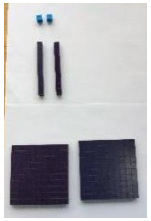
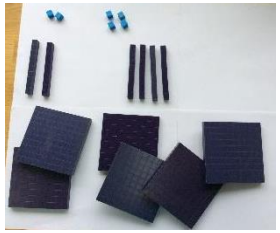
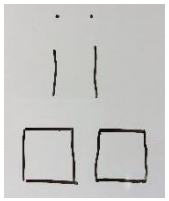
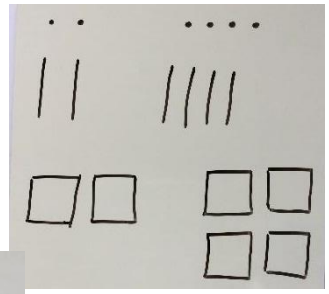
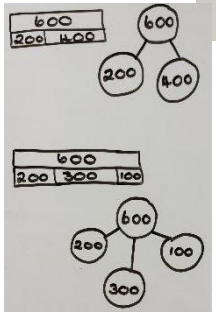
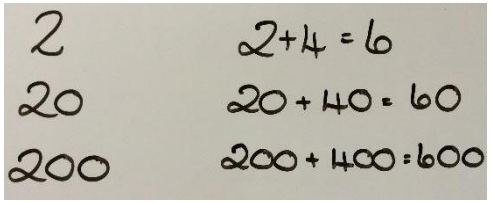
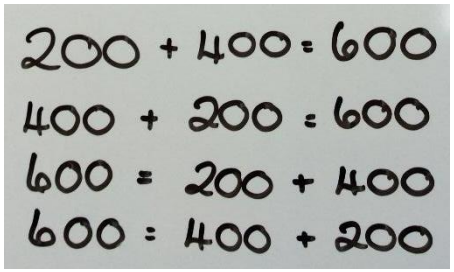
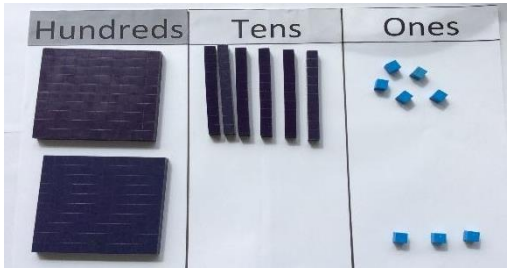
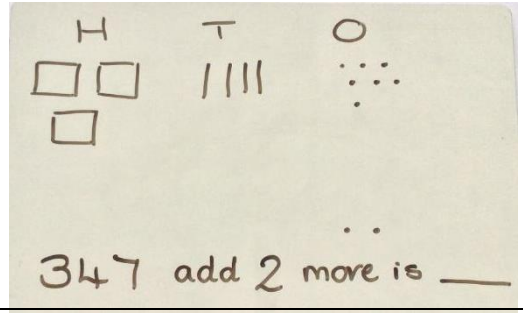
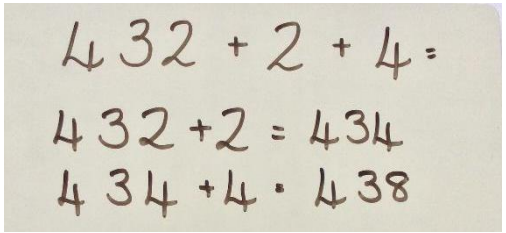
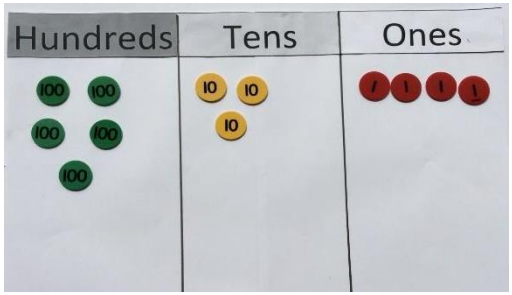
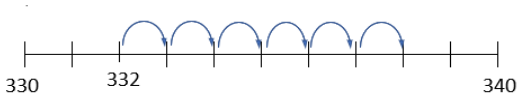
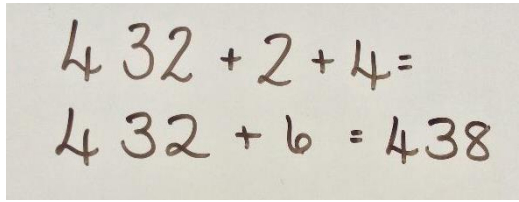
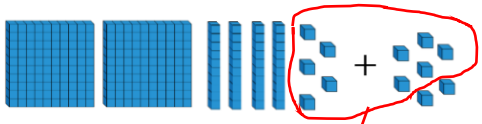
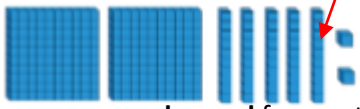
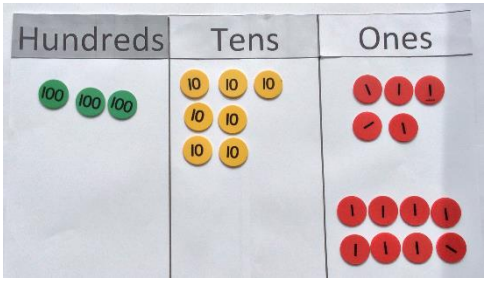
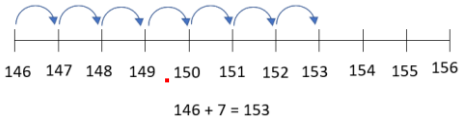
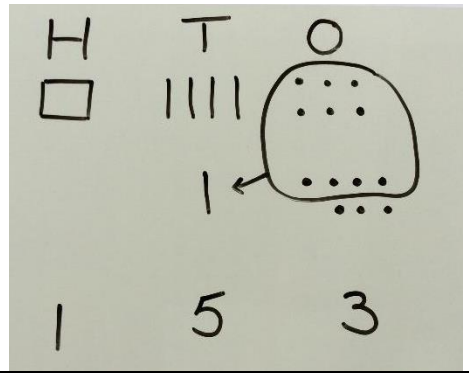
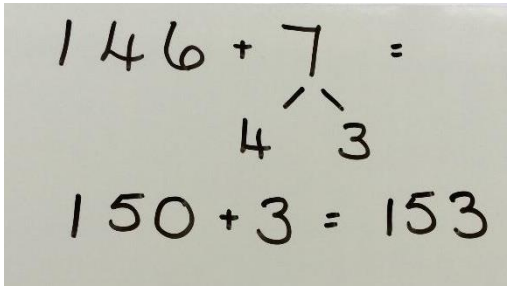
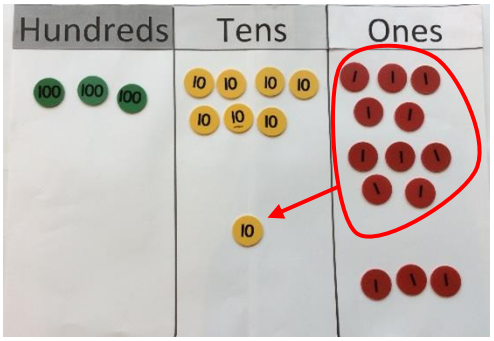
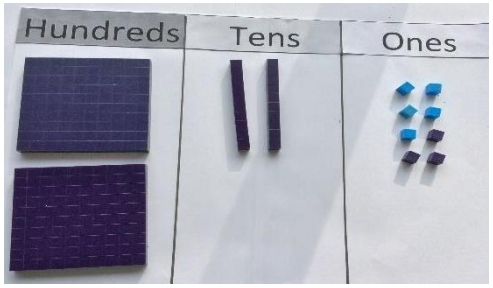
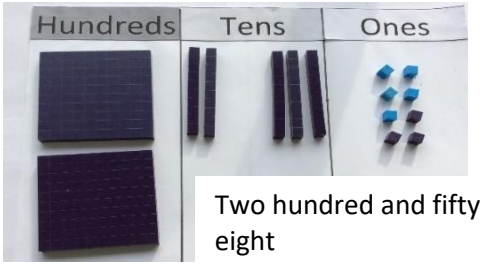
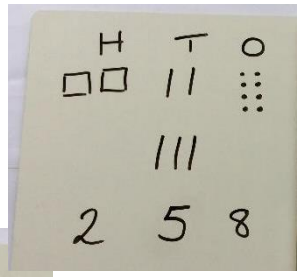
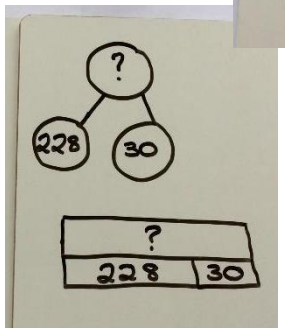
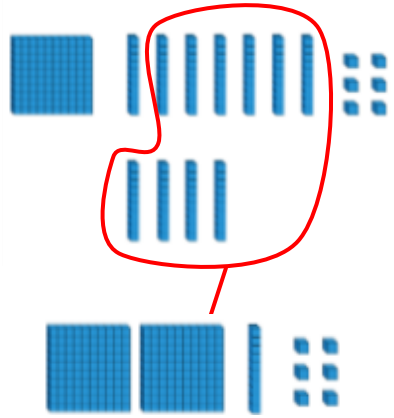
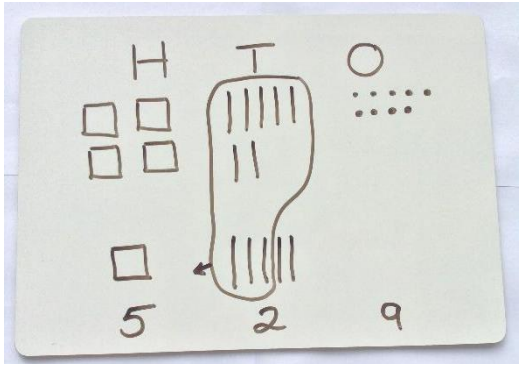
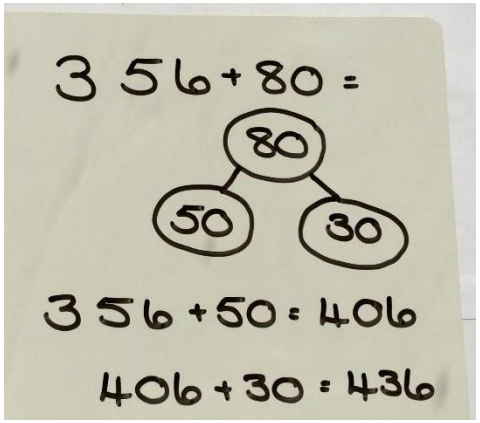
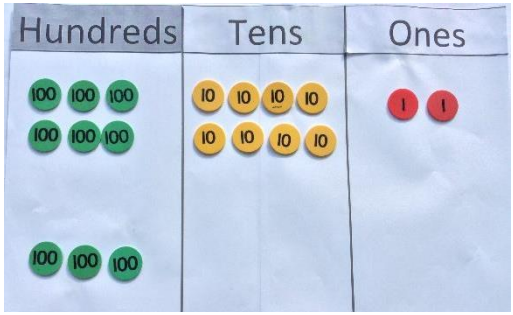
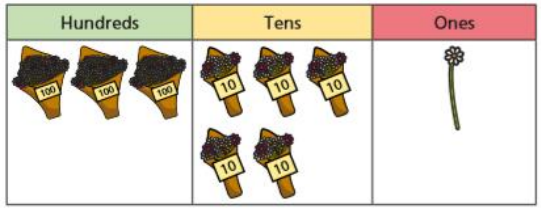
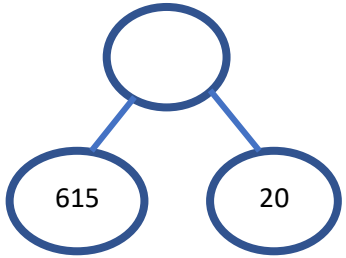
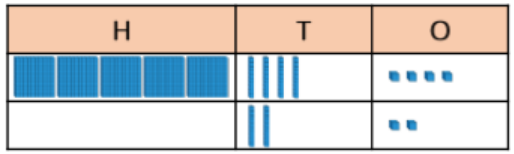
Wychwood Maths Policy- Addition

