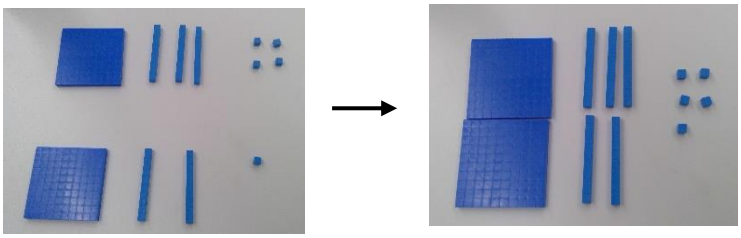
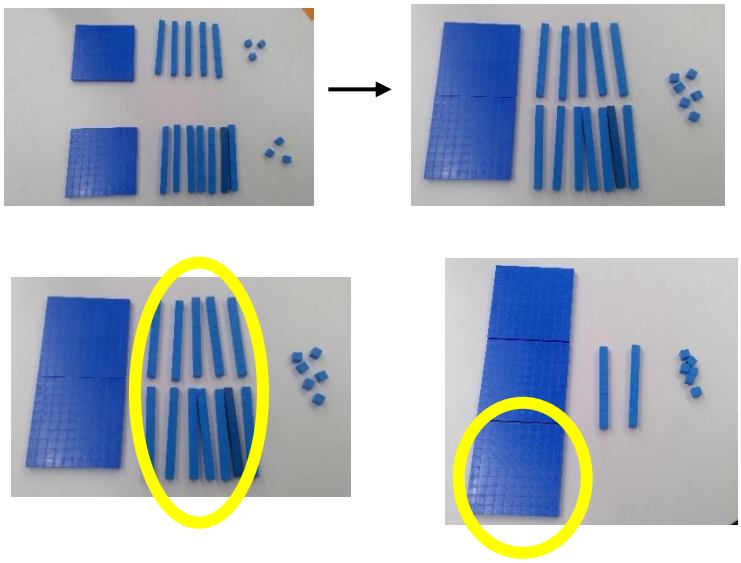
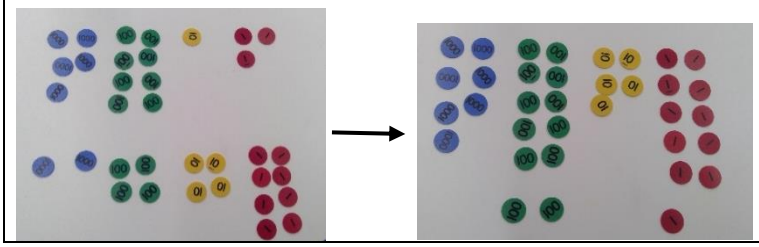
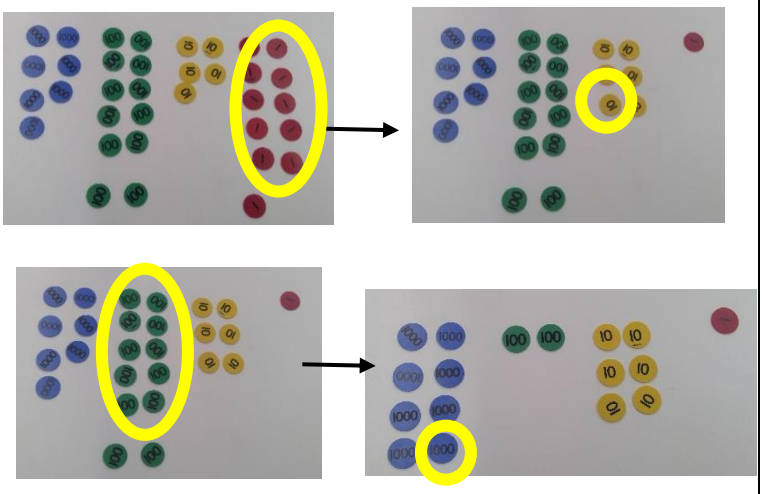
Fair Oak Junior School Calculation Policy (addition and subtraction)

