. 17 + ? = 20 5 + ? = 8
Bonds to 100 Yr 2	Use diennes to explore bonds to 100. Lay on top of the 100 base to support this. 	Children can complete sentences like the one below using the pictorial images.  Here are some number bonds. How many ones are there? How many tens are there? Write the number sentence for each bond. What do you notice?	Children use knowledge of number bonds to 10 to recall number bonds to 100, e.g. if they know 2 + 8 = 10, they can state 20 + 80 = 100. Children use knowledge of number bonds within 10 to apply to other areas e.g. if they know 2 + 5 = 7, they can use this knowledge to state 20 + 50 = 70.
Adding ones. Yr R – concrete/pictorial and exploring this with numbers to 20. Yr1/Yr2 – all	Use numicon to work out the answer using carry on counting. 	Use numberlines to add on ones.  	Progress to exploring related facts e.g. 17 + 5 = 22 5 + 17 = 22 22 – 17 = 5 22 – 5 = 17

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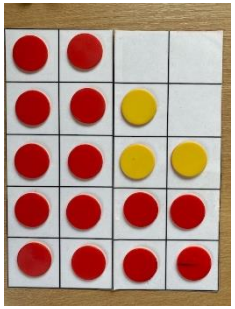
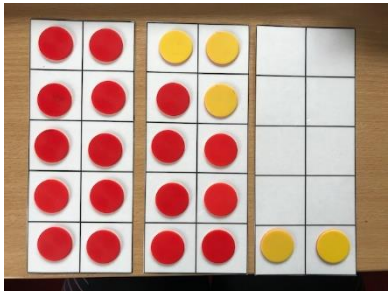
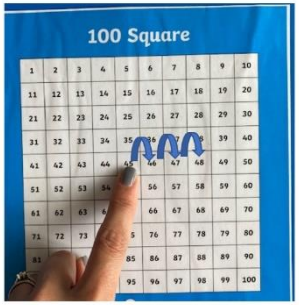
	14 + 3 Use counters on ten frames to work out the answer. Children should work towards being able to make the first number quickly on the ten frames without counting e.g. I know 14 is a ten and a four so I don't need to count this out. Add the extra counters and either use carry on counting to work out the answer or work towards recognising the number as a whole.   17 + 5 Use the ten frames and counters. Make 17 quickly by knowing it is made from a 10 and a 7. Add on the 5. Children may need to use carry on counting in tens and then ones (e.g. 10, 20, 22) but should progress towards recognising 22.	Counting on in ones using a 100 square e.g. 45 + 3 	Use known facts to work out others quickly e.g. 3 + 1 = 4 so 23 + 1 = 24. When calculations are written with the smallest number first, children should use the commutative property of addition to support them e.g. 2 + 35 – rather than count on 35, children should work out 35 + 2.
Missing number sentences YR – concrete	3 + ? = 9 Begin by using resources to work out the answer.	Use cherry models and work out missing number sentences.	Work out harder number sentences with a calculation on each side of the equals sign

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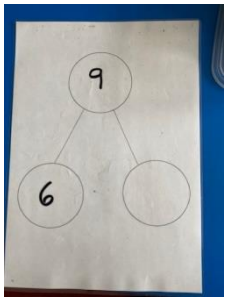
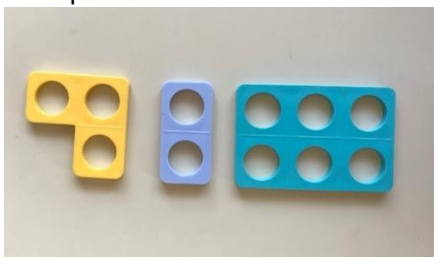
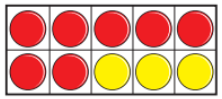
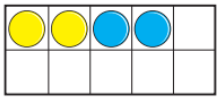
Yr1/2 – all	Collect the total (9) and then lay on of the parts (3) on top of the total to clearly see the missing number. 		e.g. 14 + 3 = 15 + ? 45 + 8 = 50 + ?
Add three 1 digit numbers. Yr1 – concrete and pictorial Yr2 – all	Use numicon to explore the addition of three numbers. Notice which numbers make 10 (if possible). Children may begin by laying a ten over the top but should move towards recognising which numbers will make ten and then counting what is left. Example 1: 6 + 4 + 1 = 11 Example 2: 	  Use picture representations to record and work out number sentences. 7 + 5 + 2 = 14	Progress to working out the answer in the most efficient way. For example, looking for known facts such as bonds to 10 or doubles. E.g 6 + 3 + 6. 6 + 6 = 12 12 + 3 = 15 7 + 5 + 3 7 + 3 = 10 10 + 5 = 15 Use this knowledge to work out missing number problems. 3 + _____ + 7 = 19 _____ + 4 + 6 = 11

