Expanded sums

Activity 1

Focus of activity: Using expanded column addition to add pairs of 3-digit numbers (one 'carry').

Working together: conceptual understanding

- Show children how we can use expanded column addition to work out 458 + 224. *First, we partition each number.* Point out how we leave a line below the two numbers in case there are any extra 10s or 100s which we need to add to the other 10s and 100s.

```
  400   50   8
+ 200   20   4
        10
-------------
  600   80   2   682
```

- Talk through the steps as you do so: *8 and 4 is 12, which is one 10 and two 1s. We write 2 in the 1s column and 10 in the 10s column, ready to be added to the other 10s. We have 50, 20 and 10, which is 80 altogether. We write 80 in the 10s column. Now we add the 100s. 400 and 200 gives 600 altogether. What is the answer to the whole sum?* Make sure that children realise that the final stage is to add 600, 80 and 2, using place value.
- Ask children to use expanded addition to work out 527 + 317. Do they get the same answer?
- Use expanded addition to work out 473 + 264. Point out that the 10s come to more than 100 this time, so we write 30 in the 10s column and 100 under the 100s ready to be added to the other 100s.

```
  400   70   3
+ 200   60   4
  100
-------------
  700   30   7   737
```

- Now ask children to use expanded addition to work out 481 + 243. Do they get the same answer?

Up for a challenge?

Ask children to identify the missing numbers in the following sum – use Post-its™ to hide the mystery numbers.

```
  400   ▢    7
+  ▢    30   8
        10
-------------
  800   70   5   875
```

Now it's the children's turn:

- Children practise using expanded addition to add pairs of 3-digit numbers, first where the 1s come to more than 10 and then where the 1s come to more than 100.
- Go round the group and mark their additions as they do them, e.g. initially after two examples.

S-t-r-e-t-c-h:

If children cope well, ask them to work out the answer to 367 + 275 where the 1s come to more than 10 and the 10s come to more than 100.

Things to remember

Remember that we need to leave a line after the two numbers we are adding in case there are extra 10s or 100s that we need to write there, ready to add to the other 10s and 100s. Ask a child to be 'teacher' and talk through the steps in one of their additions.

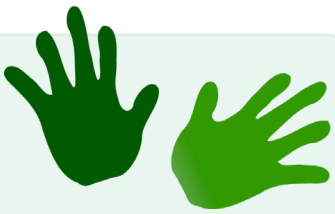
You may want to add something that has emerged from the activity. This may refer to misconceptions or mistakes made.

Resources	**Outcomes**
• Mini whiteboards • Post-it™ notes	1. Children can use expanded column addition to add pairs of three-digit numbers where the 1s are greater than 10, or the 10s are greater than 100. 2. Children begin to use expanded column addition to add pairs of three-digit numbers where the 1s are greater than 10 and the 10s are greater than 100.

Expanded sums
Activity 1

Work in pairs

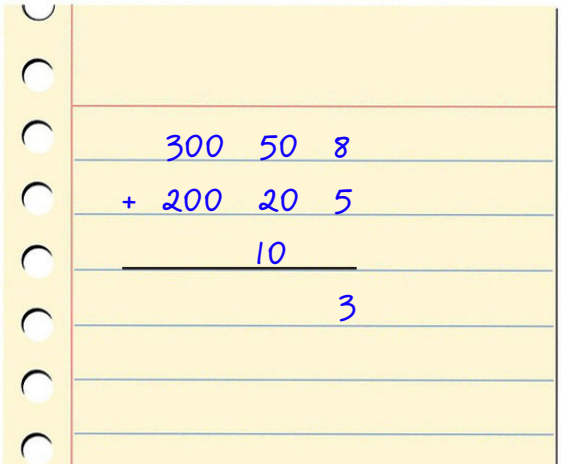
Things you will need:
- A pencil



What to do:

- Use expanded column addition to work out the answers to at least two additions in each column.

358 + 225	482 + 241
517 + 234	565 + 253
625 + 247	372 + 281
549 + 126	293 + 174



S-t-r-e-t-c-h:
Work out the answer to 367 + 275. This time the 1s come to more than 10 and the 10s come to more than 100.

Learning outcomes:
- I can use expanded column addition to add pairs of three-digit numbers where the 1s are greater than 10, or the 10s are greater than 100.
- I am beginning to use expanded column addition to add pairs of three-digit numbers where the 1s are greater than 10 and the 10s are greater than 100.

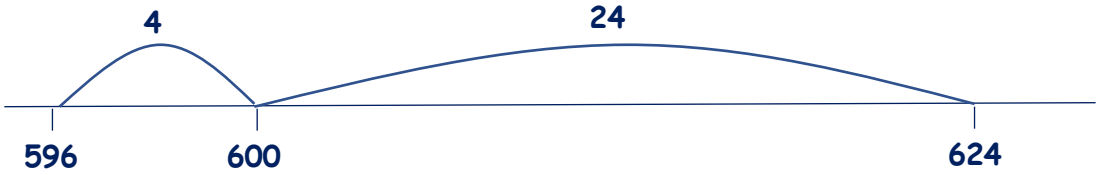
Hops and jumps

Activity 2

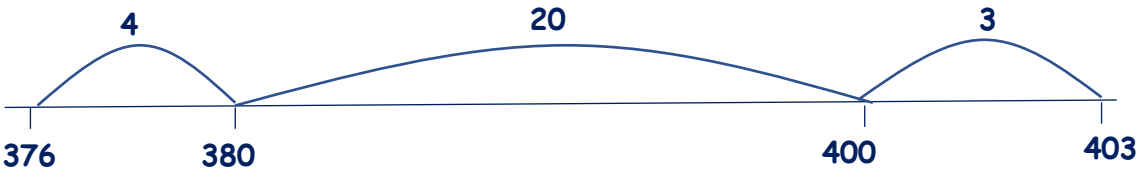
Focus of activity: Subtract numbers either side of a multiple of 100 using Frog, e.g. 624 – 596, 403 – 376 and 512 – 487.