Objective and strategy	Concrete	Pictorial	Abstract
Year 3 **Add multiples of 100** Children apply their prior knowledge of adding ones and tens to adding multiples of 100. They explain what is the same and what is different. They look for patterns and links between the representations and value of the digits.	They discuss what is the same and different about 2 ones, 2 tens and 2 hundreds using Diennes to show how large the numbers are.  They find the sum of: ● 2 ones and 4 ones ● 2 tens and 4 tens ● 2 hundreds and 4 hundreds. 	Record representations of the numbers on whiteboards thinking about relative size.    They use Bar and Cherry Models (part-whole models) to represent and solve problems.	Record the value of each number using digits.  2 2+4=6 20 20+40=60 200 200+400=600 They find 'families' of number sentences to show relationships.  200 + 400 = 600 400 + 200 = 600 600 = 200 + 400 600 = 400 + 200
Add 3-digits and 1-digit – not crossing 10 Children add ones to a 3-digit number without exchange. They focus upon the ones' column. Mental strategies, rather than column addition, are promoted as they are most efficient.	Use Diennes or Place Value Counters to represent the addition.  265 and 3 more is _____	Record representations of the numbers on whiteboards.  	Asher wants to work out 432 + 2 + 4 Show two ways that he could do this.  432 + 2 + 4 = 432 + 2 = 434 434 + 4 = 438

	 Sarah has added ones to get this answer. What could her calculation have been?	Amir says that the answer to this calculation is 337. Do you support or challenge him? Explain your thinking using the representation to help you. 	
Add 3-digits and 1 digit – crossing 10 Children discover that when adding ones, it can affect the ones and the tens column. They learn that once there are ten ones they have to be exchanged for a ten.	Two hundred and forty five add seven more makes …  two hundred and fifty two.  Ten ones are **exchanged** for one ten. 375 + 8 = 	When counting on, the tens' boundary is crossed to reach the final answer.  Record representations of the numbers on a whiteboard or notebook. 146 + 7 = 153 	The ones digit can be partitioned to complete the number bond to 10.  6 and 4 make the number bond to 10 so 7 is split into a 4 and 3. The 4 is added first to take the number to the next ten then the three.

