

Year 2 -

Bridging in addition and subtraction

Bridging through 10 is a technique used to add or subtract two numbers where the total is greater than 10 e.g. 7 and 8.

It draws upon key foundational concepts explored in Year 1 to help children develop foundational addition skills, including number bonds to 10 and the value of numbers within 10 (the six'ness' of six for instance).



Year 2 -

Bridging in addition and subtraction

In Year 2, the end of year expectation is that children will add and subtract two 2-digit numbers, bridging 10.

This means that by the end of the year, all children should be able to calculate:

$$57 + 28$$

$$43 - 27$$



Year 2 -

Bridging in addition and subtraction

"My Mummy/Daddy/tutor have taught me column addition, I'll just use that..."

This is something we hear a lot as Year 2 teachers. Ultimately, we agree that column addition is a far more efficient method than bridging, which is why we complete our learning journey by teaching it, but it does not serve to embed the process of adding, using prior knowledge, for some children in the same way that bridging does.

Moreover, we find that the ability to reason ideas and solve problems is limited in those children that have a reliance on using the column method. Therefore, understanding the foundational concepts involved in addition and subtraction is imperative to avoid reasoned answer like, "I know because I worked it out".



Year 2 -

Bridging in addition and subtraction

Which of the following is easier to calculate?

$$57 + 28 =$$

$$80 + 5 =$$

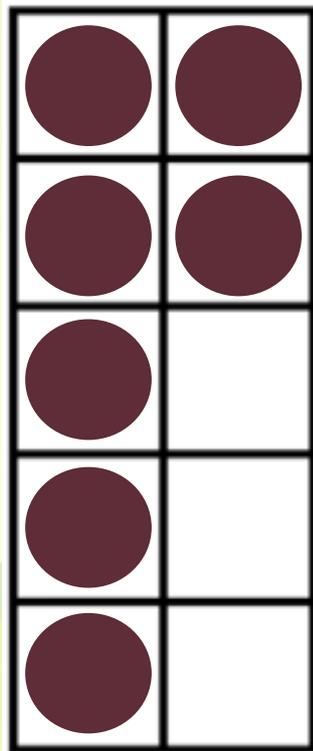
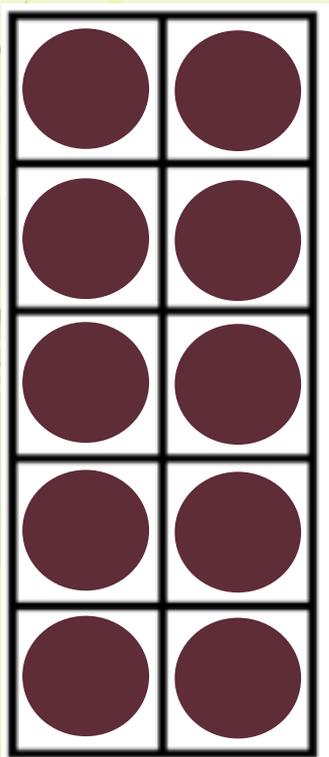
Provided children are secure in the concept of 10 and their number bonds to 10, they should have the necessary learning to enable them to manipulate any calculation into the second calculation here.

At Barrow Hedges, in maths, we work from **concrete**
> pictorial > abstract representations.

