Lesson 2: Real-World Positive and Negative Numbers and Zero

Classwork

Example 1: Take it to the Bank

Read Example 1 silently. In the first column, write down any words and definitions you know. In the second column, write down any words you do not know.

For Tim's 13th birthday, he received $150 in cash from his mom. His dad took him to the bank to open a savings account. Tim gave the cash to the banker to deposit into the account. The banker credited Tim's new account $150 and gave Tim a receipt. 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.

Words I Already Know:	Words I Want to Know:	Words I Learned:

In the third column, write down any new words and definitions that you learn during the discussion.

Exercises 1–2

1.   Read Example 1 again. With your partner, number the events in the story problem. Write the number above each sentence to show the order of the events.

For Tim's 13th birthday, he received $150 in cash from his mom. His dad took him to the bank to open a savings account.

Tim gave the cash to the banker to deposit into the account. The banker credited Tim's new account $150 and gave Tim

a receipt. 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.

2.   Write each individual description below as an integer. Model the integer on the number line using an appropriate scale.

EVENT	INTEGER	NUMBER LINE MODEL
Open a bank account with $0.		
Make a $150 deposit.		
Credit an account for $150.		
Make a deposit of $25.		
A bank makes a charge of $5.		
Tim withdraws $35.		

Example 2: How Hot, How Cold?

Temperature is commonly measured using one of two scales, Celsius or Fahrenheit. In the United States the Fahrenheit system continues to be the accepted standard for non-scientific use. All other countries have adopted Celsius as the primary scale in use. The thermometer shows how both scales are related.

   a.   The boiling point of water is 100℃. Where is 100 degrees Celsius located on the thermometer to the right?

   b.   On a vertical number line, describe the position of the integer that represents 100℃.

   c.   Write each temperature as an integer.

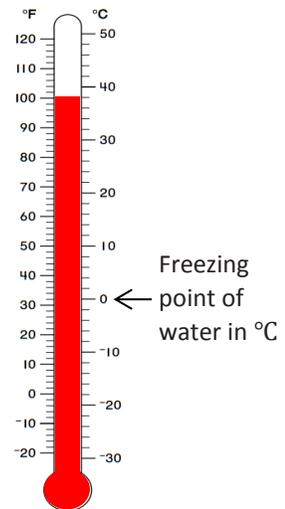   i.   The temperature shown on the thermometer in ℉:

       ii.   The temperature shown on the thermometer in ℃:

       iii. Freezing point of water in Celsius:

   d.   If someone tells you your body temperature is 98.6°, what scale are they using? How do you know?

   e.   Does the temperature 0 degrees mean the same thing on both scales?

Exercises 3–5

3. Write each word under the appropriate column, "Positive Number" or "Negative Number."

    Gain   Loss   Deposit   Credit   Debit   Charge   Below Zero   Withdraw   Owe   Receive

Positive Number	Negative Number

4. Write an integer to represent each of the following situations:

    a.   A company loses $345,000 in 2011.   _____

    b.   You earned $25 for dog sitting.   _____

    c.   Jacob owes his dad $5.   _____

    d.   The temperature at the sun's surface is about 5,600℃.   _____

    e.   The temperature outside is 4 degrees below zero.   _____

    f.   A football player lost 10 yards when he was tackled.   _____

5. Describe a situation that can be modeled by the integer -15. Explain what zero represents in the situation.

Problem Set

1. Express each situation as an integer in the space provided.

   a. A gain of 56 points in a game _____

   b. A fee charged of $2 _____

   c. A temperature of 32 degrees below zero _____

   d. A 56 yard loss in a football game _____

   e. The freezing point of water in Celsius _____

   f. A $12,500 deposit _____

For Questions 2–5, use the thermometer to the right.

2. Each sentence is stated *incorrectly*. Rewrite the sentence to correctly describe each situation.

   a. The temperature is −10 degrees Fahrenheit below zero.

   b. The temperature is −22 degrees Celsius below zero.

3. Mark the integer on the thermometer that corresponds to the temperature given.

   a. 70°F

   b. 12°C

   c. 110°F

   d. −4°C

4. The boiling point of water is 212°F. Can this thermometer be used to record the temperature of a boiling pot of water? Explain.

5. Kaylon shaded the thermometer to represent a temperature of 20 degrees below zero Celsius as shown in the diagram. Is she correct? Why or why not? If necessary, describe how you would fix Kaylon's shading.