	Ten ones are gathered together and … Exchanged for a ten.  375 + 8 = 383		
Add 3-digits and 2-digit – not crossing 100 Children find out what happens when a multiple of ten is added. Mental methods are encouraged as they the most efficient.	Eva adds 3 tens to her number. What is her new number?   Two hundred and fifty eight	Representations are recorded on a white board to visualise and support solving the problem.  228 add three more tens  	230 + 60 = _____ What multiples of 10 could complete this calculation? 726 + _0 + _0 = 7_6

	How many more tens can be added to Eva's number before exchange will be needed? 4 (298)		
Add 3-digits and 2 digit – crossing 100 Children add multiples of 10 to a 3-digit number. They recognise that adding tens can change both the tens and the hundreds column. They count in tens as it is more efficient than column addition.	Using Diennes or place value counters to exchange 10 tens for a hundred. One hundred and seventy six add forty more makes …  two hundred and sixteen. Ten tens are **exchanged** for one hundred.	Show the 'collecting up' of ten tens and exchanging for 100 by drawing representations. 479 + 50 = 529 	The multiple of ten can be partitioned to create a bond to 100 in the tens column. A Cherry model could be used to show the partitioning.  50 and 50 make the number bond to 100 so 80 is split into a 50 and 30. The 50 is added first to take the number to the next hundred then the 30 is added.

Adding 100s Children extend their knowledge of adding 1s and adding 10s to adding 100s by seeing and using patterns.	Children use Diennes or place value counters on a place value chart to solve problems where multiples of 100 are added without crossing the thousands boundary. They notice that only the digit in the hundred's column is affected.  Six hundred and eighty two add three more hundreds make nine hundred and eighty two.	Brett has some flowers. He buy three more large bunches.   How many flowers does he have now altogether?	
Add a 2-digit and 3-digit numbers not crossing 10 and 100 Children focus on the position and place value of digits to add 2-digit and 3-digt numbers. They group digits in columns to lead into the next stage of column addition with exchange.	Using Diennes or place value counters, children create the two numbers and then gather the 100s, 10s and 1s together in their columns to find the total. There is no exchange. 243 add to 36 makes 279	Children interpret diagrams gathering up the 100s, 10s and 1s in their respective columns to find the total. 544 + 22 = 566  	Bar Models and Cherry models aid the interpretation of word problems and column addition is used to find an answer. The 3-digit number (larger number) is placed first and the 2-digit number written below with careful thought to the place value of each digit. Place value headings support the placement of numbers.

Wychwood Maths Policy- Addition

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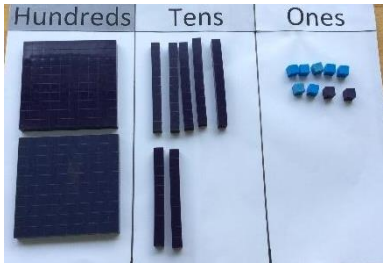
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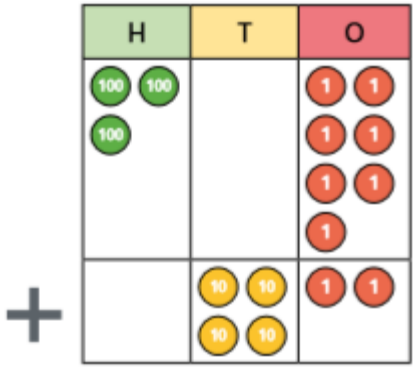
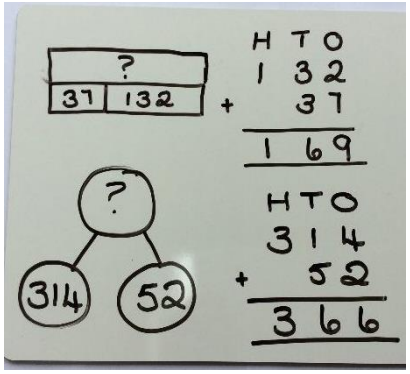
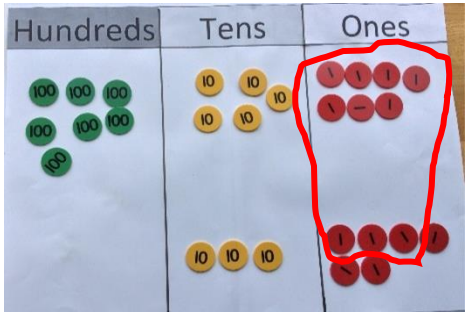
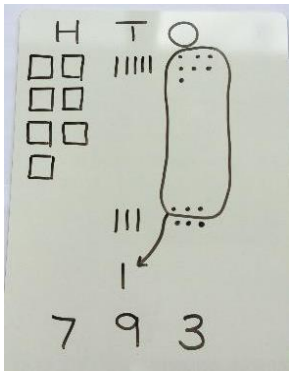
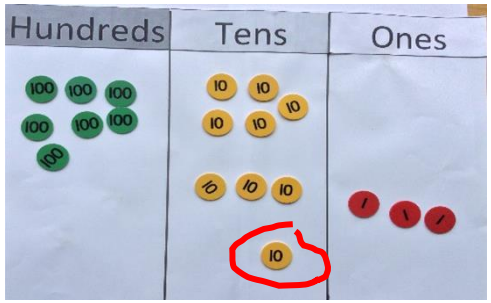
<td> 

307 + 42 = 349</td>
<td>On Friday Jim's hens laid 37 eggs. Over the weekend they laid another 132 eggs. How many did they lay altogether?


Charlie is off to feed the penguins at the zoo. He has 314 fish in his truck and needs another 52. How many fish will he take to the penguins?</td>
</tr>
<tr>
<td>Add a 2-digit and 3-digit numbers crossing 10 and 100
Children begin by adding numbers where there is exchange from ones to tens column. They go on to exchange tens for hundreds. Finally, they complete calculations with exchange from both columns. Concrete methods support children's understanding of the abstract column method.</td>
<td>What is thirty six more than seven hundred and fifty seven?