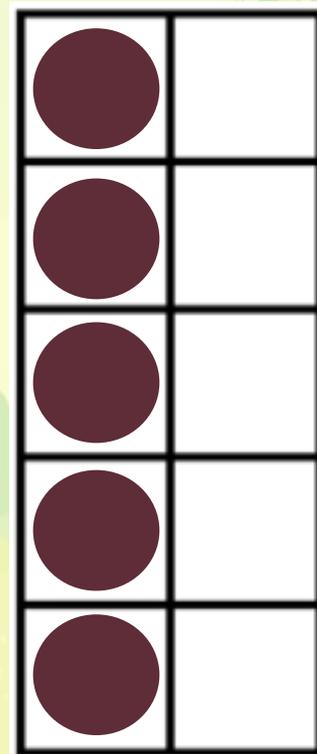
Step 1 - 2 digit + 1 digit

$$17 + 5 = 22$$

3 2



+

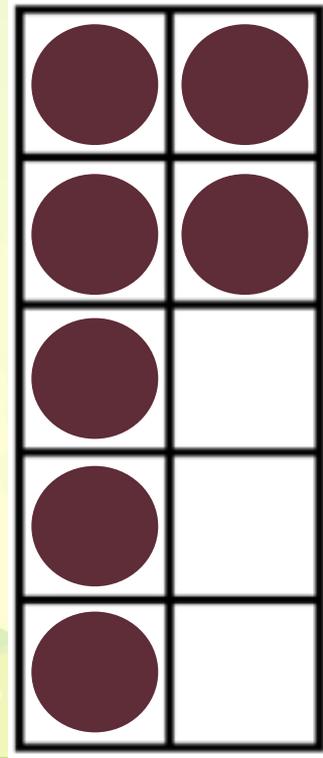
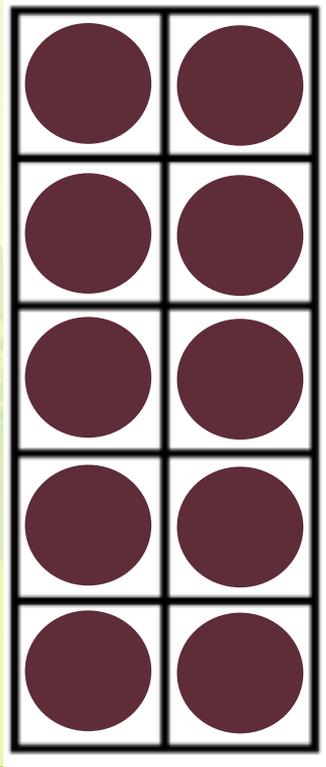
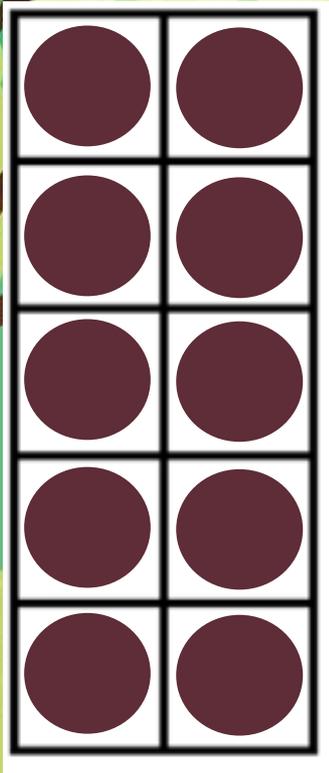


Procedural variation enables the child to see this similar calculation with different multiples of 10.

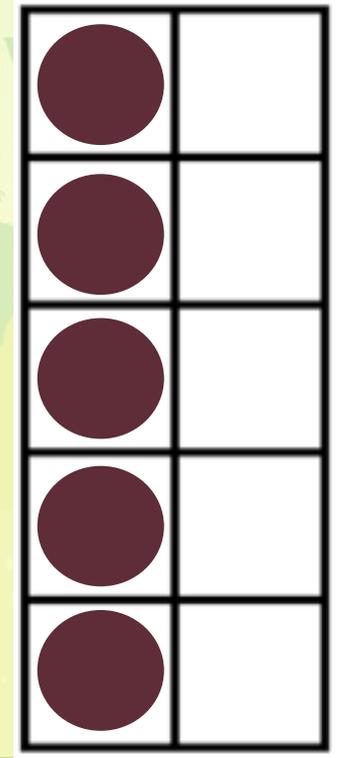
Step 1 - 2 digit + 1 digit

$$27 + 5 = 32$$

A red arrow points from the 7 in 27 to the 3 in 32. Two blue lines branch from the 5 in 5 to the 2 in 32.



