The meeting

Annotation

Rachel uses an equal additions strategy to solve this problem. She looks for and finds that, with these two numbers, there is no obvious relationship that she can build upon. In her initial strategy she is carrying out two subtraction problems simultaneously. Rachel then quickly recognises an alternative and more efficient equal additions subtraction method.

Problem: The meeting

The teacher shows this problem to the student and reads it with her as required:

231 people said they would attend the meeting. 78 didn't show up. How many were at the meeting?

Student response

Rachel: I know it would be around 150 because I did an estimate. 231 is about 230, and 78 is about 80, so 231 – 78 is going to be about the same as 230 – 80. I did that by just looking at the tens and went 23 – 8, which is 15. So my estimate is about 150. It's actually 153.

Teacher: Tell me how you did that.

Rachel: I took away 31 from 231 and from 78 as well. That left 200 – 47. 200 – 50 would be 150, so it's 3 more. It's 153.

Teacher: What do you know that helped you?

Rachel: I know this isn't one of those neat and tidy problems. I've got to do it in bits of some kind.

Teacher: Tell me why you did it that way:

Rachel: Mmmm… actually it would've been easier if I'd added 22 to 78, and 22 to 231.That'd just be 253 - 100, which is 153.

Teacher: How would you record that?

Rachel: Yeah well it's kind of complicated to show all the bits so I'd probably just show the last one like this.

$$\begin{array}{r} 78 \\ +\ 22 \\ \hline \end{array} \qquad \begin{array}{r} 231 \\ +\ 22 \\ \hline \end{array}$$

$$253 - 100 = 153$$

Over the line

Annotation

Rangi solves this ‘change unknown’ addition problem, by using subtraction and thus applying an inverse operation to find the difference. He adds 15 to 185 to make 200, which he identifies as an easy number to operate with. He knows that to compensate for the addition to make an easy number he must also add 15 to the difference found. He readily recognises the more efficient strategy and works easily with these numbers.

Problem: Over the line

The teacher shows this problem to the student and reads it with him as required:

There were 472 runners altogether in the marathon. 185 have already crossed the finish line. How many are yet to complete the race?

Student response

Rangi: It’s 287.

Teacher: Tell me how you did that.

Rangi: I said 472 – 200 is 272 then I added 15 because I’d taken away 15 too many.

Teacher: What do you know that helped you?

Rangi: I know that I could have added to find the difference but it was quicker to find the difference by subtracting.

Teacher: Tell me why you did it that way.

Rangi: I could just see 15 more to make 200 so that was easy to subtract.

Teacher: How would you write that?

Rangi: Mmmmm..um... I suppose I’d just write what I did…like (he writes 472 – 200 = 272, 272 + 15 = 287) so there’s like 287 more runners to go.

472 - 200 = 272

272 + 15 = 287

DVD collections

Annotation

Sally responds to the numbers by choosing to use an algorithm. She can justify her choice and accurately explain her method. It is evident that Sally has a range of mental strategies.

Problem: DVD collections

The teacher shows this problem to the student and reads it with her as required:

Manu collects DVDs. She has 138 in one cabinet, 69 in another 34 in another. How many DVDs in Manu's total collection?

Student response

Sally: 241 DVDs.

Teacher: Tell me how you did that.

Sally: Actually I wrote it down like this because there wasn't a quick and easy way to do it in my head.
This is what I did.

$$\begin{array}{r} 138 \\ 69 \\ 34 \\ \hline 21 \\ 220 \\ \hline 241 \end{array}$$

Sally: That's the ones [pointing to 21]

That's the tens [pointing to 220] including that 13 there [pointing to 13]

Teacher: What do you know that helped you?

Sally: I know how to do the written form when you have to, but I usually try to do stuff in my head when I can. I also know when I see a number like 130 that's the same as 13 tens and that makes adding easier.

The ball dress

Annotation

Emma uses her place value knowledge of decimals to solve this addition problem. She adds the whole numbers first. Then she composes 1 and 1 tenth from 11 tenths, and adds this to her whole number sum. She understands the relationship between decimals and whole numbers. She also identifies, and can apply, an efficient rounding and compensating strategy.

Problem: The ball dress

The teacher shows this problem to the student and reads it with her as required:

It took 4.6 metres of patterned fabric and 2.5 metres of plain fabric to make a ball dress. How much fabric was used altogether to make the dress?

Student response

Emma: It's 7.1 metres. I just said 4 + 2 is 6, and .6 + .5 is 1.1. So It's 7.1.

Teacher: What do you know that helped you?

Emma: I know that often with decimals it's easier to add the whole numbers first. I also know that there are ten 10ths in one whole. I could also see straight away that it was going to be 7 and a little bit.

Teacher: Why did you do it that way?

Emma: Because using place value here makes sense but I could also have called that (4.6) 5 and that (2.5) 3, added 5 and 3 and then taken 0.9 from 8.

Teacher: How would you record that?

Emma: Well just 4 + 2 = 6 and 0.6 + 0.5 = 1.1 and 6 + 1.1 = 7.1. It's quite easy really.

$$4+2=6$$

$$0.6+0.5=1.1$$

$$6+1.1=7.1$$

Comparing scores

Annotation

Peter uses subtraction to solve this change unknown problem, easily applying the inverse operation to find the difference. His use of equal additions, adding 12 to both numbers, shows Peter's ability to select and apply an efficient strategy. In class, Peter demonstrates that he can use a range of strategies, appropriately choosing one for each problem.

Problem: Comparing scores

The teacher shows this problem to the student and reads it with him as required:

Two netball teams had totalled their scores for the season. Team A's total was 388. The total of Team B's scores was 652. What's the difference between their total scores?

Student response

Peter: It's 264 because it's the same as the difference between 400 and 664.

Teacher: What did you know that helped you?

Peter: I know that with some subtraction problems like this one it's easier to add the same number to both numbers and the difference stays the same. So here I added 12 to 388 to make 400, which is easy to work with. So I had to add 12 to 652.

Teacher: Tell me why you did it that way.

Peter: Because I could just see that 88 and 12 makes 100. It kind of jumped out at me. So the rest was easy.

Teacher: How would you record that?

Peter: Like this:

$$652 - 388 = \boxed{}$$

$$+12 \qquad\qquad +12$$

$$664 - 400 = 264$$

$$\text{so } 652 - 388 = 264$$

Peter: Actually I could also have done 652 – 388 like this but I reckon my first way was quicker.

$$\begin{array}{r} 652 \\ -\,388 \\ \hline \end{array}$$