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

UNIT 3 LESSON 2

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| AIM: | SWBAT represent real world contexts |

**THINK ABOUT IT!**

For Tim’s 13th birthday, his dad took him to the bank to open a savings account. Later that day, he received $50 in cash from his mom, so Tim went back to the bank and gave the cash to the banker to deposit into the account. One week later, Tim deposited another $25 that he had earned as allowance. The next month, Tim asked his dad for permission to withdraw $35 to buy a new video game. Tim’s dad explained that the bank would charge $5 for each withdrawal from the savings account and that each withdrawal and charge results in a debit to the account.

1. Draw a number line and represent each transaction described above on the same number line.
2. Place a point that represents the amount of money in Tim’s account when he first opened it.

Key Point

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| Mathematicians use integers and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to represent real world \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |

**Interaction with New Material**

Ex. 1) Alonso loves to jump off of cliffs into the ocean. He is standing 15 feet above sea level and 20 feet above the ocean floor. Sea level represents an elevation of 0 feet. What are two ways to describe the elevation of the ocean floor?

**PARTNER PRACTICE**

* CFS for top quality work
	+ Problem is annotated with margin notes to provide additional meaning
	+ Number line is drawn to represent information
	+ Answer statement is written
	+ Work is organized and neat

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| *Bachelor Level* |

1. Michael and Shaila went to a cliff to jump off of into the ocean. Shaila jumped first and dove to a depth of 6 feet below sea level. Michael got scared and stayed at the top of the cliff at 9 feet above sea level. Represent each height as an integer, and plot them on a number line.

What type of number line did you use for problem 1? Why did you choose to use that type of number line?

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After her dive, Shaila swam back to sea level. What integer would you use to describe her height when she is at sea level? Explain.

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1. Zoe, Daquan and Leslie played Sorry. Over three turns, Zoe advanced 4 spaces, Daquan went back 3 spaces and Leslie didn’t move. Use a numberline to help you determine which of the following statements are true. Select all that apply.

A) Zoe’s position on the board can be represented by 4

B) Leslie’s position on the board can be represented by 0

C) 0 represents the starting point

D) Daquan’s position can be represented by -3

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| *Master Level* |

1. In the table below, the coach of the New England Patriots recorded the number of yards his football players gained or lost on each play. Complete the table by writing an integer that represents the amount of yards gained or lost for each play or by writing a statement to describe the given integer.

|  |  |  |
| --- | --- | --- |
| **Play** | **Yards gained/lost** | **Integer** |
| **1** | 5 yd gained |  |
| **2** | 15 yd lost |  |
| **3** | 0 yd |  |
| **4** | 4 yd lost |  |
| **5** |  | **-3** |
| **6** |  | **12** |

For the third play, how would you describe the number of yards gained or lost on play 3?

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1. For two straight months, Myasia measured her dog’s weight. During the first month, she found that her dog’s weight increased by 9 pounds from the dog’s starting weight. During the second month, she found that her dog’s weight decreased by 12 pounds. Represent the dog’s weight relative to its starting weight after two months on a number line and as an integer.

**INDEPENDENT PRACTICE**

* CFS for top quality work
	+ Problem is annotated with margin notes to provide additional meaning
	+ Number line is drawn to represent information
	+ Answer statement is written
	+ Work is organized and neat

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| *Bachelor Level* |

1. Mr. Vasquez went to a restaurant with his family last weekend. He used his bank card and his bank account was debited $45. Represent this amount using an integer and explain why you chose that integer.

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Which context could be represented by the integer: 4
2. 4 degrees below 0
3. 4 feet above sea level
4. Withdraw $4 from a bank account
5. Debit $4 from an account

Explain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Which context could be represented by the number: 0? Select all that apply.
	1. Ascend twelve feet
	2. Remain on the same level
	3. Be penalized 1 point
	4. Profit of $1
	5. Sea level
	6. Ocean floor
2. Dan owns a business that sells horse saddles. In March, he made a profit of $8. In April, he lost $5 and in May, he didn’t earn or lose any money. Write an integer to represent the amount of money earned or lost for each month. Plot each month on a number line.

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| *Master Level* |

1. Four friends traveled to Capri, Italy and went to the ocean to go swimming. The elevations of each friend relative to sea level are listed in the table below.

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| **Friend** | **Elevation** |
| Joe | -12 ft. |
| Arda | 3 ft. above sea level |
| Kumsal | 0 ft. |
| Ken | 2ft. below sea level |

* + 1. Represent each of the friends elevations on a number line
		2. What does 0 ft. represent in this situation?
		3. Arda jumped into the ocean from where is was standing and traveled 7 feet down. What was his elevation when he stopped traveling down?
1. Giovanni opened a bank account. On the same day, he deposited $15 into the account. The next day, he took out $20. Represent his account balance after he took out $20 on a number line and as an integer.
2. For each letter below:

1) Read the statement

2) Circle which statement(s) below it is true

3) Correct whichever statement is false

The first one has been done for you

* 1. A submarine is submerged 800 feet below sea level.
		1. The depth of the submarine is -800 feet below sea level.

*Change: The depth of the submarine is 800 feet below sea level.*

* + 1. 800 feet below sea level can be represented by the integer -800
	1. The elevation of a coral reef with respect to sea level is given as -250 feet.
		1. The coral reef is 250 feet below sea level
		2. The depth of the coral reef is -250 feet below sea level
	2. Alex’s body temperature decreased 2 degrees Fahrenheit.
		1. Alex’s body temperature dropped 2 degrees Fahrenheit
		2. The integer -2 represents the change in Alex’s body temperature in degrees Fahrenheit
	3. Ali’s account balance reads -$14
		1. Ali has a debt of -$14
		2. Ali owes the bank -$14
1. Jose was presented with the following problem:

*Jessica swam 4 feet below the surface of the water in a pool. Represent the depth at which she swam using an integer.*

For his answer, Jose wrote: You can represent the depth at which she swam using the integer 4 because she is four feet from the surface of the water.

Do you agree with his response? Explain why or why not.

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1. Mr. Truong went to the bank and withdrew $200 from his bank account and put it in his wallet.

Part A: What integer represents the change in the amount of money in his bank account?

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Part B: What integer represents the change in the amount of money in his wallet?

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Part C: Are the two integers from Parts A and B the same or different? Explain.

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| *PhD Level* |

1. Write a real world problem using sea level that includes both integers -110 and 120.

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 What does zero represent in your problem?

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Choose an appropriate scale and graph the integers in your problem on a number line.

What is the distance between the two integers?

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 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. Sharifa opened a bank account that initially had $0 in it. She then deposited $150. Later that week, she withdrew $35. Write each value as an integer and model the integer on a number line.
2. On the first play of a football game, the Baltimore Ravens moved the football -15 yards. Select all statements that are true about this situation.
	* 1. 0 represents the place where the Ravens were at the start of the play
		2. 0 represents the place where the Ravens were at the end of the pla
		3. The Ravens lost -15 yards on the play
		4. The Ravens gained 15 yards on the play
		5. The Ravens lost 15 yards on the play
3. Tiago overdrew his bank account and now has an account balance of -65 dollars.
	1. Draw a number line and plot a point to represent Tiago’s account balance.
	2. What does -$65 mean in this context?
	3. What does $0 represent in this context?