Both numbers are set out on a place value chart. There are 13 ones.</td>
<td>Children draw representations of Diennes.
757 + 36 =
As there are 13 ones, children draw round 10 ones and exchange them for a ten.

</td>
<td>Children transfer their understanding of exchange to formal column addition.
<table>
<tr><td></td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td>7</td><td>5</td><td>7</td></tr>
<tr><td>+</td><td></td><td>3</td><td>6</td></tr>
<tr><td></td><td>7</td><td>9</td><td>3</td></tr>
<tr><td></td><td></td><td>1</td><td></td></tr>
</table>
757 + 36 =</td>
</tr>
</table>

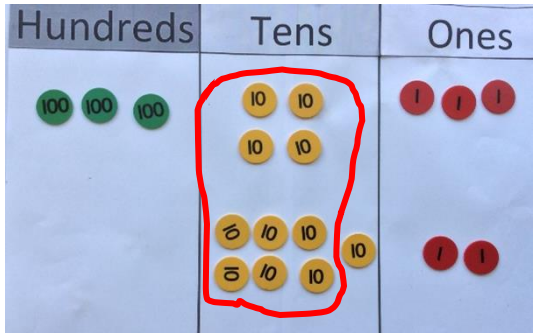
Ten ones are grouped together and exchanged for a ten.



757 + 36 = 793

343 + 72 =

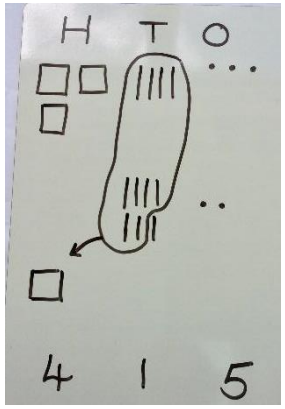
This time there 11 tens so ten tens need to be grouped together.



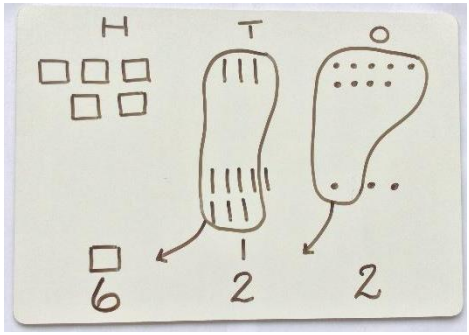
They are exchanged for one hundred which is placed in the hundred's column.

343 + 72 =

As there are 11 tens, children draw round 10 tens and exchange them for a hundred.



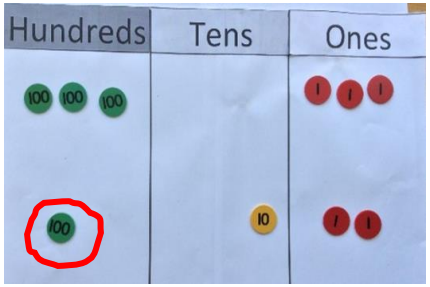
539 + 83 =



As there are more than 10 ones and more than 10 tens, exchange is shown in both the ones and tens column.

343 + 72 =

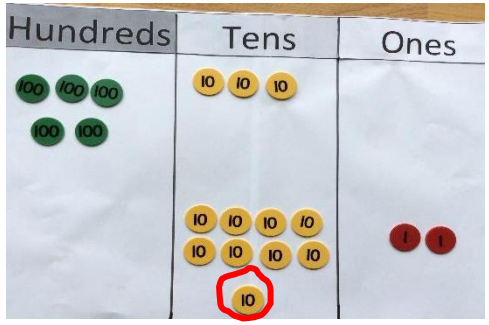
	H	T	O
	3	4	3
+		7	2
	4	1	5
	1		



3**4**3 + **7**2 = 415

5**39** + **83**

There are more than 10 ones so 10 are exchanged for a ten.



5**39** + **83** =

	H	**T**	**O**
	5	3	9
+		8	3
	6	2	2
	1	1	

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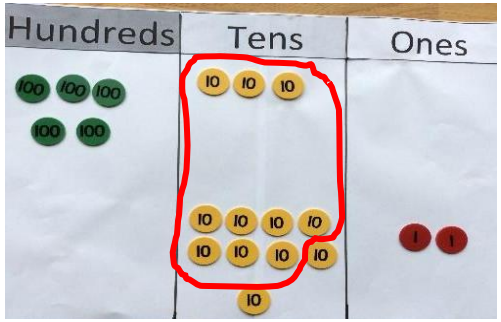
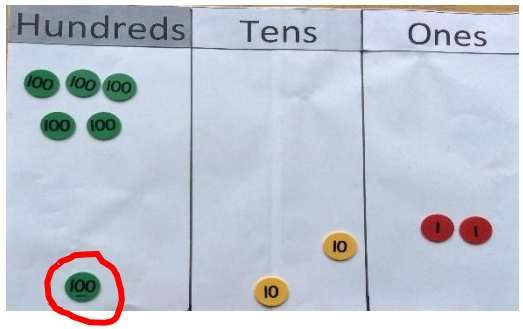
<td> 

There are more than 10 tens so 10 are exchanged for a hundred.


539 + 83 = 622</td>
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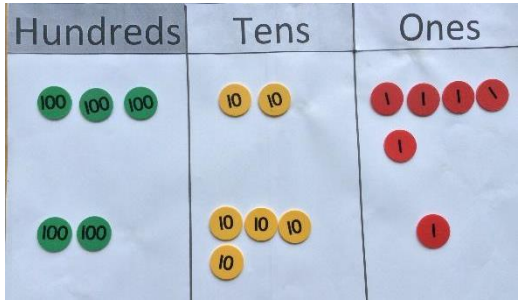
<tr>
<td>Add two 3-digit numbers - not crossing 10 and 100
Children focus on lining up the digits and setting out the addition clearly in columns. The need to exchange only when there are 10 or more in a column is reinforced.</td>
<td>325 + 200 = 566
 
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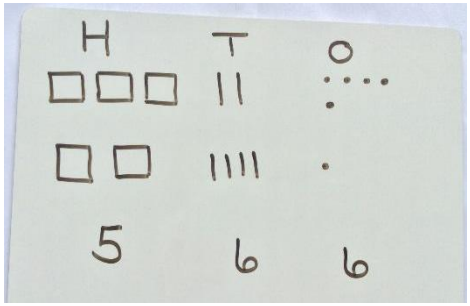
<td> 
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<table>
<tr><td></td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td>3</td><td>2</td><td>5</td></tr>
<tr><td>+</td><td>2</td><td>4</td><td>1</td></tr>
<tr><td></td><td>5</td><td>6</td><td>6</td></tr>
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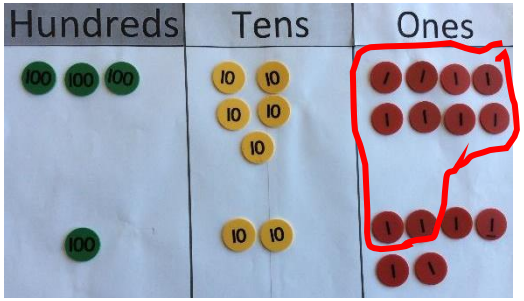
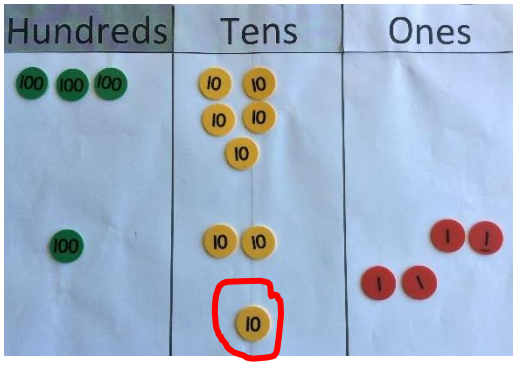
</table>