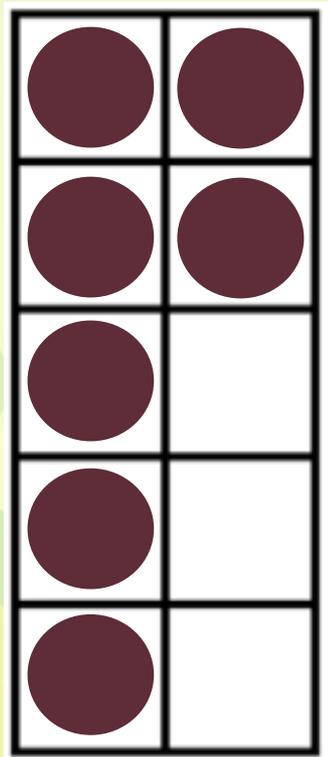
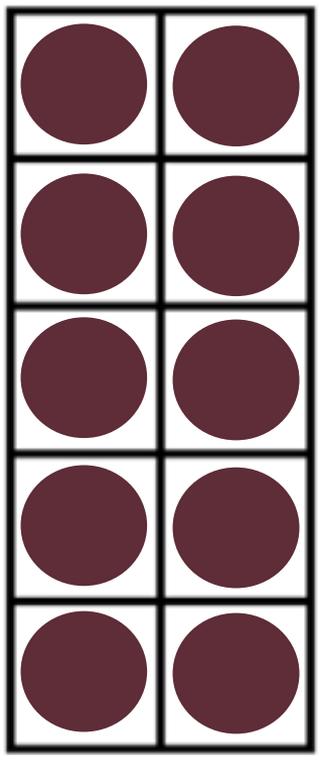
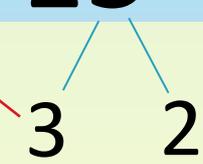
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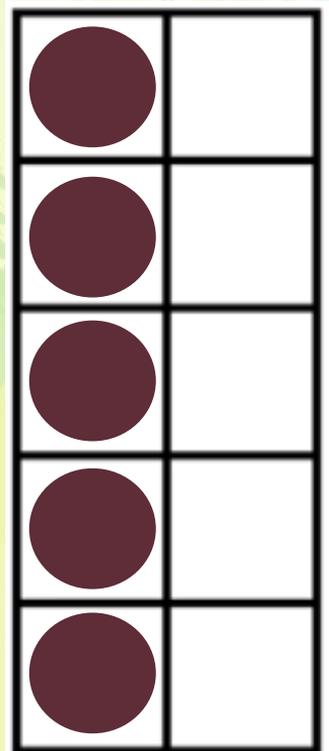
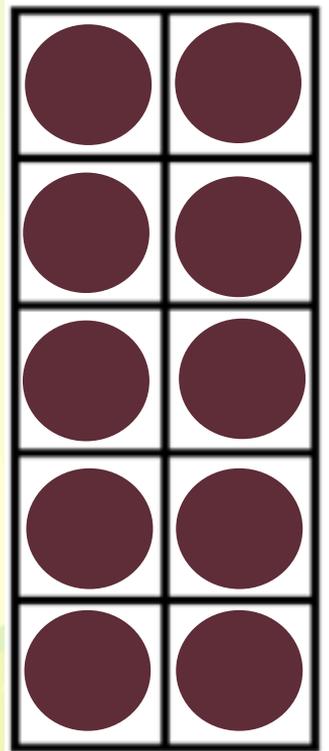
Procedural variation enables the child to see this similar calculation with different multiples of 10.

Step 2 - 2 digit + 2 digit

$$17 + 15 = 32$$



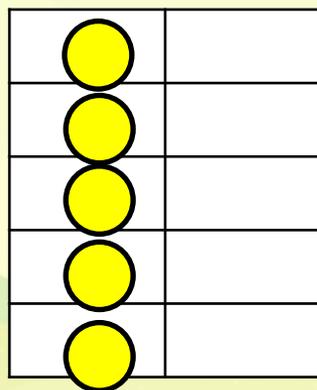
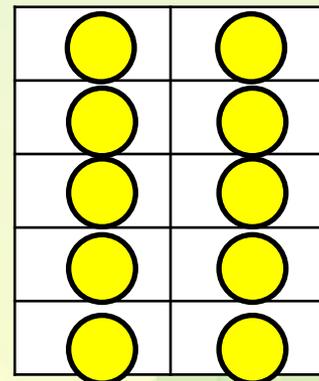
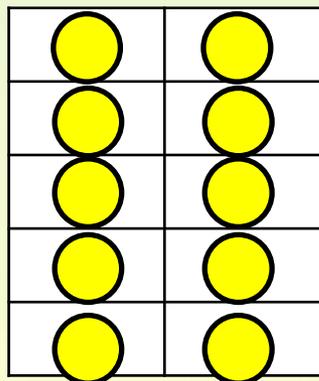
+



When subtracting, children can use double sided counters to help when subtracting their bridging amounts.

$$25 - 8 =$$

5 3



First I would take my 5 so that I am left with 20.
Then I take the ones I have left!
Here I have 3 ones left to take because $5 + 3 = 8$

Procedural variation enables the child to see this similar calculation with different multiples of 10.

