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| **Interpreting Slope and Y-Intercept Formative Assessment 1** |
| **Link to Formative Assessment (original):** [**https://www.illustrativemathematics.org/content-standards/tasks/120**](https://www.illustrativemathematics.org/content-standards/tasks/120) |
| **Cluster & Content Standards***What content standards can be addressed by this formative assessment?***NC.8.F.4** Analyze functions that model linear relationships. • ~~Understand that a linear relationship can be generalized by y = mx + b.~~ ~~• Write an equation in slope-intercept form to model a linear relationship by determining the rate of change and the initial value, given at least two (~~*~~x~~*~~,~~ *~~y~~*~~) values or a graph.~~ ~~• Construct a graph of a linear relationship given an equation in slope-intercept form.~~ • Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of the slope and *y*-intercept of its graph or a table of values.  | **Mathematical Practice Standards***What practice standards can be addressed by this formative assessment?*3. Reason abstractly and quantitatively |
| **Learning Targets** *What learning targets will be assessed?** Interpret the rate of change and initial value of a linear function in terms of the situation it models
* Interpret the rate of change and initial value of a linear function in terms of the slope and y-intercept of its graph or table of values
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| **Timing:** During or after completing the tasks on interpreting both the slope and the y-intercept. The second part of the assessment could be used to introduce instruction about comparing linear functions. |
| **Anticipated Solutions and Possible Conceptions:**Part 1: Students are given direct instructions to interpret the meaning of the slope and y intercept in context, so answers should include:* The slope of -250 means that the car is going downhill at a rate of 250 ft per mile
* The y-intercept of 7,500 means that the car started at an elevation of 7,500ft (or that the hill is 7,500ft tall)

Part 2: The first car started at a higher elevation than the second car. The justification is open-ended and students may answer by comparing the y-intercepts (initial values), by evaluating the function at x=0 and comparing the outputs, or by comparing the starting points on the graphs.See the Illustrative Mathematics link for more possible solutions and explanations. |

**Interpreting Slope and Y-Intercept**

Formative Assessment 1

A car is traveling down a long, steep hill. The elevation, *E*, above sea level (in feet) of the car when it is *d* miles from the point the car started is given by$ E=7,500-250d$, where d can be any number from 0 to 6.

1. Find the slope and y-intercept of the graph of this function, and explain what they mean in the context of the moving car.
2. The elevation for a second car that is travelling down the same hill as the car above can be modeled by the equation $E=-250d+6,000$. What is the difference between the path taken by the two cars? Explain your answer in the context of the problem and justify it using what you have learned about linear relationships.

Adapted from: <https://www.illustrativemathematics.org/content-standards/tasks/120>

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| **Interpreting Slope and Y-Intercept Formative Assessment 2** |
| **Link to Formative Assessment (original):** <https://www.illustrativemathematics.org/content-standards/8/F/B/tasks/417> |
| **Cluster & Content Standards***What content standards can be addressed by this formative assessment?***NC.8.F.4** Analyze functions that model linear relationships. • ~~Understand that a linear relationship can be generalized by y = mx + b.~~ ~~• Write an equation in slope-intercept form to model a linear relationship by determining the rate of change and the initial value, given at least two (~~*~~x~~*~~,~~ *~~y~~*~~) values or a graph.~~ ~~• Construct a graph of a linear relationship given an equation in slope-intercept form.~~ • Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of the slope and *y*-intercept of its graph or a table of values.  | **Mathematical Practice Standards***What practice standards can be addressed by this formative assessment?*3. Reason abstractly and quantitatively |
| **Learning Targets** *What learning targets will be assessed?** Interpret the rate of change and initial value of a linear function in terms of the situation it models
* Interpret the rate of change and initial value of a linear function in terms of the slope and y-intercept of its graph or table of values
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| **Timing:** After completing the tasks on interpreting both the slope and the y-intercept.  |
| **Correct Answers** Students may have trouble differentiating the initial value and the rate of change. They may not correctly connect the slope and y-intercept of the given function to the initial value and rate of change of the scenarios.1. NO: If y is the amount of money in dollars Joaquin earns for selling x magazines, then for each magazine sold, Joaquin actually gets 2+5=7 dollars. So this situation is modeled by the function y=2x+5x=7x.
2. YES: If y is the amount of money Sandy earns for x hours of babysitting, then y=2x+5 models this situation. She earns 2 dollars per hour and the extra term of 5 represents the 5 dollar penalty Sandy charges parents for coming home late.
3. NO: If y is the amount of money in dollars John owes for renting *x* videos, then this situation is modeled by the function y=5x+2. John pays 5 dollars per video and a one time initiation fee of 2 dollars.
4. Yes: If y is the amount of money (in dollars) Andy has saved after *x* weeks then this situation is modeled by the function y=5+2x. Andy already has 5 dollars to begin with and he saves an additional 2 dollars per week.

See the original Illustrative Mathematics link for more explanations and possible solutions. |

**Interpreting Slope and Y-Intercept**

Formative Assessment 2

Which of the following could be modeled by *y = 2x + 5*? Explain why or why not for each situation.

1. Joaquin earns $2.00 for each magazine sale. Each time he sells a magazine he also gets a five-dollar tip. How much money will he earn after selling *x* magazines?

1. Sandy charges $2.00 an hour for babysitting. Parents are charged $5.00 if they arrive home later than scheduled. Assuming the parents arrived late, how much money does she earn for *x* hours?

1. Sneak Preview is a members-only video rental store. There is a $2.00 initiation fee and a $5.00 per video rental fee. How much would John owe on his first visit if he becomes a member and rents *x* videos?

1. Andy is saving money for a new CD player. He began saving with a $5.00 gift and will continue to save $2.00 each week. How much money will he have saved at the end of *x* weeks?

Adapted From: <https://www.illustrativemathematics.org/content-standards/8/F/B/tasks/417>