Integers

? **ESSENTIAL QUESTION**

How can you use integers to solve real-world problems?

Real-World Video

Integers can be used to describe the value of many things in the real world. The height of a mountain in feet may be a very great integer while the temperature in degrees Celsius at the top of that mountain may be a negative integer.

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Are YOU Ready?

Complete these exercises to review skills you will need for this module.

Compare Whole Numbers

EXAMPLE

3,564 ⬤ 3,528	Compare digits in the thousands place: $3 = 3$
3,564 ⬤ 3,528	Compare digits in the hundreds place: $5 = 5$
3,564 ◯ 3,528	Compare digits in the tens place: $6 > 2$

Compare. Write $<$, $>$, or $=$.

1. 471 ◯ 468   **2.** 5,005 ◯ 5,050   **3.** 398 ◯ 389

4. 10,973 ◯ 10,999   **5.** 8,471 ◯ 9,001   **6.** 108 ◯ 95

Order Whole Numbers

EXAMPLE

356, 348, 59, 416	Compare digits. Find the greatest number.
356, 348, 59, 416	Find the next greatest number.
356, 348, 59, 416	Find the next greatest number.
356, 348, 59, 416	Find the least number.
$416 > 356 > 348 > 59$	Order the numbers.

Order the numbers from greatest to least.
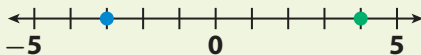
7. 156; 87; 177; 99

8. 591; 589; 603; 600

9. 2,650; 2,605; 3,056; 2,088

10. 1,037; 995; 10,415; 1,029
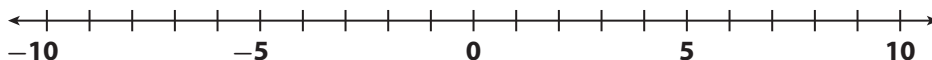
Locate Numbers on a Number Line

EXAMPLE

Graph $+4$ by starting at 0 and counting 4 units to the right.
Graph -3 by starting at 0 and counting 3 units to the left.

Graph each number on the number line.

11. -1 **12.** $+10$ **13.** 2   **14.** -8

Reading Start-Up

Visualize Vocabulary

Use the ✔ words to complete the chart. Write the correct vocabulary word next to the symbol.

Symbol

- < →
- > →
- = →
- + →
- − →

Understand Vocabulary

Complete the sentences using the preview words.

1. An _____ is a statement that two quantities are not equal.

2. The set of all whole numbers and their opposites are _____.

3. Numbers greater than 0 are _____. Numbers less than 0 are _____.

Active Reading

Key-Term Fold Before beginning the module, create a key-term fold to help you learn the vocabulary in this module. Write the highlighted vocabulary words on one side of the flap. Write the definition for each word on the other side of the flap. Use the key-term fold to quiz yourself on the definitions in this module.

COMMON CORE

Unpacking the Standards

Understanding the standards and the vocabulary terms in the standards will help you know exactly what you are expected to learn in this module.

COMMON CORE 6.NS.6a

Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.

Key Vocabulary

Integers *(entero)*
The set of all whole numbers and their opposites.

opposites *(opuestos)*
Two numbers that are equal distance from zero on a number line.

What It Means to You

You will learn that opposites are the same distance from 0 on a number line but in different directions.

UNPACKING EXAMPLE 6.NS.6A

Use the number line to determine the opposites.

$-(5) = -5$ The opposite of 5 is -5.

$-(-5) = 5$ The opposite of -5 is 5.

$-(0) = 0$ The opposite of 0 is 0.

COMMON CORE 6.NS.7

Understand ordering and absolute value of rational numbers.

Key Vocabulary

absolute value *(valor absoluto)*
A number's distance from 0 on the number line.

rational number
(número racional)
Any number that can be expressed as a ratio of two integers.
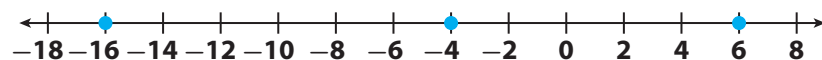
What It Means to You

You can use a number line to order rational numbers.

UNPACKING EXAMPLE 6.NS.7

At a golf tournament, David scored $+6$, Celia scored -16, and Xavier scored -4. One of these three players was the winner of the tournament. Who won the tournament?

The winner will be the player with the lowest score. Draw a number line and graph each player's score.

Celia's score, -16, is the farthest to the left, so it is the lowest score. Celia won the tournament.

