Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**CFS for top quality work**

* Problem is annotated for meaning (**operations and signs of numbers)**
* Model is drawn representing the situation
* **Expression is written** from the model
* Expression is evaluated and solution is represented in the **context of the problem**

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

UNIT 2 LESSON 4

**AIM**: SWBAT model and solve multi-step real-world multiplication problems using expressions

**THINK ABOUT IT!**

Marcus is downloading albums in iTunes to update his playlists which is sorely needed. He buys 8 albums at $9 apiece. How much money is in his bank account if he started the day with $71 in his account? Draw a model and write an expression before solving.

Key Point

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| Mathematicians use \_\_\_\_\_\_\_\_\_\_\_\_ to make sense of and solve complex problems |

**Interaction with New Material**: Lo went cliff diving in Belize over the summer. During one of her jumps, she descended 15 feet per second for 7 seconds and then came up for air. If she was at a depth of 12 feet underwater after the 7 seven seconds, how high was the cliff she dove from?

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**PARTNER PRACTICE**

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| *Bachelor Level* |

1. Kiev in the Ukraine is experiencing a dramatic temperature change, with temperatures dropping at a rate of 5 degrees per hour for the last 8 hours. Model each problem using a number line
	1. What rational number represents the change in temperature over the 8 hour period described?
	2. If the temperature was -3 degrees Celsius when the 8 hour time period began, what is the temperature now?
	3. If the temperature drops twice as quickly for the next 6 hours as it did for the last 8 hours, what will the temperature be 6 hours from now?

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| *Master Level* |

1. An airplane from Johannesburg, South Africa is starting its decent to JFK Airport. If the plane descends towards the ground at an average rate of 1,200 feet per minute, what rational number represents its change in altitude after 17 minutes of descending?
2. Mr. Friedline decided to buy a slice of pizza for all of his scholars in his small group with him. He called the local pizza spot and determined that one slice of pizza would cost him $2. Mr. Friedline usually has 26 scholars in his SGI groups throughout the day, but today, three are sick. What rational number will represent the change to Mr. Friedline’s account if he buys a slice for all the SGI scholars at school today including one piece for him? Model the problem using a number line and write an expression.

**INDEPENDENT PRACTICE**

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| *Bachelor Level* |

1. Alphonso is playing trivia with his brother. Every time he gets a question correct, he is awarded 10 points and every time he gets a question incorrect, he loses 15 points.

Part A: Aphonso got the first 6 questions incorrect. Draw a model using a number line and determine his score after the first six questions.

Part B: The next set of five questions, Alphonso got correct. Draw a model using a number line to determine his score for this set of questions.

Part C: What was Alphonso’s score after the first 11 questions?

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| *Master Level* |

1. Luz and Mario are playing a trivia game. For every correct answer, you earn 12 points. For every incorrect answer, you lose 9 points. For every question not answered, you lose 5 points. The summary of Luz and Mario’s game is shown below.

|  |  |  |
| --- | --- | --- |
| Score Category | Luz | Mario |
| Correct answers | 9 | 7 |
| Incorrect answers | 7 | 5 |
| Unanswered | 6 | 10 |
| Totals: |  |  |

Complete the chart above to determine who won the trivia game. Show your thought process and your work below with a number line.

1. Paolo is competing in a mountain biking race, and he has to ride his bike down one of the steepest trails ever covered by a human being. To win, he needs to descend the course at a speed of 180 meters per minute. If the course takes 9 minutes, what was Paolo overall change in altitude? Model the problem using a number line and an expression
2. In order for Substance X to freeze, its temperature must be below -13 degrees Celsius. At the moment, the Substance’s temperature measures 32 degrees Celsius. Dr. Albert calculated that in the freezer, the temperature can decrease at a rate of 2 degrees per minute. Model the problem using a number line and an expression
	1. If Dr. Albert leaves Substance X in the freezer for 20 minutes, what will be its net change in temperature?
	2. Will Sustance X be frozen enough after this amount of time? If yes, prove it. If not, determine how long Substance X needs to stay in the freezer in order for it to become cold enough to freeze?

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| *PhD Level* |

1. Esmeralda has decided that every month, for as long as she can afford it, she’s going to donate $250 to a charity that helps fund research on treatments for cancer. Esmeralda sticks to her word and continues donating for 2 years. Determine how many more months she can afford to donate if the starting balance of the account is $8,000.

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**EXIT TICKET**

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| --- | --- | --- | --- |
| Self-assessment | I mastered the learning objective today. | I am almost there.  | Need more practice and feedback. |
| Teacher feedback | You mastered the learning objective today. | You are almost there.  | You need more practice and feedback. |

1. Two climbers are at the top of Mount Everest, the highest peak in the world. They begin their descent and climb at an average rate of 250 feet per hour, heading down to the base. After two days, they’ve completed 7 hours of climbing. What rational number represents the change in their altitude?
	1. Write an expression to represent this situation.
	2. Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. On the lines below, explain how you know your answer is reasonable.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. From midnight to 6:00am on a winter night, the temperature in Fergus Falls, Minnesota steadily decreased, dropping 3 degrees each hour. If the temperature was 13 degrees midnight, what was the temperature at 6:00am? Draw a model and write an expression to show your work and represent the solution to this problem.