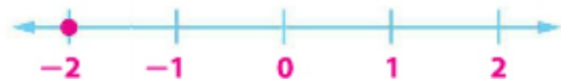## Guided Practice

Write an integer for each situation. Explain the meaning of zero in each situation. (Examples 1–3)
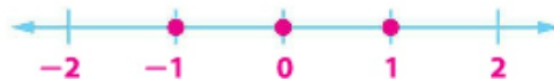
1. 15-yard gain   _15; The integer 0 represents neither a gain nor a loss._

2. loss of 2 hours   _−2; The integer 0 represents neither a gain nor a loss._

Graph each integer or set of integers on a number line. (Examples 4–6)

3. −2

4. {−1, 1, 0}

5. The data set {+5, 0, −15, +20} shows the number of points Delaney scored on each hand of a card game. Graph the scores. Explain the meaning of zero in this situation. (Example 7)
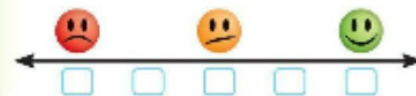
The integer 0 represents a score of 0.

6. ⓔ **Building on the Essential Question** How can you use integers to represent data?

Sample answer: Integers can be used to represent a gain or loss, temperatures above or below 0°, or elevations above and below sea level.

Write an integer for each situation. Explain the meaning of zero in each situation. (Examples 1–3)

1. 3 miles below sea level   **−3; The integer 0 represents at sea level.**

2. earning $45   **45; The integer 0 represents neither earning nor spending.**

3. moving back 5 spaces on a game board   **−5; The integer 0 represents**

   neither moving backward nor moving forward.

Graph each integer or set of integers on a number line. (Examples 4–6)

4. −5

−5 −4 −3 −2 −1   0   1

5. {2, −3, 0, 1}

−4 −3 −2 −1   0   1   2

6. The data set {+4, −1, −2, 0} shows a change in number of state representatives for four states after the last census. Graph the change in number of representatives. Explain the meaning of zero in this situation. (Example 7)

   The integer 0 represents neither a gain nor loss in number of representatives.

−2 −1   0   1   2   3   4

6. The data set {+4, −1, −2, 0} shows a change in number of state representatives for four states after the last census. Graph the change in number of representatives. Explain the meaning of zero in this situation. (Example 7)

**The integer 0 represents neither a gain nor loss in number of representatives.**

$$-2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4$$

7. **CCSS** **Use Math Tools** The table shows the record low temperatures for several states. Graph the temperatures on a number line.

$$-34 \quad -33 \quad -32 \quad -31 \quad -30 \quad -29 \quad -28 \quad -27 \quad -26$$

Record Low Temperature by State (°F)				
AL	AK	CT	NJ	VA
−27	−29	−32	−34	−30

8. **CCSS** **Use Math Tools** The table shows the number of points earned for each action in a video game. While playing the video game, Kevin fell in water, jumped over a rock, touched a cactus and climbed a mountain. Graph the number of points he earned for each action on the number line.

$$-15 \quad -10 \quad -5 \quad 0 \quad 5 \quad 10 \quad 15$$
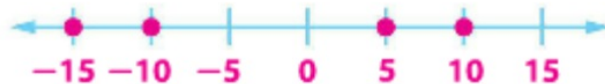
Action	Points
fall in water	−10
walk over a bridge	+5
climb mountain	+10
jump over rock	+5
walk through quicksand	−15
touch cactus	−15

9. **CCSS** **Model with Mathematics** Complete the graphic organizer by writing words or symbols used to represent positive and negative integers. **Sample answers are given.**

Positive Integer	Negative Integer
• gain	• lose
• above	• below
• earn	• spend
• +	• −

H.O.T. Problems Higher Order Thinking

10. **CCSS** **Persevere with Problems** A football team receives the ball on their own 10 yard line.

a. They make a gain of 15 yards in the first play. What yard line is the ball on?

the 25 yard line

b. What represents zero in this situation? Explain.

The 10 yard line represents neither a gain nor loss in yards.

11. **CCSS** **Justify Conclusions** The temperature outside is 15°F. If the temperature drops 20°, will the outside temperature be represented by a positive or negative integer? Explain your reasoning.

Negative; Sample answer: A drop of 15° would result in a temperature of 0°F. Since the drop of 20° is greater than 15°, the temperature is below zero and will be represented by a negative integer.

11. CCSS **Justify Conclusions** The temperature outside is 15°F. If the temperature drops 20°, will the outside temperature be represented by a positive or negative integer? Explain your reasoning.

Negative; Sample answer: A drop of 15° would result in a temperature of

0°F. Since the drop of 20° is greater than 15°, the temperature is below

zero and will be represented by a negative integer.

12. CCSS **Identify Structure** Describe the characteristics of each set of numbers that make up the set of integers.

Sample answer: Negative integers are to the left of zero on the number

line, positive integers are to the right of zero on the number line, and

zero is neither positive nor negative.

13. CCSS **Reason Inductively** Explain how to find the distance between −2 and 3 on a number line.

Sample answer: Locate −2 and 3 on a number line. Count the number of

units between each integer and 0. −2 is 2 units to the left of zero and 3 is

3 units to the right. So, the number of units between −2 and 3 is 2 + 3 or

5 units.