Visit **my.hrw.com** to see all the **Common Core Standards** unpacked.

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Identifying Integers and Their Opposites

? **ESSENTIAL QUESTION**

How do you identify an integer and its opposite?

EXPLORE ACTIVITY 1 Real World

COMMON CORE **6.NS.5, 6.NS.6**

Positive and Negative Numbers

Positive numbers are numbers greater than 0. Positive numbers can be written with or without a plus sign; for example, 3 is the same as $+3$. **Negative numbers** are numbers less than 0. Negative numbers must always be written with a negative sign.

The number 0 is neither positive nor negative.

$$-5 \ -4 \ -3 \ -2 \ -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5$$

Negative integers   Positive integers
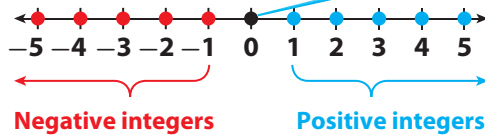
The elevation of a location describes its height above or below sea level, which has elevation 0. Elevations below sea level are represented by negative numbers, and elevations above sea level are represented by positive numbers.

A The table shows the elevations of several locations in a state park. Graph the locations on the number line according to their elevations.

Location	Little Butte *A*	Cradle Creek *B*	Dinosaur Valley *C*	Mesa Ridge *D*	Juniper Trail *E*
Elevation (ft)	5	-5	-9	8	-3

$$-10 \ -9 \ -8 \ -7 \ -6 \ -5 \ -4 \ -3 \ -2 \ -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9 \quad 10$$
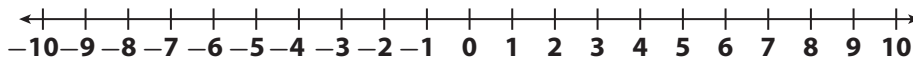
B What point on the number line represents sea level? _____

C Which location is closest to sea level? How do you know?

_____

D Which two locations are the same distance from sea level? Are these locations above or below sea level?

_____

E Which location has the least elevation? How do you know?

_____

Reflect

1. **Analyze Relationships** Morning Glory Stream is 7 feet below sea level. What number represents the elevation of Morning Glory Stream?
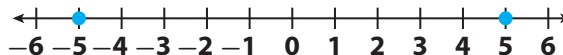
_____

2. **Multiple Representations** Explain how to graph the elevation of Morning Glory Stream on a number line.

_____

EXPLORE ACTIVITY 2   COMMON CORE 6.NS.6a

Opposites

Two numbers are **opposites** if, on a number line, they are the same distance from 0 but on different sides of 0. For example, 5 and -5 are opposites. 0 is its own opposite.

Integers are the set of all whole numbers and their opposites.

> Remember, the set of whole numbers is 0, 1, 2, 3, 4, 5, 6, …

On graph paper, use a ruler or straightedge to draw a number line. Label the number line with each integer from -10 to 10. Fold your number line in half so that the crease goes through 0. Numbers that line up after folding the number line are opposites.

A Use your number line to find the opposites of 7, -6, 1, and 9. _____

B How does your number line show that 0 is its own opposite?

_____

C What is the opposite of the opposite of 3? _____

Reflect

3. **Justify Reasoning** Explain how your number line shows that 8 and -8 are opposites.

_____

4. **Multiple Representations** Explain how to use your number line to find the opposite of the opposite of -6.

_____

_____

_____

Integers and Opposites on a Number Line

Positive and negative numbers can be used to represent real-world quantities. For example, 3 can represent a temperature that is 3 °F above 0. −3 can represent a temperature that is 3 °F below 0. Both 3 and −3 are 3 units from 0.

EXAMPLE 1 — Real World
COMMON CORE 6.NS.6a, 6.NS.6c

Sandy kept track of the weekly low temperature in her town for several weeks. The table shows the low temperature in °F for each week.

Week	Week 1	Week 2	Week 3	Week 4
Temperature (°F)	−1	3	−4	2

A Graph the temperature from Week 3 and its opposite on a number line. What do the numbers represent?
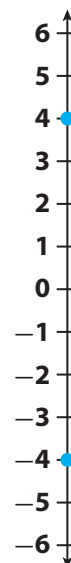
STEP 1 Graph the value from Week 3 on the number line.
The value from Week 3 is −4.
Graph a point 4 units below 0.

STEP 2 Graph the opposite of −4.
Graph a point 4 units above 0.

The opposite of −4 is 4.

