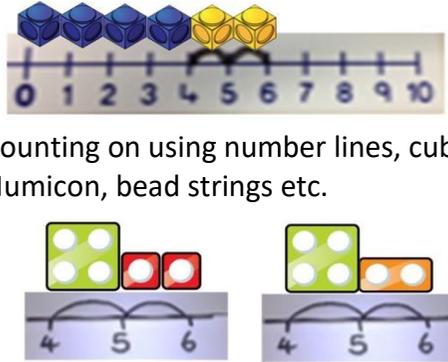
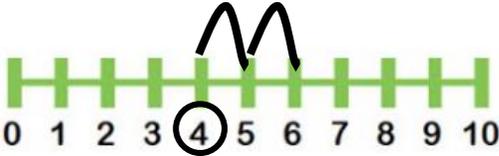
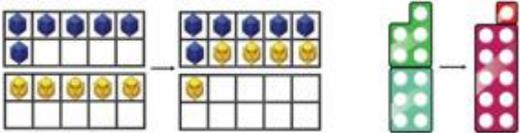
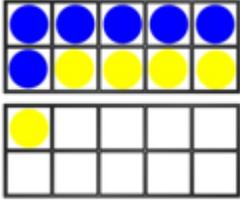
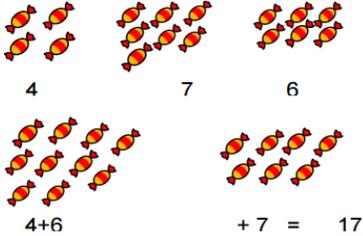
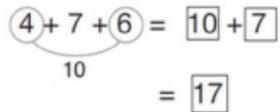
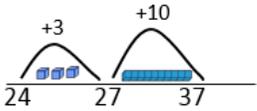
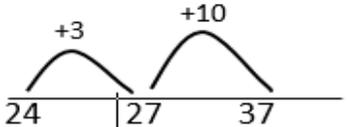
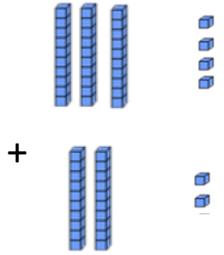
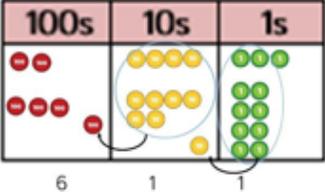
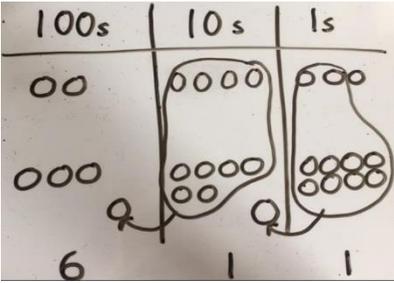
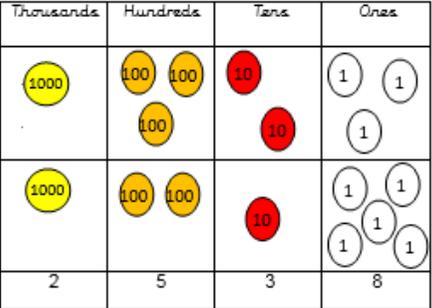
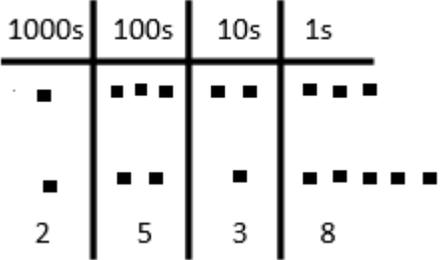
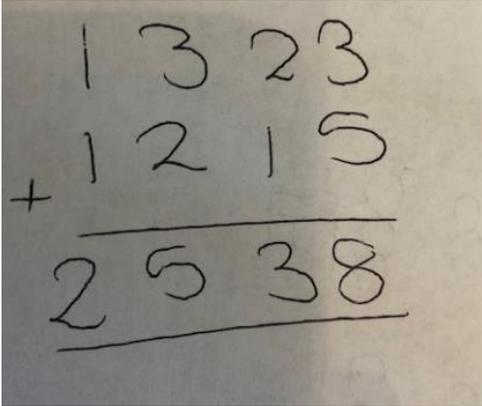


