

8.F Delivering the Mail, Assessment Variation

Alignments to Content Standards: 8.F.B.4

Task

Joshua's mail truck travels 14 miles every day he works, and is not used at all on days he does not work. At the end of his 100th day of work the mail truck shows a mileage of 76,762.

a. Fill in the blanks to express the mileage y as a linear function of the number of days x that Joshua has worked:

$$y = [\text{blank 1}]x + [\text{blank 2}].$$

b. What are the units of the number [the number the student typed into in blank 1] that appears in your equation?

c. What are the units of the number [the number the student typed into in blank 2] that appears in your equation?

d. Which of the following is a correct interpretation of the number [the number the student typed into in blank 1] that appears in your equation? (Select all that apply.)

- i. The mileage at the end of Joshua's first day of work.
- ii. The number of miles Joshua drives the truck each day he works.
- iii. The mileage at the beginning of Joshua's first day of work.
- iv. The number of days Joshua works for each mile he drives.
- v. The number of miles Joshua drives at work over 100 days.

e. In this context, which of the following is a correct interpretation of the number [the number the student typed into in blank 2] that appears in your equation? (Select all that apply.)

- i. The mileage at the end of Joshua's first day of work.
- ii. The number of miles Joshua drives the truck each day he works.
- iii. The mileage at the beginning of Joshua's first day of work.
- iv. The number of days Joshua works for each mile he drives.
- v. The number of miles Joshua drives at work over 100 days.

IM Commentary

This task is part of a joint project between [Student Achievement Partners](#) and Illustrative Mathematics to develop prototype machine-scorable assessment items that test a range of mathematical knowledge and skills described in the CCSSM and begin to signal the focus and coherence of the standards.

Purpose

This is one of two assessment tasks illustrating the similarities and differences between the 8th grade standards in Functions and in Statistics and Probability. The first, [8.F Mail Truck](#), involves a situation that can be modeled exactly with a linear function. The second, [8.SP US Airports](#), uses a linear function to model a relationship between two quantities that show statistical variation and do not have an exact linear relationship.

In [8.SP US Airports](#), each additional person in the state does not directly correspond to a portion of an airport, but the relationship can be modeled using a linear association, and the model can be used to make predictions about the number of airports in states with a given population. In [8.F Mail Truck](#), each additional day of driving does correspond to exactly the same increase in the number of miles put onto the truck each day.

Cognitive Complexity

Mathematical Content

This task involves constructing a linear function and interpreting its parameters in a context. Thus, this task has a medium level of complexity.

Mathematical Practice

The task asks students to reason abstractly and quantitatively (MP 2) and directly assesses component skills related to mathematical modeling (MP 4), namely, interpreting mathematical objects in contexts.

Linguistic Demand

This context in this task requires students to interpret the mathematics in this context, so has a high level of linguistic complexity.

Stimulus Material

The stimulus material is not complex.

Response Mode

The interface is not complex.

[Edit this solution](#)

Solution

a. $y = 14x + 75,362$.

b. miles/day

c. miles

d. (ii)

e. (iii)

This is a 2-point item: 1 point for parts (a)-(c) and 1 point for parts (d) and (e).