Working together: conceptual understanding

- Write the following subtractions on the flipchart: 624 – 596, 403 – 376 and 512 – 487. Point out that in each subtraction the two numbers lie either side of a multiple of 100.
- Explain that you are going to use Frog (counting up) to work out the answer to each. Point to the first. *Where will Frog start and where is he aiming to get to?*
- Draw a line from 596 to 624. *Which 100s number is between these two numbers? Where will Frog hop to first?* Agree that Frog will hop to 600. Mark on 600 and ask a child to label the hop. *Where will Frog go to next?* Make sure that children realise that they can use place value to jump from 600 to six hundred AND twenty-four – the size of jump is 24! Ask children what Frog needs to do next – add up the hops.



- Repeat with 403 – 376. Point out that Frog has got further to go to get to the next 100 this time. Children can either do a big jump of 24 to get from 376, or a little hop to 380, then a jump from 380 to 400.



- Repeat with 512 – 487. Make sure children use place value to jump from 500 to 512.
- Look back over the three subtractions. Point out that we use number facts to help Frog to the next 100 (sometimes hopping to the next 10 first) and then place value to get from the next 100 to the bigger number.

Up for a challenge?

Challenge children to come up with their own subtractions of numbers either side of a multiple of 100. Share them and work some of them out.

Now it's the children's turn:

- Children practise using Frog to subtract pairs of 3-digit numbers, either side of a multiple of 100. They choose subtractions from each section, taking it in turns to be the teacher and 'teach' their partner (the Frog).
- Go round the group and mark their subtractions as they do them, e.g. after one from each section.

S-t-r-e-t-c-h:

If children cope well, ask them to choose two subtractions from the first section to check with addition.

Things to remember

Remember that Frog starts on the smaller number, and hops to the next 10 or 100. We can use place value to work out his jump from a multiple of 100 to the bigger number. We must remember to add up all the hops and jumps at the end or we will have done all that hard work and not worked out the answer to the subtraction! Ask a child to play the role of Frog's teacher and teach him how to work one of the subtractions they answered in their activity.

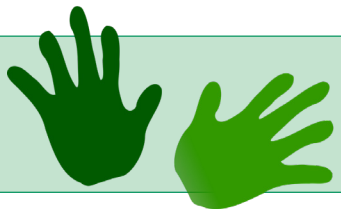
You may want to add something that has emerged from the activity. This may refer to misconceptions or mistakes made.

Resources	**Outcomes**
• Flipchart and pens	1. Children can use counting up (Frog) to subtract 3-digit numbers either side of a multiple of 100, e.g. 624 – 596, 403 – 376 and 512 – 487. 2. Children begin to use addition to check subtraction.

Hops and jumps
Activity 2

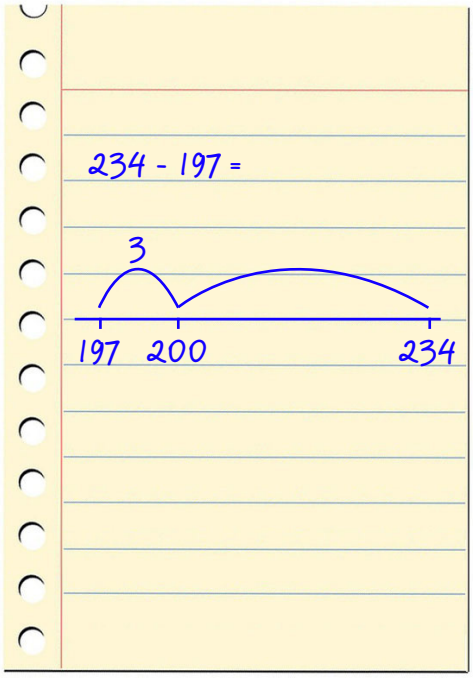
Work in pairs

Things you will need:
- A pencil



What to do:

- Take it in turns to be the teacher and to be the Frog. Choose a subtraction. Tell your partner, one step at a time, how to work out the answer to the subtraction.
- Work out as many subtractions as you can. Make sure you include at least one from each section.



Hop, jump
234 – 197
815 – 798
623 – 595

Hop, jump, hop
504 – 479
803 – 785
901 – 768

Hop, jump, jump
412 – 367
821 – 782
732 – 676

S-t-r-e-t-c-h:
Choose two subtractions to check using addition.

Learning outcomes:
- I can use counting up (Frog) to subtract 3-digit numbers either side of a multiple of 100.
- I am beginning to use addition to check subtraction.