Add two 3-digit numbers - crossing 10 and 100

Children add two 3-digit numbers beginning with a single exchange in either the ones or tens column. They then experience working with exchange in both the ones and the tens. Finally, children will extend the pattern exchanging 10 hundreds for a thousand. Diennes and place value counters are still used to support understanding.

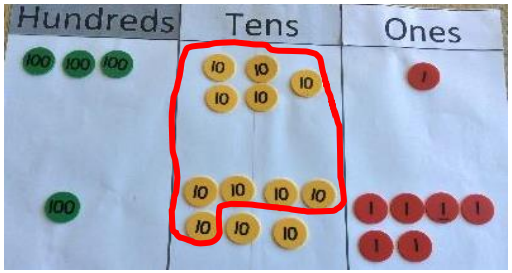
Only exchanging 10 ones for a ten.



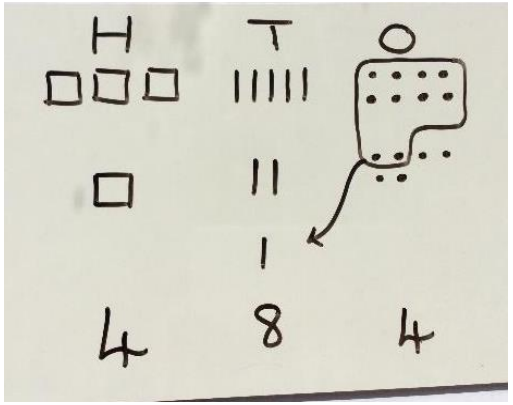


358 + 126 = 484

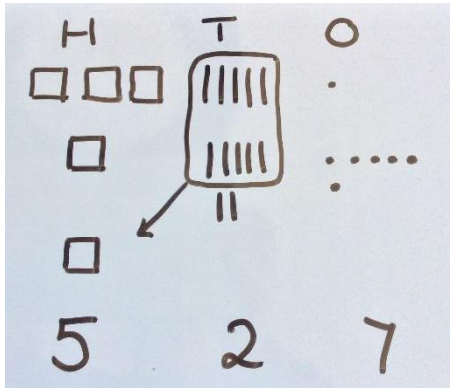
Only exchanging 10 tens for a hundred.



Only exchanging 10 ones for a ten.



Only exchanging 10 tens for a hundred.

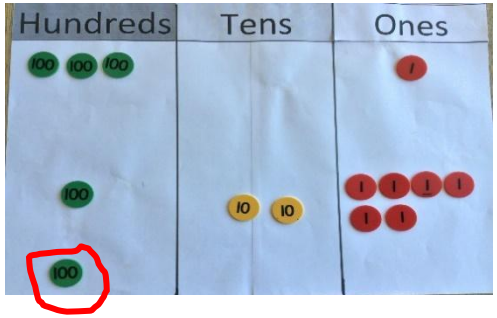


Only exchanging 10 ones for a ten.

	H	T	O
	3	5	8
+	1	2	6
	4	8	4
		1	

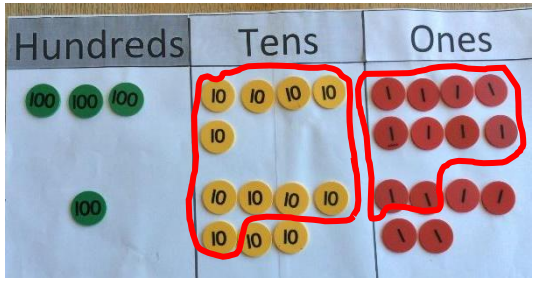
Only exchanging 10 tens for a hundred.

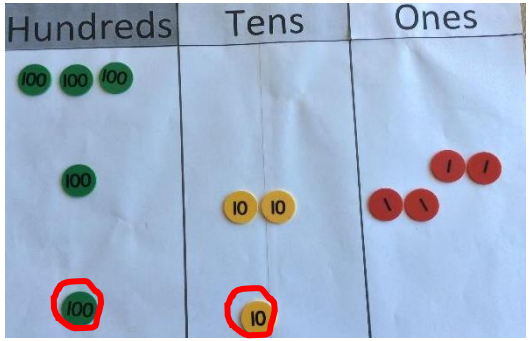
	H	T	O
	3	5	1
+	1	7	6
	5	2	7
	1		



351 + 176 = 527

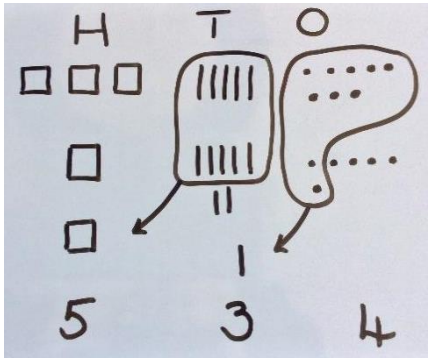
Exchanging 10 ones for a ten **and** 10 tens for a hundred.



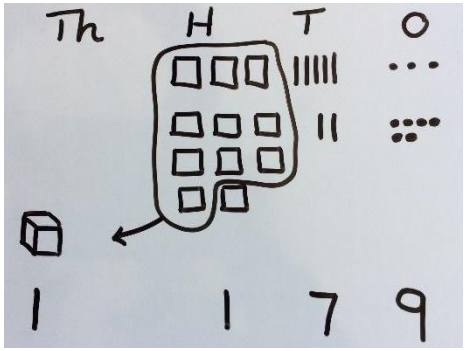


358 + 176 = 534

Exchanging 10 ones for a ten **and** 10 tens for a hundred.



Only exchanging 10 hundreds for a thousand. The thousands column is labelled to support children's thinking.

