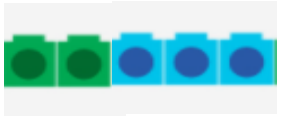
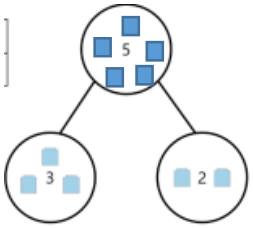
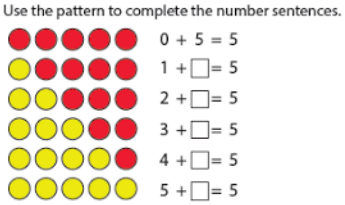
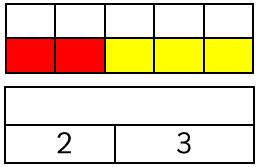
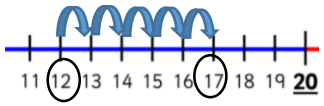
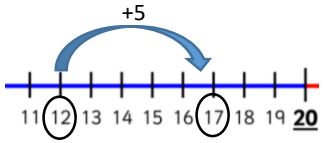
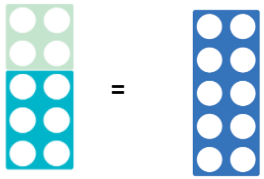
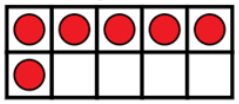
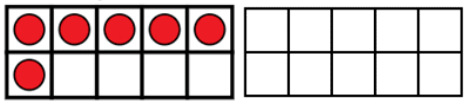
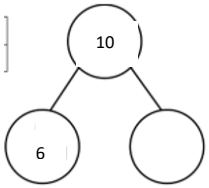
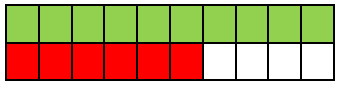
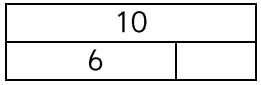
Maths Methods and Representations - Addition

Strategies	Concrete	Pictorial	Abstract
Combining 2 groups (numbers) to make a whole (total)	 Tens frames and counters  A range of practical resources  Part- part whole models used with concrete resources. The two 'parts' at the bottom add together to make the 'whole' number at the top. This can be used to find different pairs of numbers that make the 'whole' number.	  **Part-part whole models-** Made up of the 'whole' number at the top, and the two 'parts' at the bottom. This can be used to find different pairs of numbers that make the 'whole' number. **Bar models** 	$2 + 3 = 5$ Problem solving- There are 2 children on the bus, another 3 children get on. How many children are on the bus now?
Counting on- Start at the biggest number and count on (introducing the idea that addition can be done in any order)	 Bead strings (12 + 5 =) Start with the larger number on the bead string and then count on the smaller number, one at a time.	Structured number lines (12 + 5 =) Begin by jumping in steps of one- start with the larger number  **Progress to jumps of all the ones:** 	Children should also begin to understand that addition can be done in any order (commutativity) So if they know that; $12 + 5 = 17$ They should also know that; $5 + 12 = 17$

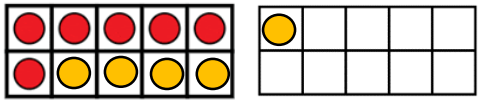
Maths Methods and Representations - Addition

<table>
<tr>
<td>Number bonds of 10 and 20

Applying knowledge of number bonds of 10 to find number bonds of 20

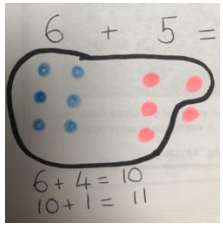
Missing number problems</td>
<td>Numicon
 
6 + ☐ = 10
 
How many more to make 10?
What about 20? 6 + ☐ = 20
  </td>
<td> 
Part-part whole models -
Finding the missing ‘part’ to make the ‘whole’
 
Bar models
  </td>
<td>If you know that
6 + 4 = 10
Then you also know that
4 + 6 = 10

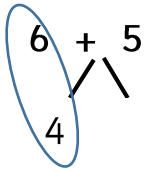
If you know that
6 + 4 = 10
Then you also know that
16 + 4 = 20
4 + 16 = 20

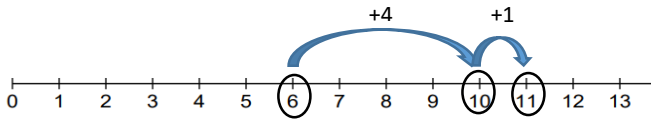
<u>Problem solving:</u>
There are 10 children in class today. There are 6 girls. How many boys are there?</td>
</tr>
<tr>
<td>Regrouping to make 10-
To move on from the previous strategy (counting on in ones) children are encouraged to use their number bond knowledge and bridge through 10
e.g. if 6 + 4 = 10, so 6 + 5 must equal 11.</td>
<td> 
6 + 5 =_____

Pupils use knowlegde of number bonds of 10.