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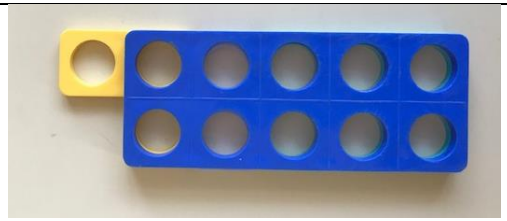
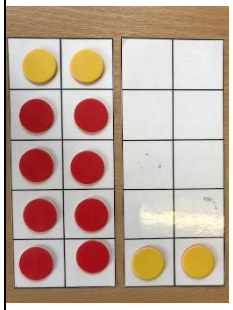
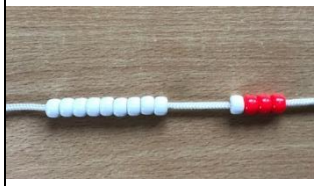
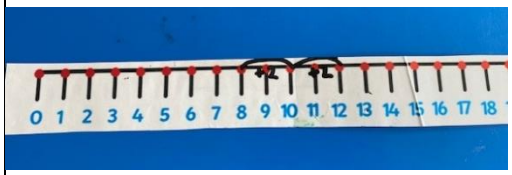
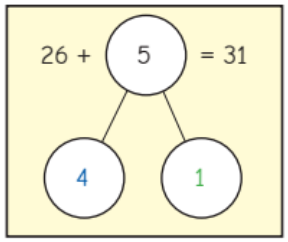
			
Add by making 10 Yr 1 - concrete Y2- all	 8 + 4 Begin with using counters to work out the answer. Children can use carry on counting to work out the answer (recognising the 10 and then counting 11, 12) but should move towards recognising teen numbers instantly e.g. I know the answer is 12 because 12 is a ten and a two.  9 + 4 The colours of the beads on the bead string make it clear how many will need to be added to make 10. A good knowledge of number bonds up to 10 is essential for this step.	8 + 4 = 12 Partition the smaller number to reach ten and add the rest.  Represent this on a cherry model.  	Progress towards mentally partitioning the smaller number and adding this in your head. E.g. 8 + 2 = 10 + another 2 = 12 Apply to numbers to 100 e.g. 43 + 8.