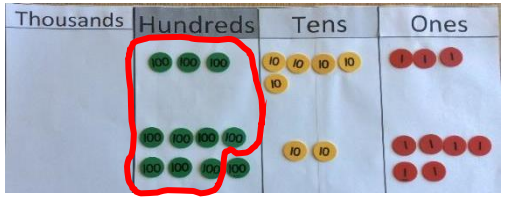
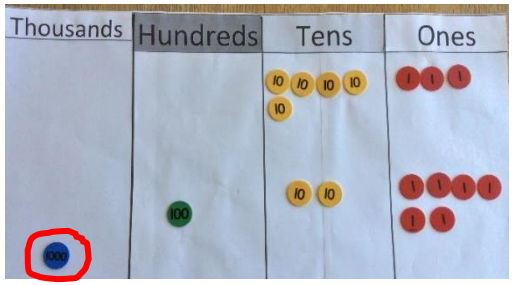
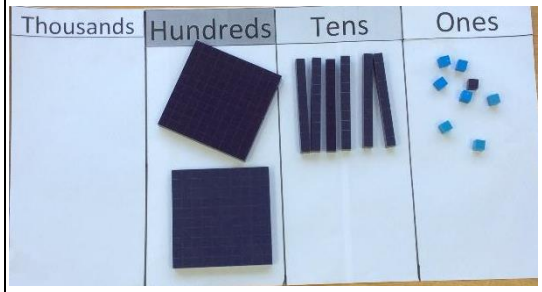
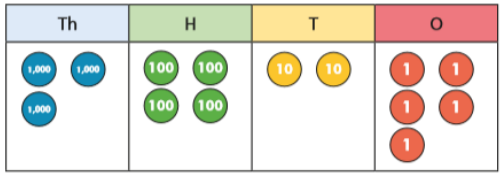


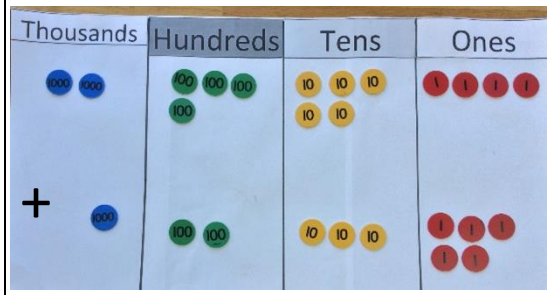
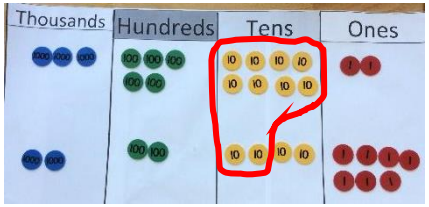
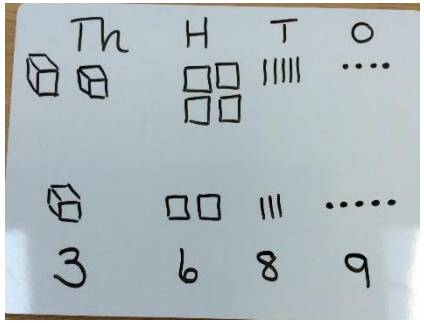
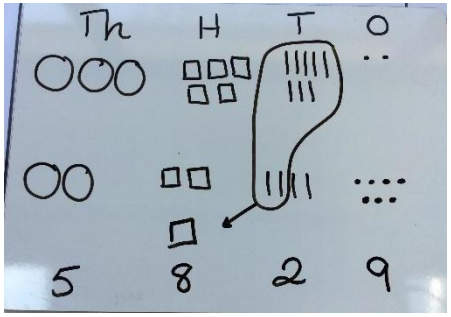
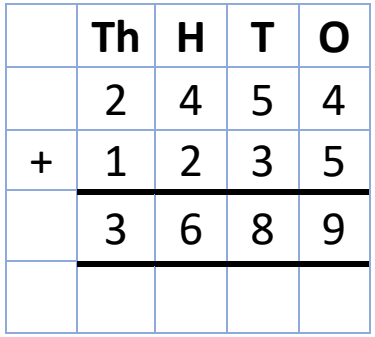
Exchanging 10 ones for a ten **and** 10 tens for a hundred.

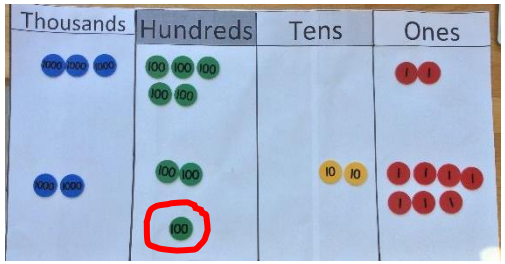
	H	T	O
	3	5	8
+	1	7	6
	5	3	4
	1	1	

Only exchanging 10 hundreds for a thousand. The thousands column is labelled to support children's thinking.

	Th	H	T	O
		3	5	3
+		8	2	6
	1	1	7	9
	1			

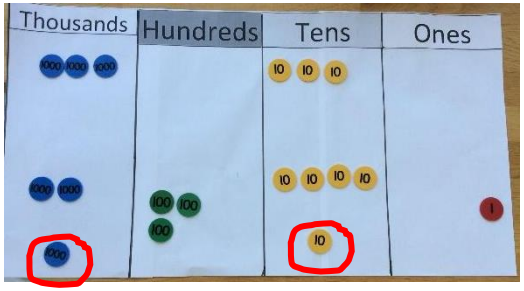
	Only exchanging 10 hundreds for a thousand. The thousands column is labelled to support children's thinking.   353 + 826 = 1179		
Year 4 Children build on their prior learning of adding ones, tens and hundreds when adding thousands. They identify when boundaries will be crossed and look for patterns and addition families. They continue to work with concrete and pictorial representations before moving to written and mental methods.	 Children work practically to answer questions such as: What is this number? What would the number be if I added 2 more tens?	 What number has Eric made? What number do you have when you add three hundreds? What number do you have when you add six tens? What number do you have when you add **five ones?**	3425 + 300 = 3725 3425 + 60 = 3485 342**5** + **5** = 3430 Addition family 3425 + 5 = 3430 5 + 3425 = 3430 3430 = 3425 + 5 3430 = 5 + 3425 Using pattern

	How many more hundreds would I need to make a thousand? How would I write my new number?		4078 + 1 = ___ 4078 + 10 = ___ 4078 + 2 = ___ 4078 + 20 = ___ 4078 + 3 = ___ 4078 + 30 = ___ 4 + 4078 = ___ 4078 + 40 = ___
Add two 4-digit numbers • **without exchange** • **with one exchange** • **with more than one exchange** Children extend their understanding of addition with 3-digits to adding 4-digits. They use practical methods to support their understanding alongside column addition.	Adding two 4-digit numbers with no exchange. Children use Diennes or place value counters to answer questions such as 2454 + 1235 = 3679  They recognise that there are less than 10 counters in each column so exchange is not needed. Add two 4-digit numbers with exchange in one column only. Will we have to perform an exchange? Explain how you know? 	They draw representations of the numbers. To solve problems.  2454 + 1235 = 3679 Adding with only one exchange. 3582 + 2247 = 5829 	 Children represent what they have discovered in their concrete and pictorial work in the column method. Adding with only one exchange.



