Task: Cost of school lunch	7th Grade

Gary and Cody's mom needs help to determine how much lunch money to send with each child in order to pay for their lunches for the remaining 26 days left in the school year. The brothers attend separate schools. Gary is in high school while Cody is in elementary school.

a.) Gary has $23.50 in his lunch account at school. His mom writes a check for $35.00 to finish out the year. Write and solve an equation to determine how much each lunch costs at the high school.

b.) Cody has $16.40 in his lunch account. A lunch at the elementary school costs $1.75. If his mom writes a check for $25.00, will he have enough money in his account to pay for lunches for the remainder of the school year? Justify your response with an equation or inequality.

c.) Identify the meaning of each number and variable in your equations or inequalities above.

Teacher Notes:

Part b. of this task intends for students to write an inequality. However, students may solve as an equation and justify their answer by explaining the logic behind it.   This becomes a valuable teaching moment during the whole group discussion to compare equations and inequalities. It will also be an important discussion that you cannot buy a portion of a day's lunch, therefore to answer part b, students round back to the whole number, and not up. Thus emphasizing the importance of recontextualizing your answer.

Common Core State Standards for Mathematical Content	Common Core State Standards for Mathematical Practice
7.EE.4a- Solve word problems leading to equations of the form px + q = r and p(x +q) = r, where p, q, and r are specific rational numbers. Solve these equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. **7.EE.4b** Solve word problems leading to inequalities of the form *px + q > r* or *px + q < r*, where *p*, *q*, and *r* are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions*.	1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others 4. Model with mathematics 5. Use appropriate tools strategically 6. Attend to precision 7. Look for and make use of structure 8. Look for and express repeated reasoning

Explore Phase	
Possible Solution Paths	**Assessing and Advancing Questions**
Part a.) $26x - 23.50 = 35$ $26x - 23.50 = 35$ $+23.50 \quad +23.50$ $\dfrac{26x}{26} \quad\quad = \dfrac{58.50}{26}$ $x \quad\quad = 2.25$ High school lunches cost \$2.25 each $26x \quad = 23.50 + 35$ $\dfrac{26x}{26} = \dfrac{53.50}{26}$ $x = 2.25$ High school lunches cost \$2.25 each	**Assessing:** What does the variable represent? Why did you add (or subtract) \$23.50 in your equation? **Advancing:** How can you explain your equation in words?

Part b.)

$$1.75x - 16.40 \leq 25.00$$

$$1.75x - 16.40 \leq 25.00$$
$$+16.40 \qquad +16.40$$

$$\frac{1.75x}{1.75} \leq \frac{41.40}{1.75}$$

$$x \leq 23.657...$$

No. Cody will not have enough money for the remainder of the year. He will only have enough money for 23 days.

$$1.75x - 16.40 = 25.00$$

$$1.75x - 16.40 = 25.00$$
$$+16.40 \qquad +16.40$$

$$\frac{1.75x}{1.75} = \frac{41.40}{1.75}$$

$$x = 23.657...$$

No. Cody will not have enough money for the remainder of the year. He will only have enough money for 23 days.

Assessing:
Can you explain why you used an inequality symbol here?
What does the variable in your equation represent?
Can you have 23.657... days for lunch? Explain.

Advancing:
Why didn't you round your answer up?
How can you explain your equation/inequality in words?
How much money should Cody's mom send if she wants to send enough for the remainder of the year?

Part c.)
 	
      Part a.)
 	
     26 = days of school
     x = cost of lunch per day
   23.50 = money already in account
   35 = money mom sent to school
 	
      Part b.)
 	
   1.75 = cost of lunch per day
    x = number of days
  16.40 = money already in account
   25 = money mom sent to school
	Assessing:
	Where did you find all of this information?
	Have you used precision in your explanation of each number and variable?
	
	Advancing:
	Can you explain the similarities and differences between parts a and b?

Possible Student Misconceptions	
Part a, students may omit or not understand what to do with $23.50 that is already in his account. Part b, students may not understand why 23.657… is not an acceptable answer for the number of days and therefore needs to be rounded to whole days.	**Assessing:** What does the $23.50 tell us in the problem? Can you have 23.657… days for lunch? Explain. **Advancing:** How much money does Gary have in his lunch account now? How much money will Gary have in his account after his mom sends a check? How can you show this in your equation? How much money would Cody need for 24 days of lunch?
Entry/Extensions	**Assessing and Advancing Questions**
If students can't get started….	**Assessing:** Can you explain the problem to me in your own words? What is the important information in the problem?

	Advancing: What is the question asking you to determine?
If students finish early….	Extension for part a. • If Gary is sick and doesn't go to school for two days? Write an equation to determine how much money his mom should get back. • What if Gary wanted his mom to send enough money for him to get an extra ice cream at lunch on Friday's? There are five Friday's and ice cream cost 95¢ each. Use all of this information to write an equation to determine how much money his mom should write a check for that includes all the lunches and the extra ice cream? Extension for part b. • How much should Cody's mom have written the check for if she wanted to pay the exact amount for the remainder of the year?

Discuss/Analyze

Whole Group Questions

- How does today's task correspond to the standards that we were addressing?
- Some people solved part b of the task using an equation, while some used an inequality. Which of these would be most precise according to the way the question is written? Why do you think so? Explain.
- How do we determine when and how we round our answer in a problem such as this? Can you provide another question or situation in which we would need to round our answer up to the next whole number?
- On parts a and b, not everyone wrote the same equation/inequality yet arrived at the same conclusion. Can you explain how the equations or inequalities relate to one another? Is one more correct than the other? Why do you think so? Explain.
- On part c, we all arrived at the same answers. Why? What is the importance of being able to explain what each number and variable represents in an equation/inequality?