KNOWLEDGE CHECK

MENTAL CALCULATIONS, ADDING LISTS

You should be able mentally and speedily to add lists of numbers such as those in this knowledge check, without recourse to a calculator or a formal written method.

a) A pupil's marks out of 10 in ten weekly tests are: 7, 6, 8, 5, 9, 6, 5, 4, 3, 6. What is the pupil's total mark out of 100?

b) The numbers of pupils in the classes of a primary school are 18, 25, 26, 29, 31, 28 and 27. How many pupils altogether in the school?

Haylock, *Numeracy for Teaching*, SAGE Publications Ltd, London. © Derek Haylock 2001

ANSWERS TO KNOWLEDGE CHECK 2

a) 59. b) 184.

DISCUSSION AND EXPLANATION OF KNOWLEDGE CHECK 2

When adding lists of single-digit numbers, a useful technique is to scan the list and to spot pairs that add up to 10. Also, look for a number that will make your current total up to the next multiple of 10. You may need to use a pencil to score through the numbers you have used, so that you don't count them twice.

For example, in (a) as I worked along the list, I started with 7 + 6 = 13, then 13 + 8 = 21. I then spotted that there was a 9 coming up, which would very handily take me up to 30, the next multiple of 10. I then spotted a couple of 5s(another 10) and a 6 and a 4 (another 10), bringing me to a total of 50, with just the final 3 and 6 to add on. Teachers often have to add strings of numbers like these. The numerate teacher will not need a calculator for this task, but will race through the addition at high speed. If that does not describe you yet, then note the techniques recommended here and practise!

When it comes to adding strings of two-digit numbers mentally, in contrast to formal written methods, most of us prefer to handle the tens first. Then, extending the strategies above, we will particularly be on the look-out for any pairs that add to a multiple of 10. For example, in (b) your eye might immediately light upon the 29 and the 31, which conveniently sum to 60. I found myself starting from here, then adding on the tens from the remaining classes, for some reason working from right to left: 60 + 20 = 80, 80 + 20 = 100, 100+ 20 = 120, 120 + 20 = 140, 140 + 10 = 150. I jotted this down. I was then left with the remaining units: 8, 5, 6, 8, 7. The 8 and 5 give 13, to which I added the 7 to get to 20. Then, adding on 6 and 8 (14) gave 34, which added to the 150 gave me 184 for the total.

Another mental technique is to add a number like 29 by adding 30 and then subtracting 1. Similarly, to add 28 you could add 30 and subtract 2. This process is sometimes called compensation: add a bit more than you need, then compensate.

Even if you do decide to write the string of numbers to be added in a vertical column with the hundreds, tens and units lined up, you should still use the techniques suggested for adding strings of single-digit numbers for getting the totals in each column.

Haylock, *Numeracy for Teaching*, SAGE Publications Ltd, London. © Derek Haylock 2001

SUMMARY OF KEY IDEAS

- When adding lists of single-digit numbers, scan the list and spot pairs that add up to 10.
- Also look for a number that will make your current total up to the next multiple of 10.
- Most people start with the tens digits when adding a string of two-digit numbers mentally.
- Look for pairs of numbers that make up a multiple of 10 (e.g. 43and 17).
- To add a number close to a multiple of 10 (e.g. 48 is nearly 50), you can add the multiple of 10 and then compensate (e.g. add 50 and subtract 2).

Haylock, *Numeracy for Teaching*, SAGE Publications Ltd, London. © Derek Haylock 2001

FURTHER PRACTICE

All you really need to do for further practice is to write out strings of one- and two-digit numbers and practise adding them accurately and speedily! I'll give you two examples to try. Allow yourself 30 seconds for each!

2.1 The numbers of unauthorised absences in a secondary school each day one month were:

9, 2, 5, 6, 12, 6, 7, 8, 1, 12, 9, 4, 5, 6, 9, 1, 2, 0, 8, 15, 3, 2.

What was the monthly total?

2.2 Add up the following marks achieved by a pupil in a series of mathematics tests:

43, 23, 27, 34, 49, 22, 21, 40, 36, 35.

Haylock, *Numeracy for Teaching*, SAGE Publications Ltd, London. © Derek Haylock 2001