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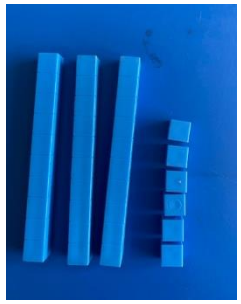
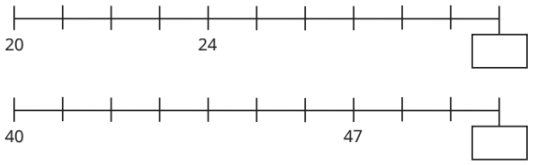
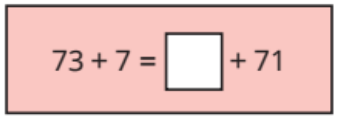
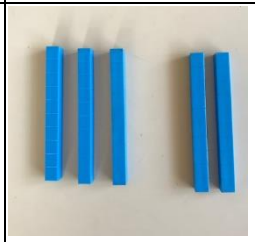
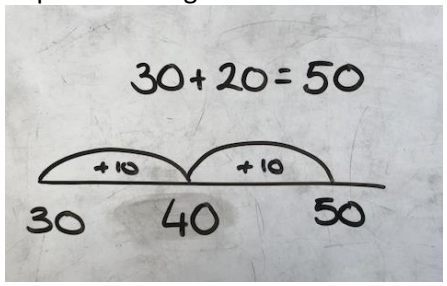
Add to the next 10 Y2	36 + ? = 40 Use diennes to work out how many more to get to the next ten. 	Work out missing numbers on a number line.  	Use knowledge of number bonds to 10 to apply to missing number sentences with numbers to 100. ▸ 24 + _____ = 30 ▸ 47 + _____ = 50 ▸ 40 = 31 + _____ Apply to harder problems with a number sentence on each side of the equals sign. 
Adding multiples of ten. Y1/Y2	 Use resources to count in tens. 30 + 20 	Represent using a number line.  Use a 100 square to work out number sentences such as 53 + 10, 53 + 20 etc. Know that to jump 10 we go down a box and understand this is the same as making ten jumps.	Use carry on counting to count on in tens. 30 + 20 

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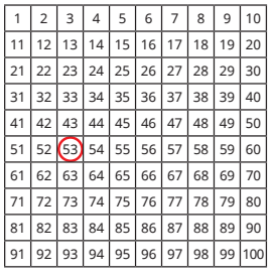
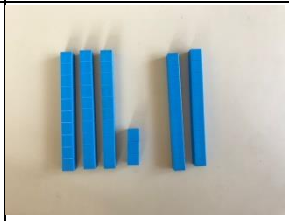
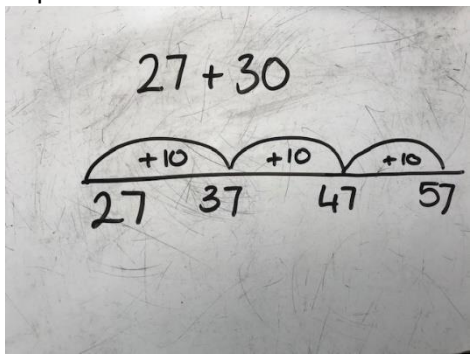
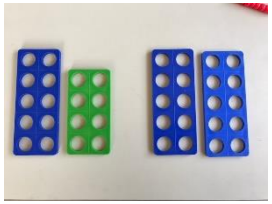
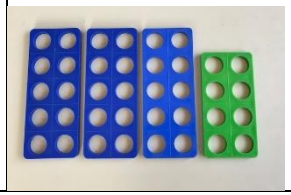
				
Add a 2 digit number and tens. Y1/Y2		33+ 20 Count the tens and then the ones.	Represent on a numberline. 	Working this out mentally. Begin by using fingers to support counting on in tens (see counting multiples of 10 for photo). Progress to working out in head.
		18 + 20 You could rearrange the tens to make counting the answer easier.		
				