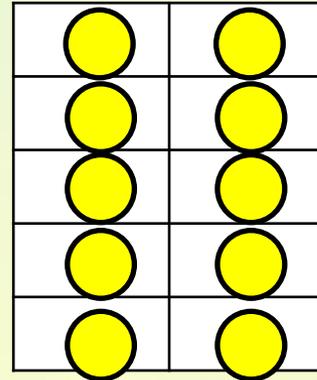
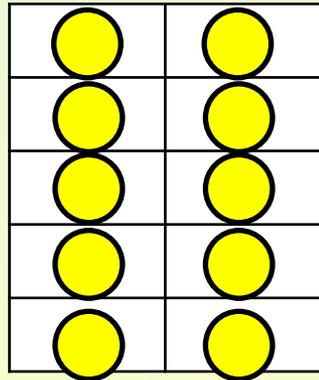
$$25 - 18 =$$

$$\begin{array}{r} 10 \\ 25 - 18 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 8 \\ 25 - 18 \\ \hline 8 \end{array}$$

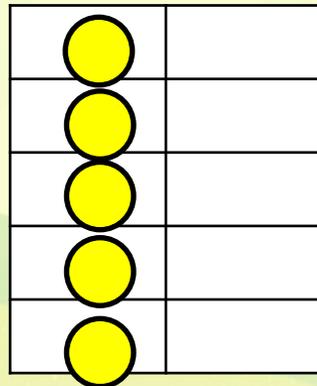
$$\begin{array}{r} 5 \\ 25 - 18 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 3 \\ 25 - 18 \\ \hline 3 \end{array}$$



First I would partition the number I am subtracting.

Now I can take away my tens.