Start with 6. I need 4 more to make 10, then 1 more makes 11</td>
<td>6 + 5 =

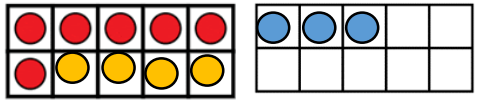
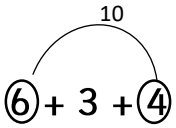
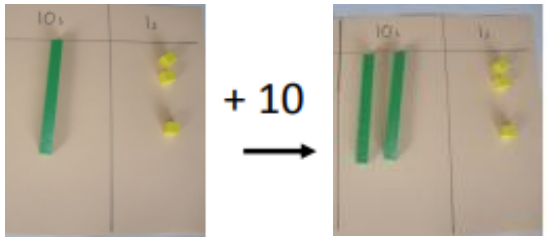
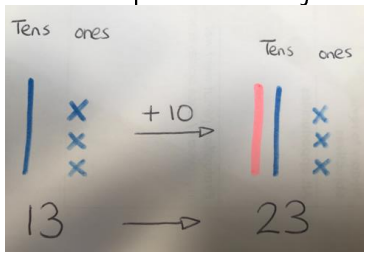
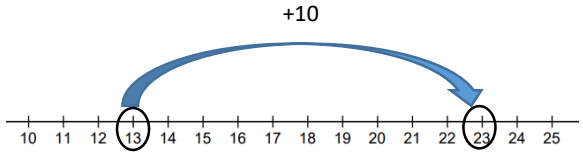
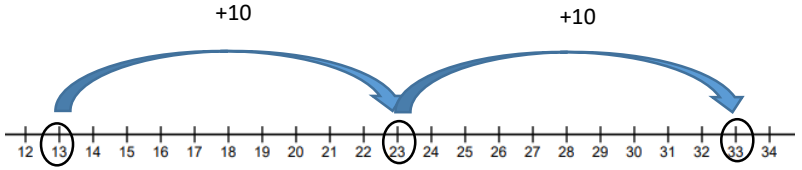
Use pictures or a number line.
Regroup or partition the smaller number to make 10
 

Pupils use knowlegde of number bonds of 10.
Make 10, then how many more?
6 + 4 = 10
10 + 1 = 11
 
</td>
<td>6 + _____ = 11

I am at 6. How many to get to 10? Then how many more?</td>
</tr>
</table>

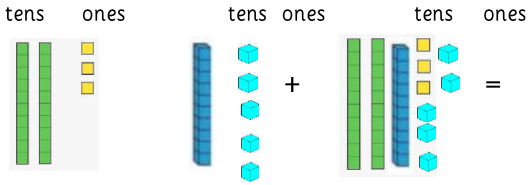
Maths Methods and Representations - Addition

<table>
<tr>
<td>Adding 3 single digit numbers – using and applying known number facts including number bonds and doubles</td>
<td> 
Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit
6 + 3 + 4 =
 
6 and 4 makes 10. Add the 3 makes 13
  </td>
<td> 
6 + 3 + 4 = 13</td>
<td> 
10 + 3 = 13
I know that 6 + 4 makes 10. Then 3 more is 13</td>
</tr>
<tr>
<td>Adding 10 and multiples of 10/ understanding how the digits change</td>
<td> 
+ 10</td>
<td>Pictorial representation of tens and the ones- adding 10 more.
 
Structured number lines
 
Adding multiples of 10 on structured number lines
  </td>
<td>13 + 10 = _____
13 + _____ = 23
10 more than 13 is _____
23 is 10 more than _____
Problem solving:
There are 13 birds in the tree. Another 10 join them. How many birds are in the tree now?</td>
</tr>
</table>

Maths Methods and Representations - Addition

Adding two-digit numbers by partitioning

23 + 15 =



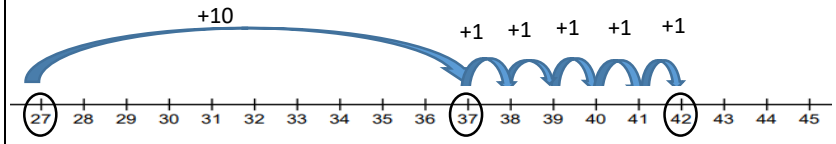
Combine all of the tens and all of the ones to find the total.

Begin with jumps of tens and ones

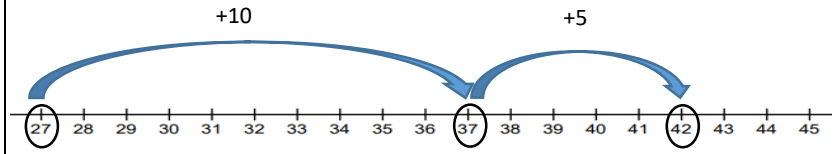
27 + 15 =

10 5

Structured number lines

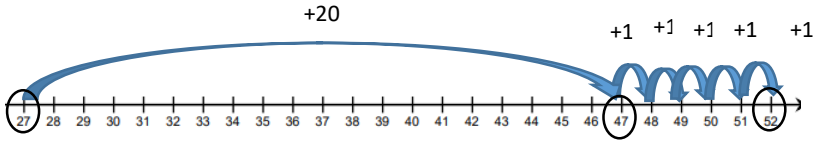


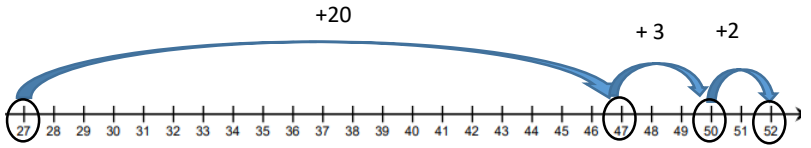
Progress to jumps of all the tens and all the ones



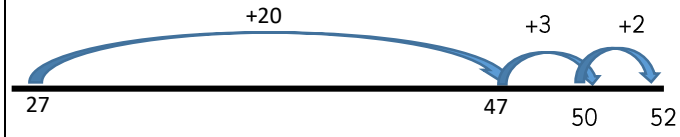
27 + 25 =

20 5





Then move to unstructured number lines:



27 + 25 =

20 5

Add the tens:

20 + 20 = 40

Add the ones:

7 + 5 = 12

40 + 12 = 52

Maths Methods and Representations - Addition