Simulation of Practice: Concepts of Linear Equations and Graphs

(This simulation of practice is an adaptation of the Allen Minicase, part of the Content Knowledge for Teaching Minicases project of the Educational Testing Service.)

Suppose that you are working with your students to review for an end of year Algebra I exam. You include the following problem on a worksheet of practice problems that they completed for homework.

> While visiting New York City, John kept track of the amount of money he spent on transportation by recording the distance he traveled by taxi and the cost of the ride.
>
> | Distance, d, in miles | Cost, C, in dollars |
> |---|---|
> | 3 | 8.25 |
> | 5 | 12.75 |
> | 11 | 26.25 |
>
> Can this data be represented by the linear function $C = 2.25d + 1.5$?

Your students used different methods to solve the problem; two solutions that you would like to go over with the class are that of Jing's and Matt's. You notice that one of these solutions is correct, and the other one has a mathematical error.

Jing

$$\frac{12.75 - 8.25}{5 - 3} = \frac{4.50}{2} = 2.25$$

$$\begin{aligned} C - 26.25 &= 2.25(d - 11) \\ C - 26.25 &= 2.25d - 24.75 \\ C &= 2.25d + 1.5 \end{aligned}$$

Matt

$$\begin{aligned} 2.25(3) + 1.5 &= 8.25 \\ 2.25(5) + 1.5 &= 12.75 \\ 2.25(11) + 1.5 &= 26.25 \end{aligned}$$

You are planning what you might say to the class in response to these methods.

Record a video of yourself providing a response to students with these solution methods

1. Summarize what Jing and Matt may be thinking.
2. Say what is worthwhile about Jing's thinking and Matt's thinking.
3. Help the students complete their thinking (if there are gaps in the thinking), prompt the students to investigate an error, or help the students move forward in their thinking.
4. Give specific feedback to students that they would be able to use in their future work in mathematics.

FEEDBACK CHART

Descriptor	**Meets Expectations**	**Does Not Meet Expectations**
Is the summary of student thinking reasonable?	Summary points to reasonable explanation of student responses.	Summary does not attend to what students might have been thinking.
Is the response to student 1 reasonable?	Response to student 1 appropriately helps the student complete their thinking, prompts the student to investigate an error, or helps the student move forward in their thinking.	Response to student 1 does not accurately assess student understanding and move the student in a reasonable direction.
Is the response to student 2 reasonable?	Response to student 2 appropriately helps the student complete their thinking, prompts the student to investigate an error, or helps the student move forward in their thinking.	Response to student 2 does not accurately assess student understanding and move the student in a reasonable direction.
Is the mathematical language used appropriate?	Oral description of mathematical ideas uses accurate mathematical language.	Oral description of mathematical ideas does not use accurate mathematical language.

REFLECTION PROMPT (TO BE COMPLETED AFTER RECEIVING FEEDBACK)

1. What are some take-aways for you about using student thinking in moving toward a learning goal?
2. In light of this experience, what are the mathematical points you will make sure to highlight when you teach this in the future? What will you deemphasize? For what reasons?