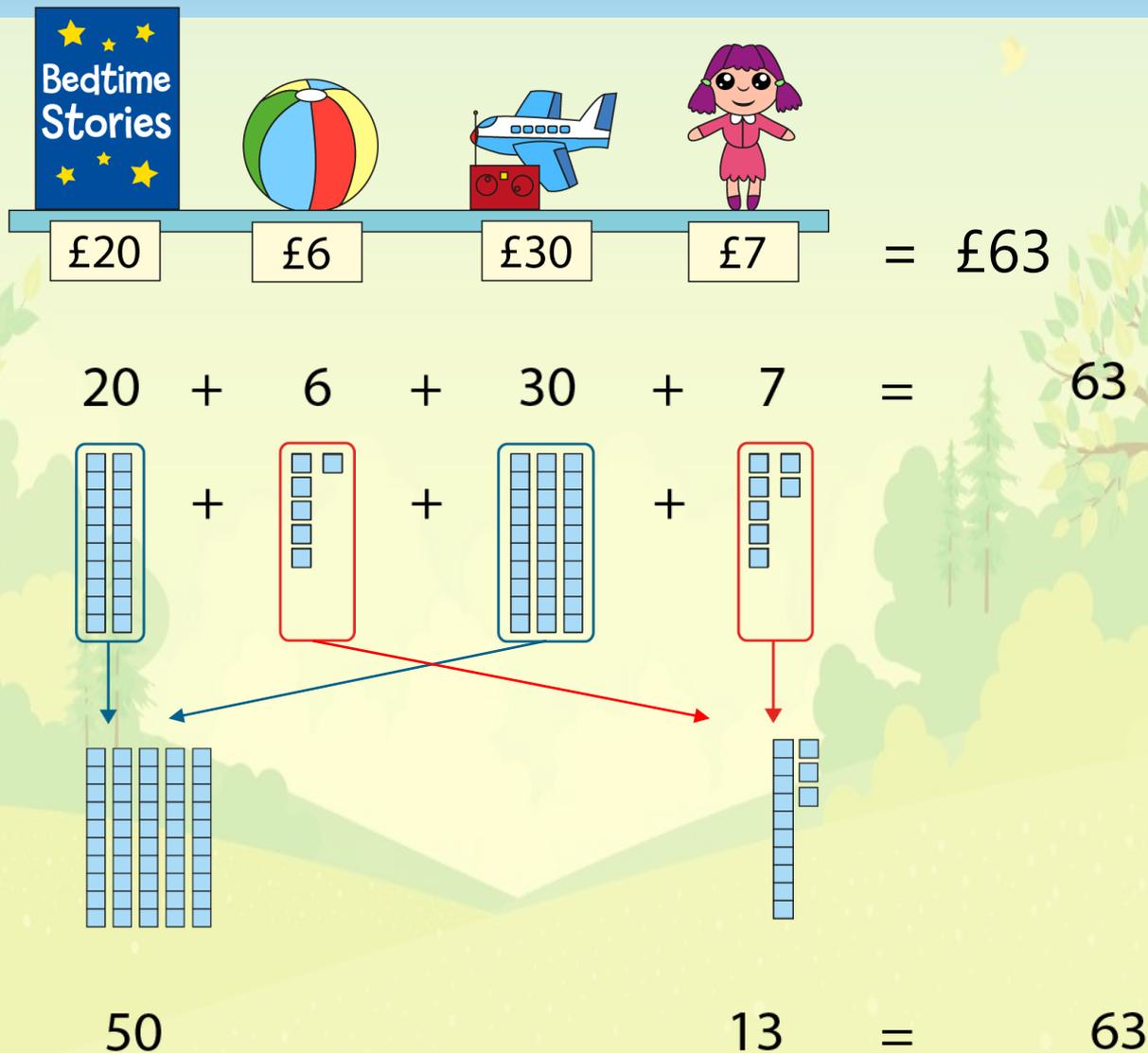


Then I take the ones like I did before. First we bridge to the ten then take the rest.

Here I have 3 ones left to take because $5 + 3 = 8$

Dienes provide an excellent concrete resource and can quickly become jottings for children to use too.

2 digit + 2 digit



Adding tens together first enables the child to focus on bridging the new tens value only worrying about teens numbers.

2 digit + 2 digit



= £63

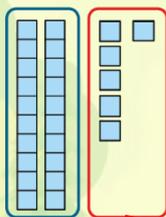
26

+

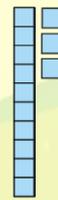
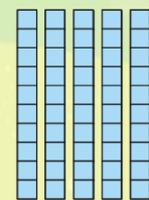
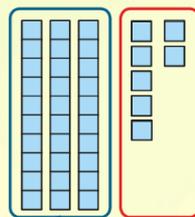
37