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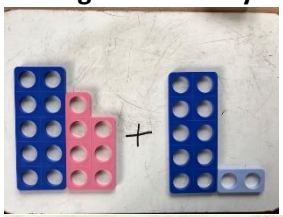
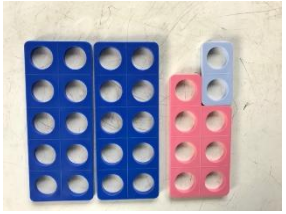
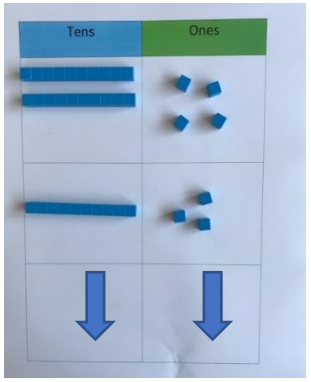
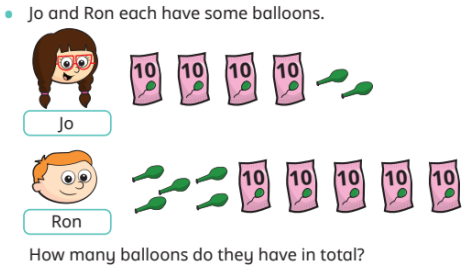
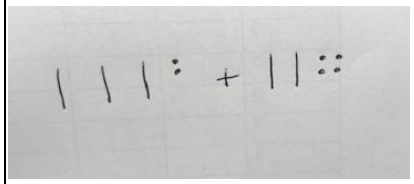
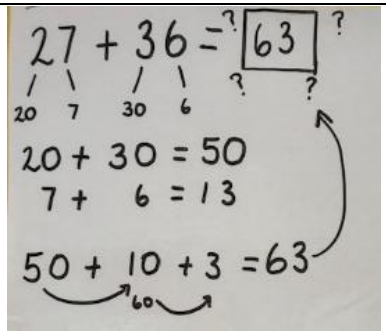
Add two 2 digit numbers. Y1/Y2 (Yr2 only for tens and ones sheet and for method where you need to take and make a ten)	**Adding with friendly numbers (no regrouping):**  Use numicon, place value counters or diennes.  Arrange the two numbers separately at first and then put the tens and ones together to use carry on counting to work out the answer. Work towards recognising the number – e.g. a twenty and a 9 so it is 29.  24 + 13 Use diennes on a tens and ones mat. Move the tens and ones down to the bottom box to work out the answer.	Use pictorial representations to work out the  total. Draw representations for the tens and ones. 32 + 24  Draw cherry models to represent the number sentence	 Work it out by partitioning the two whole numbers into tens and ones.

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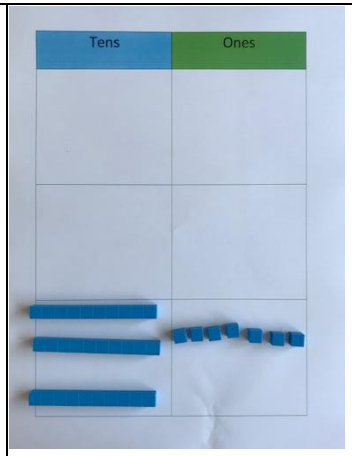
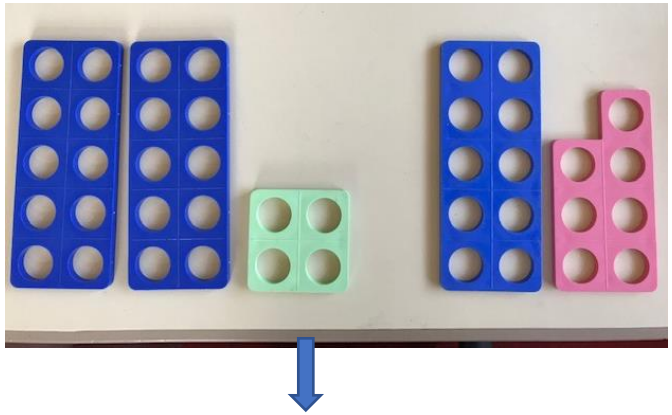
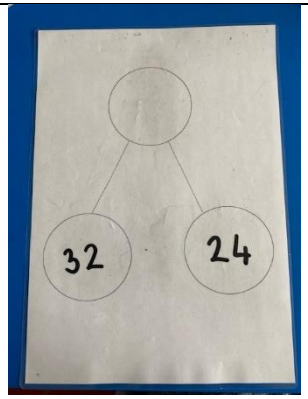


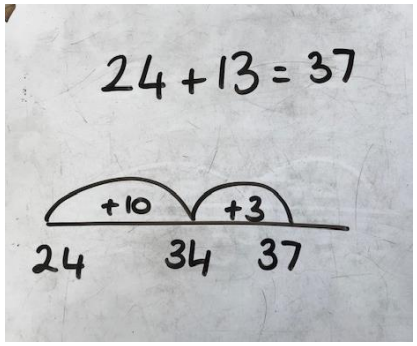
Count in tens and ones to find the answer.

