

Math is hard, let's go shopp—oops

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(The title is another variation on Math is hard, let's go shopping!, which appears to be a popular catchphrase over in Michael Kaplan's neck of the woods. The history of the phrase was researched on Language Log.) Last spring, I was at a local crafts store and paid for a \$2.15 item with a \$5 bill and two dimes. The teenage salesclerk rang up the sale and began to give me \$17.90 in change. "Um, I gave you \$5.20." You'd think the salesclerk would notice something strange when the amount of change exceeded the amount of cash tendered! "Oh, right." The salesclerk had entered \$20.05 instead of \$5.20. But now came the hard part: Computing the correct amount of change. Apparently kids these days aren't taught how to make change. They just punch the number into the register and trust what comes out. "In my day," we learned to make change by rewriting the formula "change = tendered - cost" as "cost + change = tendered". In other words, you start with the cost of the item, then add money to bring the total to the amount of money you received. For example, if somebody paid for a \$3.45 item with a \$20 bill, you'd make change as follows:

You give the customer...	You say...
	three forty-five
a nickel (\$0.05)	three fifty
a quarter (\$0.25)	three seventy-five
a quarter (\$0.25)	four
a \$1 bill	five
a \$5 bill	ten
a \$10 bill	twenty

Adding up the change you created yields $\$0.05 + \$0.25 + \$0.25 + \$1 + \$5 + \$10 = \$16.55$, which is the correct amount of change for $\$20 - \3.45 . Even if kids aren't taught this technique nowadays, at least they should be able to do subtraction the traditional way. \$5.20

– \$2.15 is not a particularly difficult computation, seeing as I specifically added the extra twenty cents to avoid the borrow from the units position. But the salesclerk sat there and stared at the numbers for several seconds, unsure what to do next. I had to say, “\$5.20 minus \$2.15 is \$3.05.”

Going shopping won't let you escape math.

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