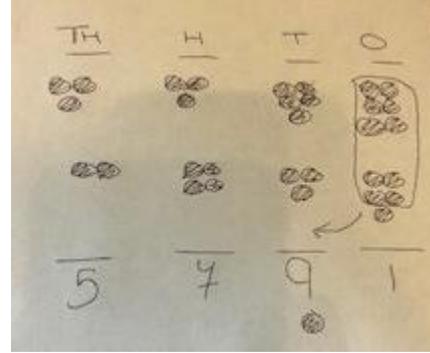
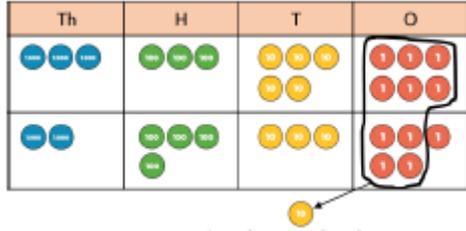
	Objective	Concrete	Pictorial	Abstract
Foundation	Find one more of a given number.	<p>Use practical resources to count on one more.</p>	<p>Children record using dots/starts etc to show one more.</p> <p>They move onto jumping on number tracks.</p>	$2 + 1 = 3$
	Combine two parts to make a whole.	<p>Use other resources too e.g. eggs, shells, teddy bears, cars, dinosaurs. Try to use objects linked to the class topic.</p>	<p>Use pictures along with part, part, whole models to show two parts becoming one. Children could progress onto their being 3 parts.</p> <p>When ready children use cubes and then dots to record into a part, part, whole model.</p>	$4 + 3 = 7$ Four is a part, three is a part and the whole is seven.

Year 1	<p>Start at the bigger number and count on (cubes followed by number line/track)</p>	 <p>Counting on using number lines, cubes, Numicon, bead strings etc.</p>	 <p>Start with the larger number and jump on in ones</p>	<p>What is 2 more than 4?          What is the sum of 2 and 4?          What is the total of 4 and 2?  <math>4 + 2 =</math></p>
	<p>Regrouping to make 10.</p>	<p>Ten frames and counters/cubes or using Numicon.</p> 	<p>Children to draw the ten frame and counters/cubes.</p> 	<p>Children to develop an understanding of equality e.g.</p> <p><math>6 + \underline{\quad} = 11</math>  <math>6 + 5 = 5 + \underline{\quad}</math>  <math>6 + 5 = \underline{\quad} + 4</math></p>
<p>Year 2</p>	<p>Add three single digits.</p> <p><math>4 + 7 + 6 = 17</math>          Add 4 and 6 together to make 10. Then add on 7.</p>  <p>Following on from making 10, make 10 with 2 of the digits (if possible) then add the third digit.</p>	 <p>Add together three groups of objects. Draw a picture to recombine the groups to make 10.</p>	<p><math>4 + 7 + 6 = 17</math></p>  <p>Combine the two numbers that make 10 and then add on the remainder.</p>	

	<p>Count on using a number line.</p>	$\begin{array}{r} 24 + 13 \\ \phantom{24} \swarrow \searrow \\ 10 \quad 3 \end{array}$  <p>Children use dienes to partition. They place on an empty number line, starting with the ones.</p>	$\begin{array}{r} 24 + 13 \\ \phantom{24} \swarrow \searrow \\ 10 \quad 3 \end{array}$  <p>If the + symbol is removed, inverse relationship can be modelled.</p>	<p>Children progress onto recording on to their own empty numbers looking at larger numbers etc.</p>																								
	<p>Partitioning and regrouping to add pairs of numbers.</p>	<p>Use Base 10 and place value grids to practically partition and regroup.</p> <table border="1" data-bbox="560 726 817 973"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>5</td> <td>6</td> </tr> </tbody> </table> <p>Combine the ones first and then tens.</p>	Tens	Ones					5	6	 <p>5      6</p>	$34 + 22 =$  $4 + 2 = 6$  $30 + 20 = 50$  $50 + 6 = 56$																
Tens	Ones																											
																												