Adding where regrouping is required:

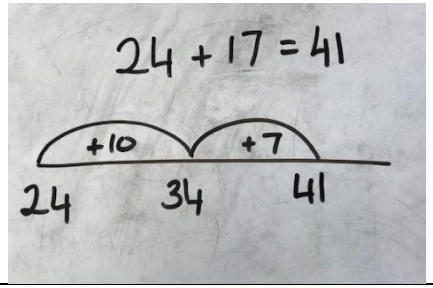
24 + 17





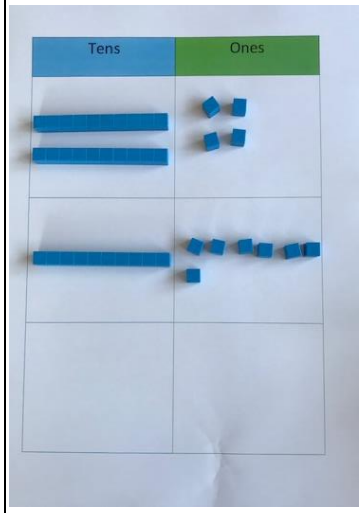


Use a numberline to work out the answer by partitioning the tens and ones.



Wychwood Calculation Policy- Addition

Arrange the tens and ones together. Count the tens and the seven together (37) and use carry on counting to get to 41.
Below shows the progression for when children are ready to start exchanging. The above method should be used until children are secure in using this method and using a numberline.

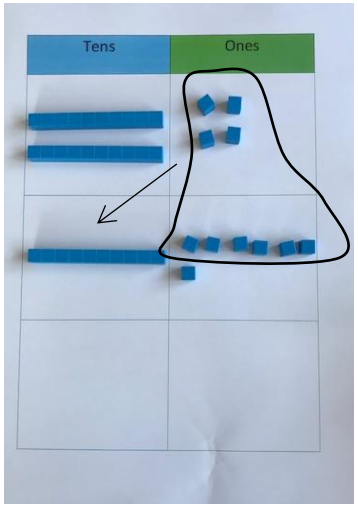


24 + 17

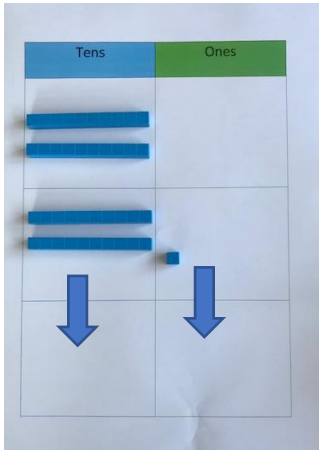
Children should recognise that they will need to exchange or ''take and make' a ten.

Children can use a numberline for when they will have to cross a tens boundary. Their knowledge of number bonds should help them to add the ones. E.g. 34 + 7- "I know I can add 6 to get to 40 and then add 1 more".

Wychwood Calculation Policy- Addition

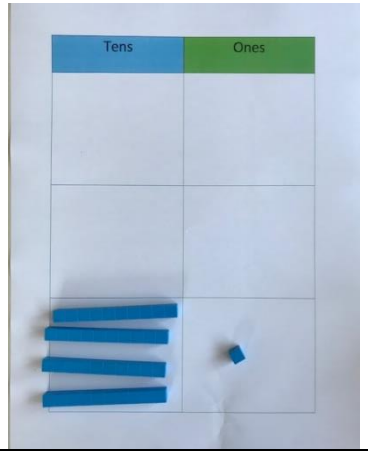


First, add the ones. Regroup 10 ones into one 10.



Then, move downwards as before.

Wychwood Calculation Policy- Addition

	 Count the tens and ones to work out the total.		