3582 + 2247 = 5829

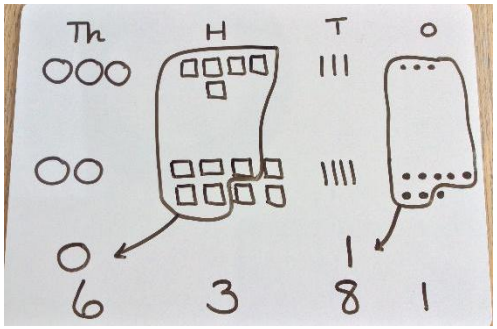
Add two 4-digit numbers with exchange in more than one column.
Will we have to perform an exchange in any of the columns? Explain how you know?



3533 + 2848 = 6381

Adding with more than one exchange.

3533 + 2848 = 6381



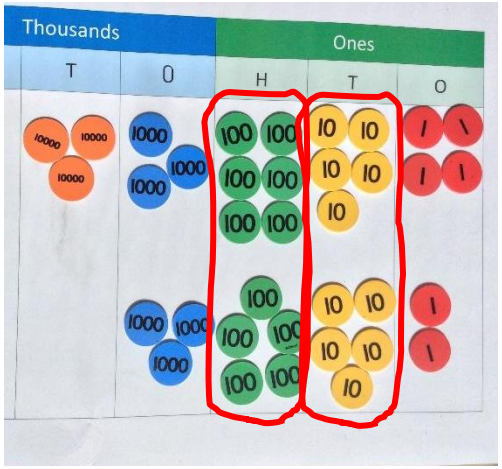
	Th	H	T	O
	3	5	8	2
+	2	2	4	7
	5	8	2	9
		1		

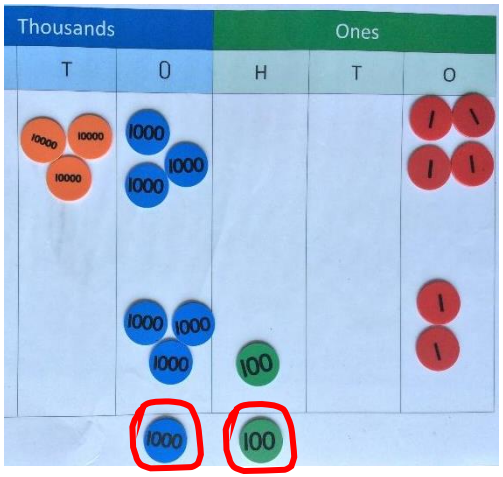
Adding with more than one exchange.

			<table><tr><td></td><td>**Th**</td><td>**H**</td><td>**T**</td><td>**O**</td></tr><tr><td></td><td>3</td><td>5</td><td>3</td><td>3</td></tr><tr><td>+</td><td>2</td><td>8</td><td>4</td><td>8</td></tr><tr><td></td><td>6</td><td>3</td><td>8</td><td>1</td></tr><tr><td></td><td>1</td><td></td><td>1</td><td></td></tr></table>
Year 5 **Adding larger numbers** In Year 5, children build upon their previous learning	For example: adding two numbers with a different number of digits and more than one exchange.	Children interpret pictorial representations and draw their own.	Children use column methods of addition with exchange. Place value heading support the accurate placement of digits.

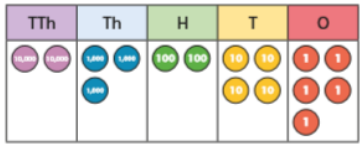
of column addition extending to numbers with more than four digits and adding more than two numbers. When adding numbers with a different number of digits, they focus on place value when setting out calculations. They continue to use manipulatives and pictorial representations alongside column addition to underpin their understanding.

33654 + 3552 = 37206





Complete the additions. Use the place value chart to help you.



a) 23,245 + 14,323 = ☐

b) 23,245 + 14,328 = ☐

	TTh	Th	H	T	O
	3	3	6	5	4
+		3	5	5	2
	3	7	2	0	6
		1	1		

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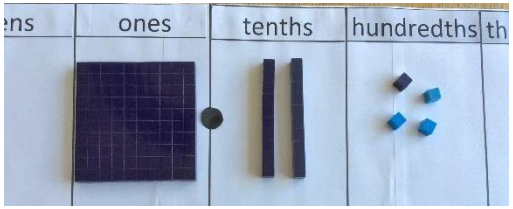
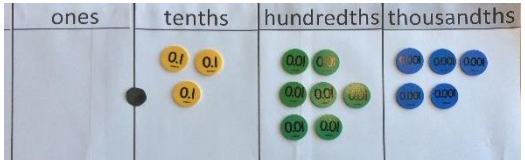
Adding decimals
Children extend their understanding of addition to work with decimal numbers with up to 3 decimal places

- **adding within 1**
- **adding crossing the whole**
- **adding numbers with the same number of decimal places**
- **adding numbers with a different number of decimal places**

If children are underconfident with the relative sizes of decimals, Diennes can be used as visual representations.



Adding within 1
Children use manipulatives to consider questions such as:

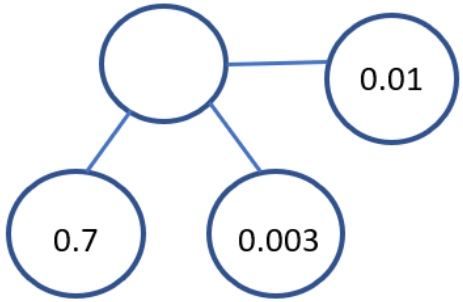


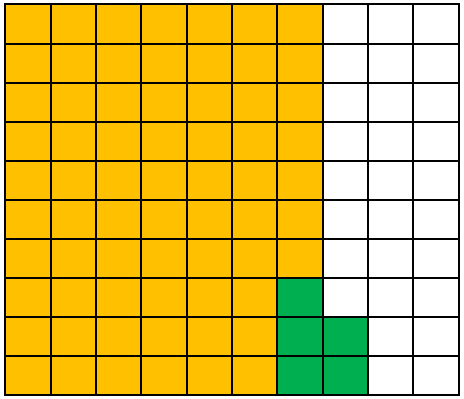
What number is one hundredths more?
If 0.3 is added, what is the new number?
How many more thousandths can I add before the hundredths digit changes?

Adding within 1
Children colour in hundred squares to add tenths and hundredths.

0.67 + 0.05 = 0.72

They interpret models and images.





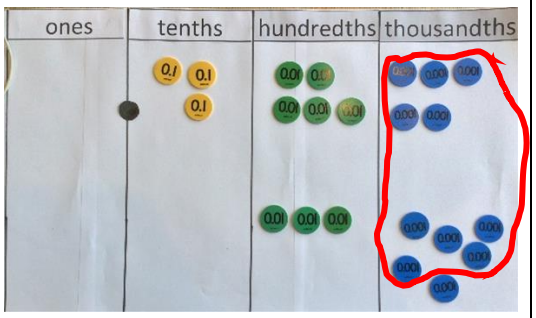
Adding within 1
Column addition is used to solve addition calculations.