Progression with formal methods for addition and subtraction

Addition

What the method looks like	Language used to teach it
Use of dienes to partition and add numbers without exchanging 	• The calculation is 234 + 221 • We make the addends (234 and 221) • We combine the addends • Add the ones, tens and hundreds together • We have a sum of 225
Use of dienes to partition and add numbers with exchange 	• The calculation I 253 + 273 • We make the addends (253 and 273) • We combine the addends; add the ones, tens and hundreds • We have 12 tens so we exchange ten tens for one hundred • We have a sum of 326
Use of place value counters to partition and add with exchange Using place value counters is easier with larger numbers however children need to have a good understanding of numbers as, opposed to dienes, the counters are the same size but represent different values. 	• The calculation is 5,813 + 2,448. • Make the addends • Combine the addends • Exchange ten ones for one ten • Exchange ten hundred for one thousand • We have a sum of 8,261

<table>
<tr>
<td>  </td>
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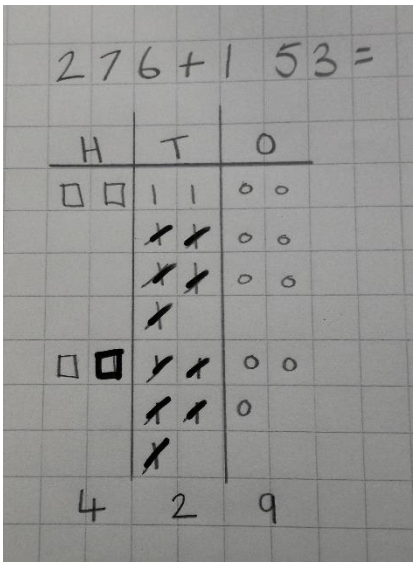
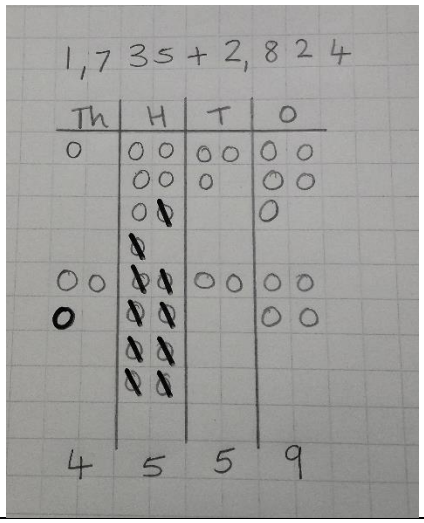
<td><u>Pictorally drawing dienes/ place value counters to partition and add with exchange.</u>
 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Draw the place value columns 2 squares wide
Draw the addends (for dienes - use a square for a hundred, line for a ten and circle for a one – crosses for ones mean the children can’t see when they have been crossed out)
For place value counters, use circles to represent these
Start in the ones, then move left through the columns adding the numbers
If there are ten or more exchange ten for one e.g. exchange ten ones for one ten
Do the exchanging in a different colour (purple pen)
We have the sum