−4 represents a temperature that is 4 °F below 0 and 4 represents a temperature that is 4 °F above 0.

B The value for Week 5 is the opposite of the opposite of the value from Week 1. What was the low temperature in Week 5?

STEP 1 Graph the value from Week 1 on the number line.
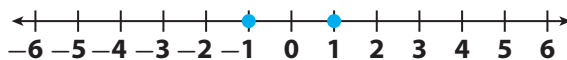*The value from Week 1 is −1.*

STEP 2 Graph the opposite of −1.
The opposite of −1 is 1.

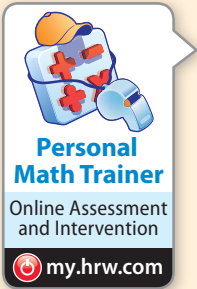**STEP 3** Graph the opposite of 1.
The opposite of 1 is −1.

The opposite of the opposite of −1 is −1.
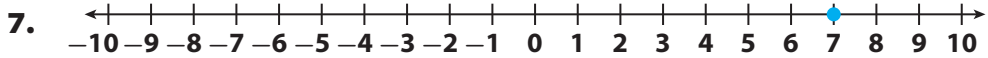The low temperature in Week 5 was −1 °F.

Reflect

5. **Analyze Relationships** Explain how you can find the opposite of the opposite of any number without using a number line.

YOUR TURN

Graph the opposite of the number shown on each number line.

6.

$$\overset{\longleftarrow}{\underset{-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\quad 0\quad 1\quad 2\quad 3\quad 4\quad 5\quad 6\quad 7\quad 8\quad 9\ 10}{\bullet}}$$

7.

$$\overset{\longleftarrow}{\underset{-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\quad 0\quad 1\quad 2\quad 3\quad 4\quad 5\quad 6\quad 7\quad 8\quad 9\ 10}{\bullet}}$$

Write the opposite of each number.

8. 10 _____

9. −5 _____

10. 0 _____

11. What is the opposite of the opposite of 6? _____

Math Talk
Mathematical Practices

Explain how you could use a number line to find the opposite of 8.

Guided Practice

1. Graph and label the following points on the number line.
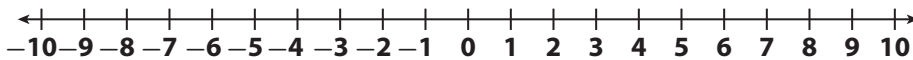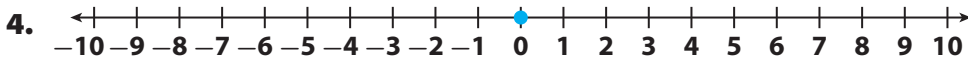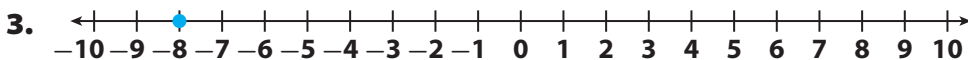(Explore Activity 1)

    a. −2   **b.** 9   **c.** −8   **d.** −9   **e.** 5   **f.** 8

$$\overset{\longleftarrow}{\underset{-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\quad 0\quad 1\quad 2\quad 3\quad 4\quad 5\quad 6\quad 7\quad 8\quad 9\ 10}{}}$$

Graph the opposite of the number shown on each number line.
(Explore Activity 2 and Example 1)

2.

$$\overset{\longleftarrow}{\underset{-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\quad 0\quad 1\quad 2\quad 3\quad 4\quad 5\quad 6\quad 7\quad 8\quad 9\ 10}{\bullet}}$$

3.

$$\overset{\longleftarrow}{\underset{-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\quad 0\quad 1\quad 2\quad 3\quad 4\quad 5\quad 6\quad 7\quad 8\quad 9\ 10}{\bullet}}$$

4.

$$\overset{\longleftarrow}{\underset{-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\quad 0\quad 1\quad 2\quad 3\quad 4\quad 5\quad 6\quad 7\quad 8\quad 9\ 10}{\bullet}}$$
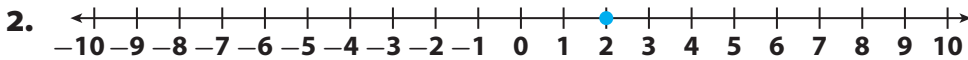
Write the opposite of each number. (Explore Activity 2 and Example 1)

