

## Lesson 4: The Opposite of a Number

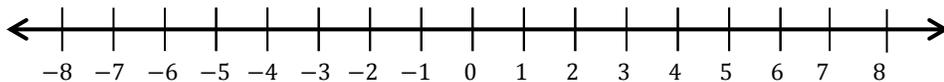
### Classwork

#### Exercise 1: Walk the Number Line

- Each integer has an opposite, denoted  $-a$ ;  $-a$  and  $a$  are opposites if they are on opposite sides of zero and the same distance from zero on the number line.

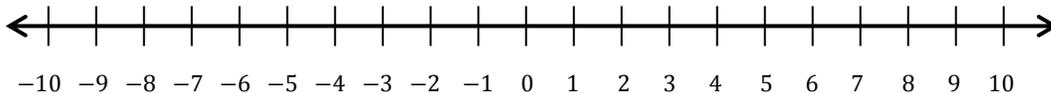
#### Example 1: Every Number has an Opposite

Locate the number 8 and its opposite on the number line. Explain how they are related to zero.



#### Exercises 2–3

- Locate and label the opposites of the numbers on the number line.
  - 9
  - 2
  - 4
  - 7

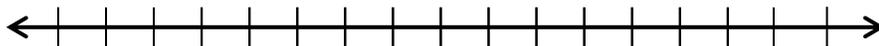


3. Write the integer that represents the opposite of each situation. Explain what zero means in each situation.
- 100 feet above sea level.
  - 32 degrees below zero.
  - A withdrawal of \$25.

**Example 2: A Real-World Example**

Maria decides to take a walk along Central Avenue to purchase a book at the bookstore. On her way, she passes the Furry Friends Pet Shop and goes in to look for a new leash for her dog. Furry Friends Pet Shop is seven blocks west of the bookstore. She leaves Furry Friends Pet Shop and walks toward the bookstore to look at some books. After she leaves the bookstore, she heads east for seven blocks and stops at Ray's Pet Shop to see if she can find a new leash at a better price. Which location, if any, is the furthest from Maria while she is at the bookstore?

Determine an appropriate scale and model the situation on the number line below.



Explain your answer. What does zero represent in the situation?

**Exercises 4–6**

Read each situation carefully and answer the questions.

4. On a number line, locate and label a credit of \$15 and a debit for the same amount from a bank account. What does zero represent in this situation?



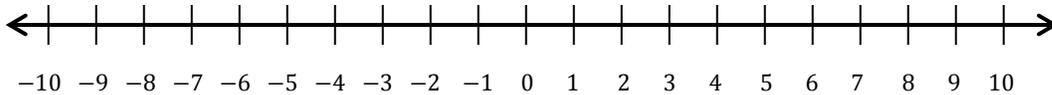
5. On a number line, locate and label  $20^{\circ}\text{C}$  below zero and  $20^{\circ}\text{C}$  above zero. What does zero represent in this situation?



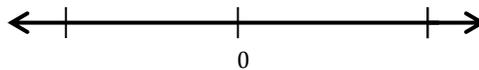
6. A proton represents a positive charge. Write an integer to represent 5 protons. An electron represents a negative charge. Write an integer to represent 3 electrons.

**Problem Set**

1. Find the opposite of each number and describe its location on the number line.
  - a.  $-5$
  - b.  $10$
  - c.  $-3$
  - d.  $15$
  
2. Write the opposite of each number and label the points on the number line.
  - a. Point A: The opposite of 9.
  - b. Point B: The opposite of  $-4$ .
  - c. Point C: The opposite of  $-7$ .
  - d. Point D: The opposite of 0.
  - e. Point E: The opposite of 2.



3. Study the first example. Write the integer that represents the opposite of each real-world situation. In words, write the meaning of the opposite.
  - a. An atom's positive charge of 7
  - b. A deposit of \$25
  - c. 3,500 feet below sea level
  - d. A rise of  $45^{\circ}\text{C}$
  - e. A loss of 13 pounds
  
4. On a number line, locate and label a credit of \$38 and a debit for the same amount from a bank account. What does zero represent in this situation?



5. On a number line, locate and label  $40^{\circ}\text{C}$  below zero and  $40^{\circ}\text{C}$  above zero. What does zero represent in this situation?

