Paying full price

Annotation

Rangi interprets the context of this proportional problem and recognizes that it involves multiple steps. He multiplies competently with both a decimal and fractions, accurately calculating percentages and finding a fraction of a fraction. He demonstrates a strong number sense as he responds to the numbers within the problem, keeping track of each step as he does so. He is able to explain and justify his solution.

Problem: Paying full price

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

There are 120 people at the movie theatre. 30% used a free ticket and ¾ of those who paid received a 15% discount. How many people paid full price for the movie?

Student response

Rangi:	21 people paid full price.
Teacher:	Tell me how you did that.
Rangi:	Well there's actually a few steps to this but the numbers weren't hard. First I worked that 30% of 120 is 36. Then I took 36 from 120 and that left 84 people and these were the ones who didn't get a free ticket. So to work out the three quarters of these people who paid I just looked at the number 84 and saw quickly that 4 x 21 makes 84. So 21 is ¼ of 84. The numbers were nice easy ones to work with. If ¾ of the 84 got a discount, then that leaves just ¼ which is that 21 who paid full price. You can work backwards to check by saying 21 x 4 = 84 and 84 + 36 = 120, which is what we started with.
Teacher:	What do you know that helped you?
Rangi:	Well knowing that 30% is 3/10 helps because 1/10 of 120 is 12 and 3/10 will be 36 so that bit was easy.
Working out ¼ of 84 was easy too because the numbers could be simply divided by 4. You could just see it. Oh, and you have to know that the 15% discount didn't come into the calculations. Working out exactly what to do with this problem was perhaps the hardest bit.