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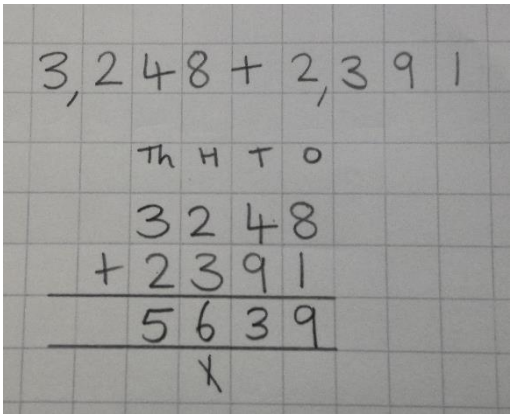
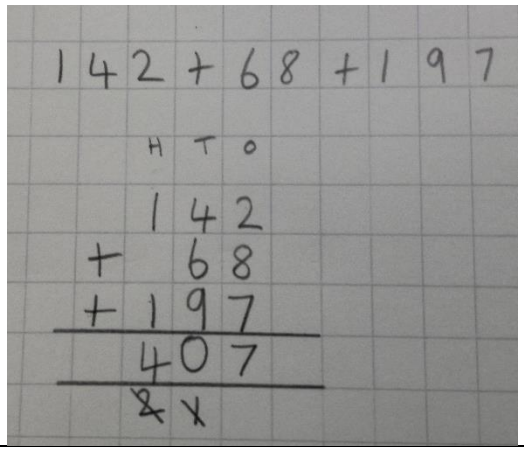
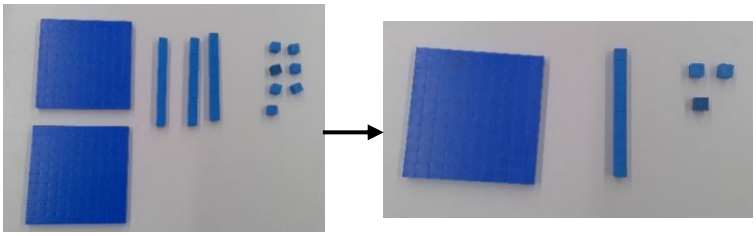
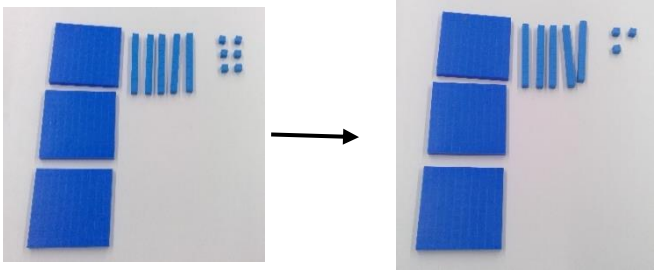
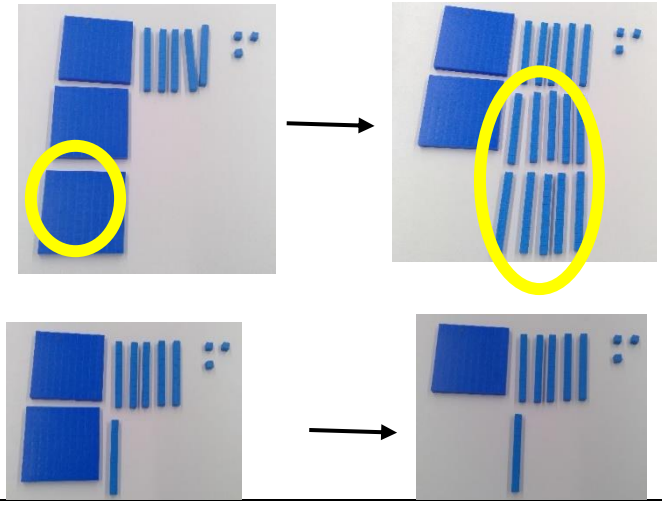
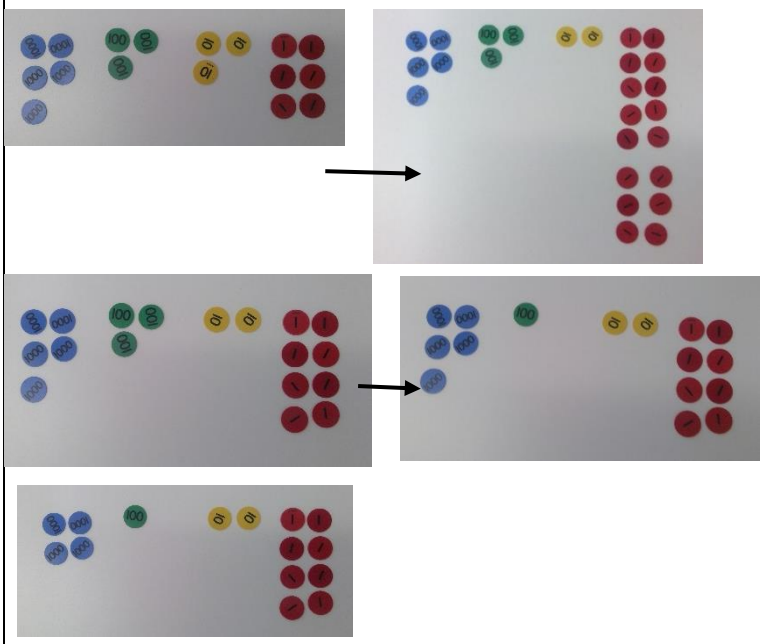
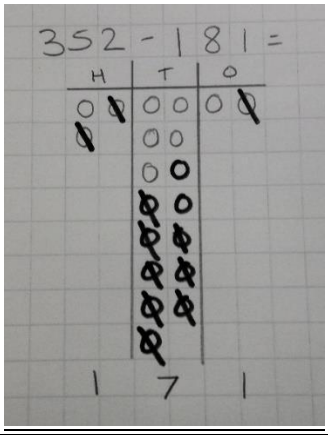
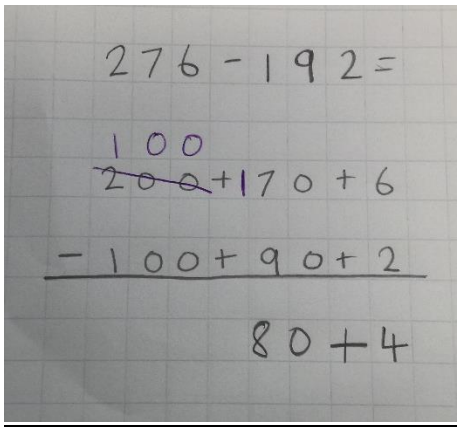
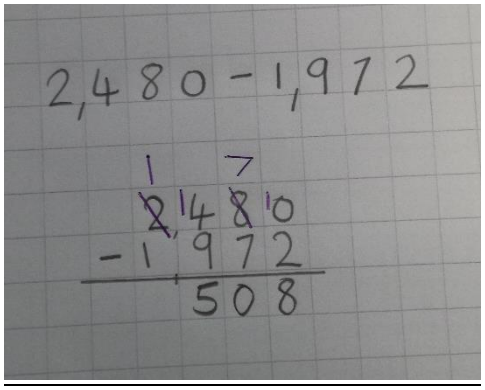
Use the column method to add numbers   	• If needed, draw the place value columns • Write out the numbers in the correct columns (lined up appropriately) • Start in the ones (or the smallest value column e.g. if adding decimals) • If there is no exchange, we add the numbers 8 ones and 1 one is 9 ones • If there is exchange, we would say 4 tens and 9 tens is 13 tens. Ten tens exchanges for one hundred. We have 3 tens remaining. • The exchanges go underneath the calculation and are crossed off when they have been counted.

