

# Now Much?

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## Annotation

Jack and Anne are able to solve real problems using operations involving percentages and can explain their thinking. Because the solution to the problem was not immediately obvious, Jack and Anne recognise the two-step nature of the task and can form algebraic equations for each step.

## Problem: How Much?

The teacher poses this problem:

*Todd buys a leg rope and some wax for his surfboard in a 20% off sale. He pays \$49.36 for three sticks of wax and a leg rope. If the leg rope was \$42.95 **before** the discount, what was the original price of **one** stick of wax?*

## Student Response

Jack:

$$\begin{aligned}X \times \frac{80}{100} &= 49.36 \\X &= 49.36 \times \frac{100}{80} \\&= 61.7 \\61.7 - 42.95 &= 18.75 \\ \frac{18.75}{3} &= \underline{\underline{6.25}}\end{aligned}$$

Anne:

$$\begin{aligned}42.95 - 0.2 \times 42.95 &= 34.36 \\49.36 - 34.36 &= 15 \\ \text{So the less 20\% price is } 15 \div 3 &= 5 \text{ each} \\0.8 \times \text{price} &= 5 \\ \text{price} &= 5 \div 0.8 \\&= 6.25\end{aligned}$$

Teacher: I'm interested to see, Anne and Jack, that you each went about solving this problem in a different way, yet you have both ended up with the same, the correct, answer.

Jack: Well I looked at the original price of everything and then how much of that was for the wax. I think Anne looked at how much was charged for wax and then worked out its original price.

Teacher: So should it make a difference which calculation you do first?

Jack: Not if each one is done properly.

Teacher: Anne, tell me about why you've used 0.2 in your first calculation and then you next used 0.8.

Anne: Well I was working out a 20% discount for the leg rope and to find 20% I times the number by 0.2. So I did all that working taking the 20% of the number off, but then I realised that after writing it all out, it was basically the same to have 80%. I mean the whole lot minus 0.2 of it is the same as just saying 0.8 of it.

Teacher: I was pleased to see that you calculated the original price correctly.

Jack: Yeah, it would be wrong to just add on 20% because that wasn't what happened.

Teacher: Could you give me an example?

Jack: Well after the discount, a stick of wax is \$5, so if I just add on 20% or one fifth, I get \$6. But I know that isn't the right answer to what the stick cost before cos if you take 20% off \$6 you get ...(Jack taps some numbers into his calculator)... \$4.80.

Anne: So to work out the original price, you have to kind of do algebra. If you write the price as the thing you need and go 0.8 of the price is \$5, then it's just a matter of going backwards to get the price of the wax.