Math Proof

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EDU62350 - Content Knowledge And Instructional Practice I: Elementary Methods

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The Problem:

A fruit salad consists of blueberries, raspberries, grapes, and cherries. The fruit salad has a total of 280 pieces of fruit. There are twice as many raspberries as blueberries, three times as many grapes as cherries, and four times as many cherries as raspberries.

How many cherries are there in the fruit salad?

The Process:

Step	Work	Explanation
Step 1	R= Raspberries C = Cherries G = Grapes B = Blueberries R + C + G + B = 280	I set up my variables and my equation (which needs to add up to 280 fruits in the fruit salad).
Step 2	R = 2B G = 3C C = 4R ¼C + C + 3C + ⅛C = 280	I changed everything to a common variable (cherries). I know that there are twice as many blueberries as raspberries, 3 times as many cherries as grapes, and 4 times as many raspberries as cherries. Therefore I set up my equation as ¼ of cherries (to represent raspberries) + cherries (to represent cherries) + 3 times as many cherries (to represent grapes) + ⅛ of cherries (to represent blueberries) = 280 total fruit.
Step 3	4 ⅜C = 280	I added all the cherries, which equals 4 ⅜ cherries = 280.
Step 4	C = 64	I divided 280 by 4 ⅜, which equals 64 cherries. Therefore there are 64 cherries in the fruit salad.
Step 5	¼(64) + 64 + 3(64) + ⅛(64) = 280 16 + 64 + 192 + 8 = 280 R = 16 C = 64 G = 192 B = 8	Checked my work. The equation checks out with 16 raspberries, 64 cherries, 192 grapes, & 8 blueberries adding up to 280 fruits in the fruit salad.
Reflection: There are numerous ways to solve this problem. My method is probably more complicated than other methods. I think it's important for students to be able to solve it in a way that makes sense to them and to compare methods with other students so that they can see the similarities and differences so that they can eventually build towards the more efficient abstract method. Doing this math proof process forced me to slow down and think more about what I was doing in each step. It also took several attempts to fully describe each step and correct my work. This process also helped to highlight potential roadblocks that students may experience, as I also experienced problems in assigning the variables accurately. By working through the problem step by step, and using reading comprehension strategies I can better support students when/if they get stuck. Because there are so many different ways to solve this problem, it would be interesting to hear how students approach the problem and see where their thinking differs from my own!		