=

63



+



50

+

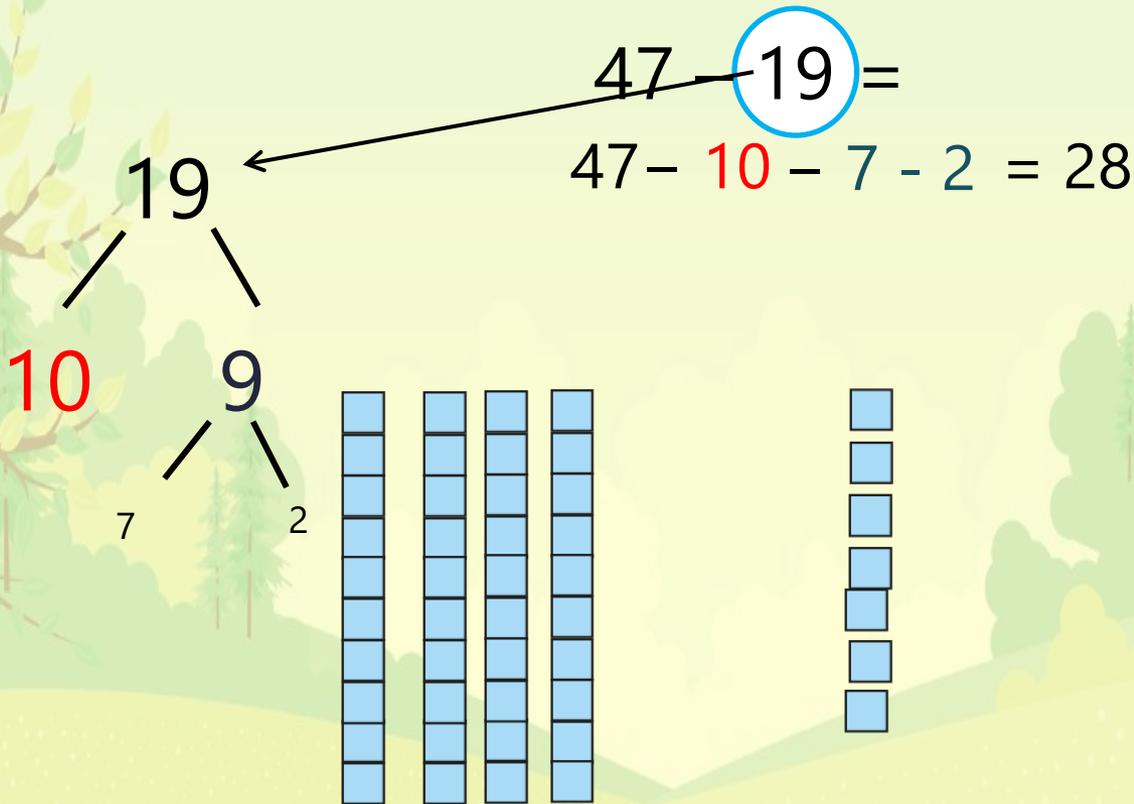
13

=

63

Dienes can again support the learning here and are particularly helpful in understanding the exchange of one ten into ten ones.

2 digit - 2 digit



Blank numberlines provide a way for children to demonstrate their understanding of bridging and is a preferred method for many.