																												
5	6																											
<p>Year 3</p>	<p>Use the expanded column method to add pairs of numbers (no regrouping).  Up to 3 digits</p>	<p>Use Base 10/place value counters and place value grids to practically partition and regroup.</p> <table border="1" data-bbox="548 1149 873 1380"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>5</td> <td>6</td> </tr> </tbody> </table>	Hundreds	Tens	Ones							3	5	6	<p>Children use informal jottings.</p> <table border="1" data-bbox="1086 1093 1545 1372"> <thead> <tr> <th>100s</th> <th>10s</th> <th>1s</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>5</td> <td>6</td> </tr> </tbody> </table>	100s	10s	1s							3	5	6	$\begin{array}{r} 224 \\ + 132 \\ \hline 6 \\ 50 \\ 300 \\ \hline 356 \end{array}$
Hundreds	Tens	Ones																										
																												
																												
3	5	6																										
100s	10s	1s																										
																												
																												
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	<p>Use the expanded column method to add pairs of numbers (regrouping)</p> <p>Up to 3 digits</p>	<p>Use of place value counters to add HTO + TO, HTO + HTO etc. When there are 10 ones in the 1s column- we exchange for 1 ten, when there are 10 tens in the 10s column- we exchange for 1 hundred.</p>  <p>A place value chart with columns labeled 100s, 10s, and 1s. The 100s column contains 6 red counters. The 10s column contains 1 yellow counter. The 1s column contains 1 green counter. Below the chart are the digits 6, 1, and 1.</p>	<p>Children to represent the counters in a place value chart, circling when they make an exchange.</p>  <p>A place value chart with columns labeled 100s, 10s, and 1s. The 100s column has 2 circles. The 10s column has 4 circles. The 1s column has 3 circles. Below the chart are the digits 2, 4, and 3. Arrows indicate the exchange of 10 ones for 1 ten and 10 tens for 1 hundred.</p>	$\begin{array}{r} 243 \\ + 368 \\ \hline 11 \\ 100 \\ \hline 500 \\ \hline 611 \end{array}$
<p>Year 4</p>	<p>Column method to add pairs of numbers.</p> <p>Up to 4 digits</p>	<p>Use of place value counters to add numbers together including numbers up to 4 digits numbers.</p>  <p>A place value chart with columns labeled Thousands, Hundreds, Tens, and Ones. The Thousands column has 2 yellow 1000 counters. The Hundreds column has 5 yellow 100 counters. The Tens column has 3 red 10 counters. The Ones column has 8 white 1 counters. Below the chart are the digits 2, 5, 3, and 8.</p>	<p>Children to represent the counters in a place value chart.</p>  <p>A place value chart with columns labeled 1000s, 100s, 10s, and 1s. The 1000s column has 1 black square. The 100s column has 3 black squares. The 10s column has 2 black squares. The 1s column has 3 black squares. Below the chart are the digits 1, 3, 2, and 3.</p>	 <p>Handwritten column addition showing 1323 + 1215 = 2538. The columns are labeled 1000s, 100s, 10s, and 1s. The result 2538 is written below a horizontal line.</p>

Children add up to two 4 digit numbers with one exchange



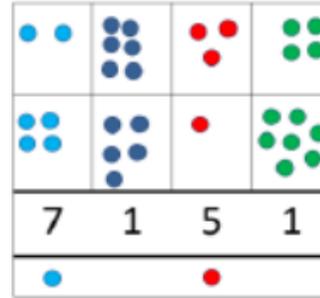
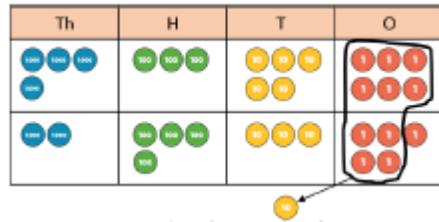
	Th	H	T	O
	3	3	5	6
+	2	4	3	5
	5	7	9	1
				1

Include examples of 4 digit + 3 digit and 4 digit + 2 digit.

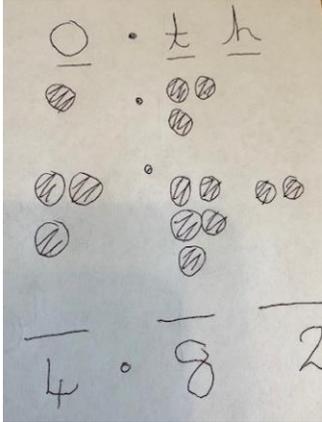
Year 5

Column method to add pairs of numbers. 4 digit numbers and beyond (more than one exchange).