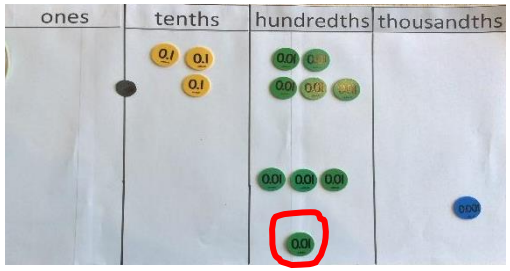
	O	.	t	h	th
	0	.	3	5	5
+	0	.	0	3	6
	0	.	3	9	1
				1	

Click here for a video.

They use PC counters to solve addition problems without then with exchange.

0.355 + 0.036 = 0.391

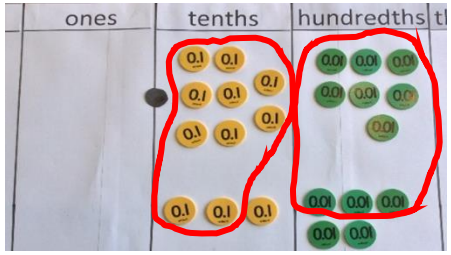


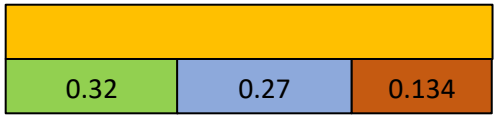


Crossing the whole

Concrete methods are extended to the exchange of tenths for ones.

0.87 + 0.35 = 1.22





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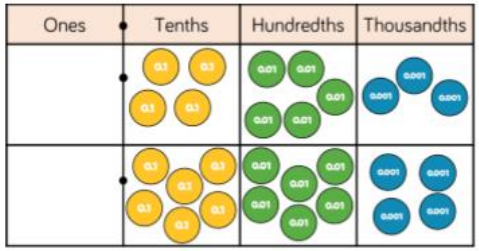
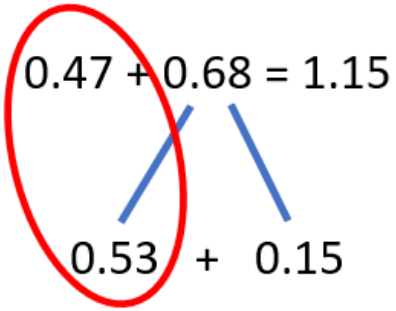
Crossing the whole

Diagrams are used to support exchange.



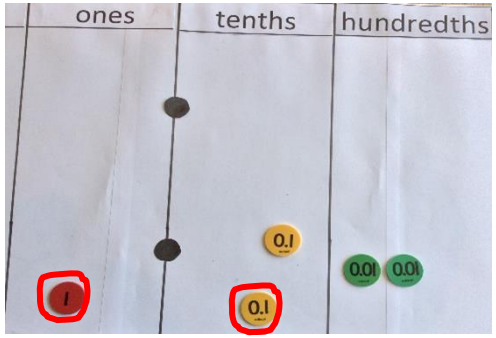
Crossing the whole

Numbers are partitioned to make compliments to 1.



Concrete and pictorial methods support column addition.

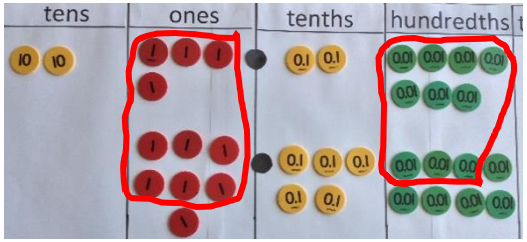
	O	.	t	h	th

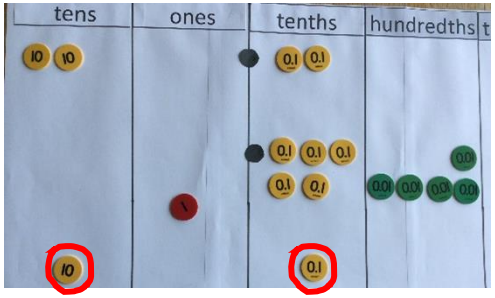


Adding decimals with the same number of decimal places.

Place value charts support children's understanding of the value of each digit and when to exchange.

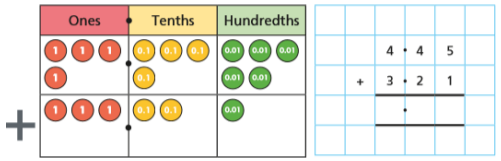
24.27 + 7.58 = 31.85





Adding decimals with the same number of decimal places

Pictures are used to support column addition.



	0	.	8	1	7
+	0	.	3	5	4
	1	.	1	7	1
	1			1	

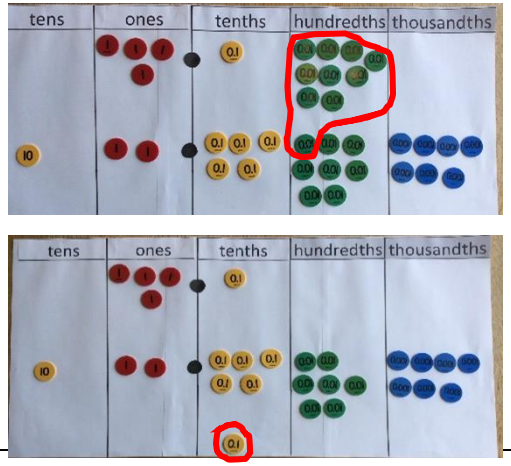
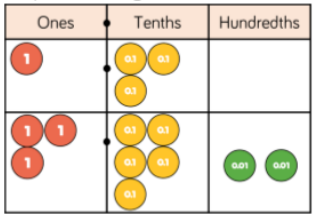
Click here for a video

Adding decimals with the same number of decimal places.

Place value column headings support placing the digits in the correct columns.

	T	O	.	t	h
	2	4	.	2	7
+		7	.	5	8
	3	1	.	8	5
	1			1	

Adding numbers with a different number of decimal places.

	Adding numbers with a different number of decimal places. 4.19 + 12.585 = 16.777  	**Adding numbers with a different number of decimal places.** Pictorial representations support column addition.  1 . 3 + 3 . 5 2	The addition of zeros in the empty place value columns can support understanding. T O . t h th 4 . 1 9 0 + 1 2 . 5 8 7 1 6 . 7 7 7 1

Year 6

Children consolidate their knowledge of column addition. They work with larger numbers, more numbers and decimals. They consider whether column addition is the most efficient method e.g. when adding 998 it is easier to add 1000 and then subtract 2.