2 digit + 2 digit

$$26 + 37 = 26 + 30 + 7 = 63$$

4 3

+ 30

+ 7

26

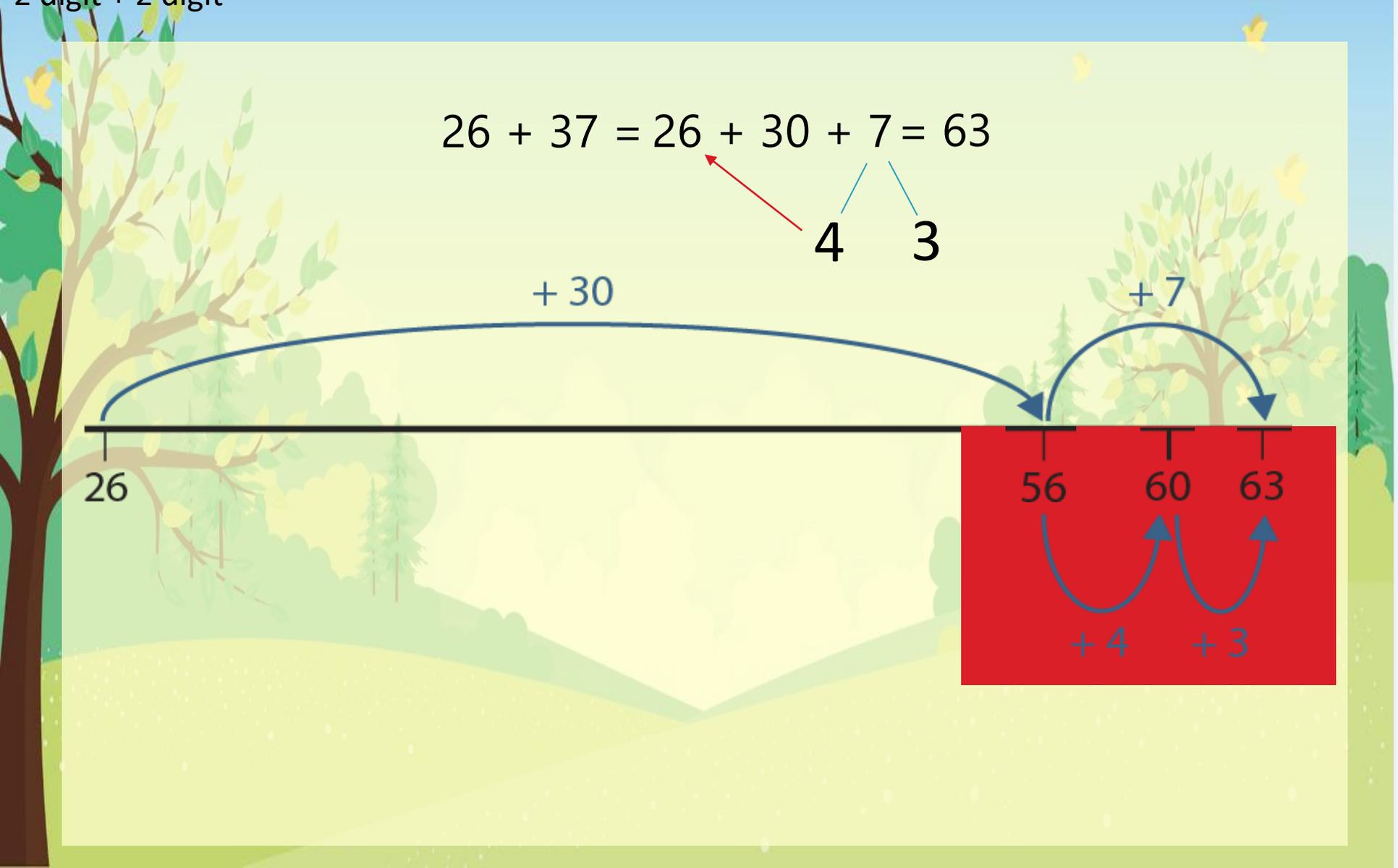
56

60

63

+ 4

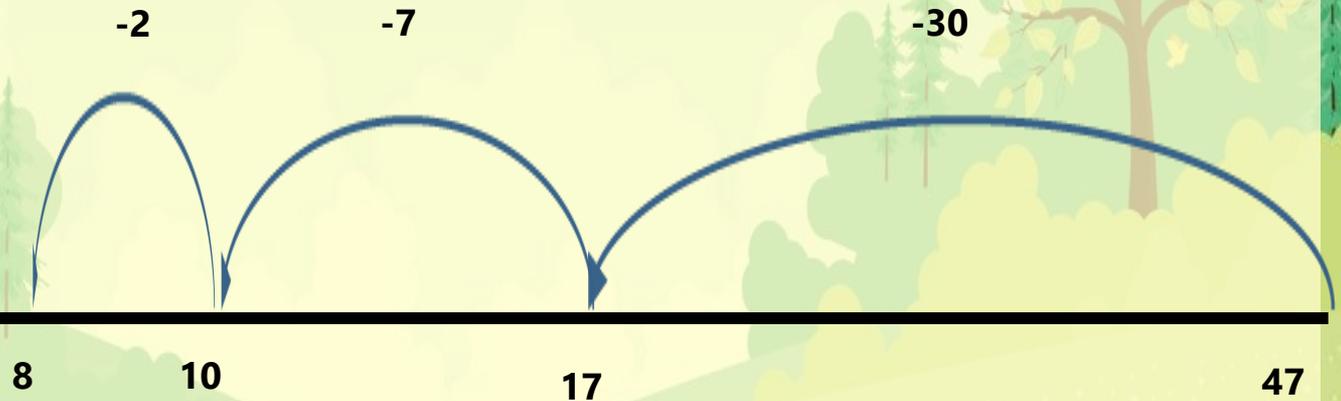
+ 3



Can you explain how I would approach subtraction using bridging on the blank numberline.

2 digit - 2 digit

$$47 - 39 = 8$$



Your turn... Can you use dienes as jottings and a blank numberline to demonstrate how the following are calculated?

$$35 + 37 =$$

$$64 - 27 =$$

$$17 + 69 =$$

$$47 - 18 =$$

FAQ – Why do you add the 10s first when you must add the 1s first in formal methods.

That's your column addition mind ruling your thoughts!
Children must learn to manipulate number in a range of ways to fully understand it.

Any questions?