As shown above, but with more than one exchange (see pictorial column for example).

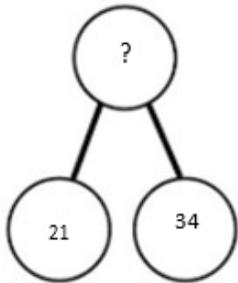


	3	5	1	7
+		3	9	6
	3	9	1	3
				1

	<p>Adding decimal numbers with different decimal places (up to 3 decimal places).</p> <p>Problems involving exchanges.</p>	<table border="1" data-bbox="510 197 994 529"> <thead> <tr> <th>Ones</th> <th>Tenths</th> <th>Hundredths</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.1 0.1</td> <td></td> </tr> <tr> <td></td> <td>0.1</td> <td></td> </tr> <tr> <td>1 1</td> <td>0.1 0.1</td> <td></td> </tr> <tr> <td>1</td> <td>0.1 0.1</td> <td>0.01 0.01</td> </tr> <tr> <td></td> <td>0.1</td> <td></td> </tr> </tbody> </table> <p>Exchanges as shown in concrete and pictorial images above.</p>	Ones	Tenths	Hundredths	1	0.1 0.1			0.1		1 1	0.1 0.1		1	0.1 0.1	0.01 0.01		0.1			$\begin{array}{r} 72.8 \\ + 54.6 \\ \hline 127.4 \end{array}$ $\begin{array}{r} 11 \\ \hline \end{array}$ <table border="1" data-bbox="1818 347 2087 497"> <tr><td>£</td><td>23</td><td>.</td><td>59</td></tr> <tr><td>+</td><td>£</td><td>7</td><td>55</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td>£</td><td>30</td><td>.</td><td>14</td></tr> </table> <p>Exchanges for calculations below as shown above.</p> <p>Focus on using zero as a place holder (see subtraction Year 5).</p> $\begin{array}{r} 4.4 \\ + 7.044 \\ \hline \end{array}$ $\begin{array}{r} 4.42 \\ + 1.6 \\ \hline \end{array}$	£	23	.	59	+	£	7	55	<hr/>				£	30	.	14
Ones	Tenths	Hundredths																																				
1	0.1 0.1																																					
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£	23	.	59																																			
+	£	7	55																																			
<hr/>																																						
£	30	.	14																																			
Year 6	Consolidate understanding using numbers with more than 4 digits and extend by adding numbers with up to 3 decimal places.	As Year 5 – review as necessary.	<p>Adding several numbers with increasing complexity:</p> <table border="1" data-bbox="1662 976 1899 1187"> <tr><td>8</td><td>1,059</td></tr> <tr><td>3,668</td><td></td></tr> <tr><td>15,301</td><td></td></tr> <tr><td>+</td><td>20,551</td></tr> <tr><td colspan="2"><hr/></td></tr> <tr><td>1</td><td>20,579</td></tr> </table> <p>Adding place holders to support place value in calculations:</p>	8	1,059	3,668		15,301		+	20,551	<hr/>		1	20,579																							
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3,668																																						
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			$\begin{array}{r} 81,059 \\ 3,668 \\ 15,301 \\ + 20,551 \\ \hline 120,579 \end{array}$ $\begin{array}{r} 23 \cdot 361 \\ 9 \cdot 080 \\ 59 \cdot 770 \\ + 1 \cdot 300 \\ \hline 93 \cdot 511 \end{array}$
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## Conceptual variation; different ways to ask children to solve 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?

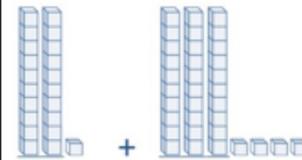
$21 + 34 = 55$ . Prove it

$$\begin{array}{r} 21 \\ +34 \\ \hline \end{array}$$

$21 + 34 =$

   =  $21 + 34$

Calculate the sum of twenty-one and thirty-four.



Missing digit problems:

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

Key Vocabulary: add, addition, sum, total, parts and wholes, plus, altogether, more, more than, and, increase, count on.