Subtraction

What the method looks like	Language used to teach it
Use of dienes to partition and subtract 	• The calculation is 237 (minuend) – 124 (subtrahend). • We make the minuend (237) • We subtract the ones, then tens, then hundreds. • We are left with 113 which is the difference
Use of dienes to partition and subtract with exchange 	• The calculation is 356 – 193 • We make the minuend (356) • We subtract the ones • If there is not enough hundreds, tens or ones we would need to exchange • For this calculation, we need to exchange one hundred for ten tens

	• We can then subtract the tens and hundreds • We are left with the difference of 163
<u>Use of place value counters to partition and subtract with exchange</u> 	• The calculation is 5,336 – 1,208 • We make the minuend (5,336) • We subtract the ones, tens, hundreds • If there is not enough ones/ tens/ hundreds, we need to exchange • We exchange one ten for ten ones • Then we can subtract the ones • We are left with a difference of 4,128
<u>Pictorially use dienes/ place value counters to solve subtraction with exchange</u> 	• The calculation is 352 – 181 • We make the minuend • We subtract the ones, tens then hundreds • If we do not have enough in a place value column we exchange • For example we exchange one hundred for ten tens. Now we have 15 tens and we can subtract 8 tens. • We have subtracted the subtrahend and we are left with a difference of 171

Expanded column method  This is an additional step that not all children will need. For some children they will need to see how the number is partitioned into hundreds, tens and ones rather that going straight to the column method where one digit represents a 3-digit number.	• The calculation is 276 – 192 • We partition the minuend into hundreds, tens and ones • We partition the minuend into hundreds, tens and ones • We subtract 2 ones from 6 ones • We can't subtract 90 from 70 so we exchange. • We take one of our hundreds and add this to our tens. • We then subtract 90 from 170 • We subtract 100 from 100 which gives us 0 • We are left with the difference of 80 + 4 which = 84
Column method  	• The calculation is 2,480 – 1,972 • We write out our minuend (2,480) – our subtrahend (1,972) • We can't subtract 2 ones from 0 ones so we need to exchange • We exchange one ten for ten ones. We now have 10 – 2 • We subtract the tens, hundreds and thousands, exchanging when needed • We are left with the difference of 508