Amir: Hey Val, check out my cool new jacket!

Val: Another new jacket? Don’t you have to get a new one every year?

Amir: My jackets last about a year and a half. And each one only costs about $60. Isn’t your jacket one of those really expensive ones?

Val: It cost about $300, but I’ve had my jacket for 8 years so far. I bet you have paid more for jackets than I have.

Question: Is Val right? How do you know?

Extra: What price would Amir’s jackets have to be for him to spend the same amount as Val? What assumptions did you have to make about their jackets to solve the problem?

MATH STANDARDS ALIGNMENT

Grade 6: Ratios & Proportional Relationships
- Understand ratio concepts and use ratio reasoning to solve problems.
- Solve unit rate problems including those involving unit pricing and constant speed.

Grade 7: Ratios & Proportional Relationships
- Analyze proportional relationships and use them to solve real-world and mathematical problems.

Mathematical Practices
- 1. Make sense of problems and persevere in solving them.
- 3. Construct viable arguments and critique the reasoning of others.

Personal Finance Big Ideas:
Cost/Benefit Analysis
METHOD 1: UNIT PRICING PER YEAR
I notice after reading the problem that:

Val paid $300 for her jacket.
Val has worn her jacket for 8 years “so far.”
Amir paid $60 for his jacket.
Amir has worn his jacket for 1.5 years.

I wonder if I can compare the money they spend on jackets if I think of a “per year” expenditure. First I thought about what Val spent.

$300 divided by 8 years comes out to $37.50 per year

Next I thought about what Amir spent.

$60 divided by 1.5 years comes out to $40.00 per year

Val is right that she spends less money on jackets than Amir

METHOD 2: UNIT PRICING PER EIGHT YEARS
I notice after reading the problem that:

Val paid $300 for her jacket.
Val has worn her jacket for 8 years “so far.”
Amir paid $60 for his jacket.
Amir has worn his jacket for 1.5 years.

I wonder if I can compare the money they spend on jackets if I think of how much they each spend over an 8 year period. First I thought about what Val spends.

$300 each 8 years

Next I thought about what Amir spends.

$60 each 1.5 years
there are 5 1/3 “1.5 years” in 8 years
$60 times 5 1/3 is $319.99.... or rounding up would be $320

I wonder, though, if it really makes sense to think about Amir buying one third of a jacket.

Val is right that she spends less money on jackets than Amir.
METHOD 3: MAKE A TIMELINE

After reading the problem I know:

Val paid $300 for her jacket.
Val has worn her jacket for 8 years “so far.”
Amir paid $60 for his jacket.
Amir has worn his jacket for 1.5 years.

I made a timeline to think about this:

From my timeline I can see that Amir will have spent $300 a half year before Val needs to (possibly) spend money again on a jacket. I conclude that Val’s right but she might have to spend another $300 soon and it will be some time before Amir catches up with that amount of money spent.

Extra: Let’s assume Val’s jacket lasts only 8 years and that we want Amir and Val to have a jacket for all of the 8 years.

Looking at the timeline, we can see that in 8 years, Amir will need 5 and 1/3 jackets. But who can buy a 1/3 of a jacket? We know that in that 8 year span, Amir will have to buy 6 jackets. So for $300 Amir will need 6 jackets, $300 divided by 6 is $50 a jacket.