

Computer discount

Annotation

Max readily interprets the context of the problems and is responsive to the relationships between the numbers which he uses to good effect. He readily recognizes the efficiency of his preferred calculation method choosing it because it allows him to better manage the mental load of the calculations. He jots down some of the numbers to keep track of the calculations. He works easily with whole numbers, percentages and fractions and makes an informed estimate.

Problem: Computer discount

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

The school plans to buy 15 new computers. The local computer shop has suitable computers for \$1,050 each, and will give the school a 20% discount. How much will it cost to buy the 15 computers?

Student response

$$\begin{array}{r} 1050 \\ 840 \times 15 \\ \hline 8400 \\ 4200 \\ \hline 12600 \end{array}$$

Max: \$12,600.

Teacher: Tell me how you did that.

Well I reckoned it'd be around \$13,000 because 1000×15 is 15,000, take off $\frac{1}{5}$ of that and add a bit. I thought it was easier to work out what 20% off one computer was first and then multiply that by 15. I know 20% is $\frac{1}{5}$ and $\frac{1}{5}$ of 1000 is 200. Add to that $\frac{1}{5}$ of 50 which is 10 and that means you take 210 off the original price of a computer. So I said

Max: $1050 - 200$ is 850 and take another 10 and you get 840.

So \$840 is the price of one computer with the 20% off. Then to multiply 840 by 15 to find the total cost, I just saw that 15 is 10 and 5 and used that. 840×10 is 8,400, and half of that, 'coz you're only multiplying by 5, is 4200. Put those together and that gives you \$12,600.

Teacher: What do you know that helped you?

Well I know my percentages and fractions and that helps. Then I know to look for

Max: connections between the numbers and there were good ones to use in this problem, like the $\frac{1}{5}$ and the fact that I can divide 1050 by 5 easily.

Teacher: Tell me why you did it that way.

Max: Well I could have worked out 80% of the total for 15 computers and I'd get the same answer, but doing it this way meant the numbers were small enough to do in my head.