5. 4 _____   **6.** −11 _____   **7.** 3 _____

8. −3 _____   **9.** 0 _____   **10.** 22 _____

? ESSENTIAL QUESTION CHECK-IN

11. Given an integer, how do you find its opposite?

_____

_____

1.1 Independent Practice

COMMON CORE 6.NS.5, 6.NS.6, 6.NS.6a, 6.NS.6c

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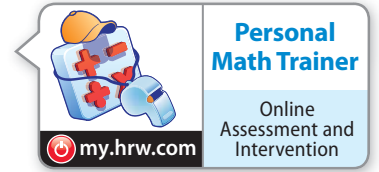
12. Chemistry Atoms normally have an electric charge of 0. Certain conditions, such as static, can cause atoms to have a positive or a negative charge. Atoms with a positive or negative charge are called *ions*.

Ion	A	B	C	D	E
Charge	−3	+1	−2	+3	−1

a. Which ions have a negative charge?

_____

b. Which ions have charges that are opposites?

_____

c. Which ion's charge is not the opposite of another ion's charge?

_____

Name the integer that meets the given description.

13. the opposite of −17 _____

14. 4 units left of 0 _____

15. the opposite of the opposite of 2 _____

16. 15 units right of 0 _____

17. 12 units right of 0 _____

18. the opposite of −19 _____

19. Analyze Relationships Several wrestlers are trying to lose weight for a competition. Their change in weight since last week is shown in the chart.

Wrestler	Tino	Victor	Ramsey	Baxter	Luis
Weight Change (in pounds)	−2	6	2	5	−5

a. Did Victor lose or gain weight since last week? _____

b. Which wrestler's weight change is the opposite of Ramsey's? _____

c. Which wrestlers have lost weight since last week? _____

d. Frankie's weight change since last week was the opposite of Victor's.

What was Frankie's weight change? _____

e. Frankie's goal last week was to gain weight. Did he meet his goal? Explain.

_____

Find the distance between the given number and its opposite on a number line.

20. 6 _____

21. −2 _____

22. 0 _____

23. −7 _____

24. **What If?** Three contestants are competing on a trivia game show. The table shows their scores before the final question.

Contestant	Score Before Final Question
Timothy	−25
Shawna	18
Kaylynn	−14

    a. How many points must Shawna earn for her score to be the opposite of Timothy's score before the final question? _____

    b. Which person's score is closest to 0? _____

    c. Who do you think is winning the game before the final question? Explain.

_____

H.O.T.   **FOCUS ON HIGHER ORDER THINKING**

Work Area

25. **Communicate Mathematical Ideas** Which number is farther from 0 on a number line: −9 or 6? Explain your reasoning.

_____

_____

26. **Analyze Relationships** A number is k units to the left of 0 on the number line. Describe the location of its opposite.

_____

_____

27. **Critique Reasoning** Roberto says that the opposite of a certain integer is −5. Cindy concludes that the opposite of an integer is always negative. Explain Cindy's error.

_____

_____

_____

28. **Multiple Representations** Explain how to use a number line to find the opposites of the integers 3 units away from −7.

_____

_____

_____

Comparing and Ordering Integers

? ESSENTIAL QUESTION

How do you compare and order integers?

**EXPLORE ACTIVITY** Real World

COMMON CORE 6.NS.7, 6.NS.7a

Comparing Positive and Negative Integers

The Westfield soccer league ranks its teams using a number called the "win/loss combined record." A team with more wins than losses will have a positive combined record, and a team with fewer wins than losses will have a negative combined record. The table shows the total win/loss combined record for each team at the end of the season.

Team	Sharks A	Jaguars B	Badgers C	Tigers D	Cougars E	Hawks F	Wolves G
Win/Loss Combined Record	0	4	−4	−6	2	−2	6

A Graph the win/loss combined record for each team on the number line.

```
<-+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+->
 −10 −9 −8 −7 −6 −5 −4 −3 −2 −1  0  1  2  3  4  5  6  7  8  9 10
```
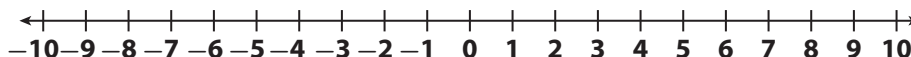
B Which team had the best record in the league? How do you know?

_____

C Which team had the worst record? How do you know?

_____

Reflect

1. **Analyze Relationships** Explain what the data tell you about the win/loss records of the teams in the league.

_____

_____

_____

_____

Ordering Positive and Negative Integers

When you read a number line from left to right, the numbers are in order from least to greatest.

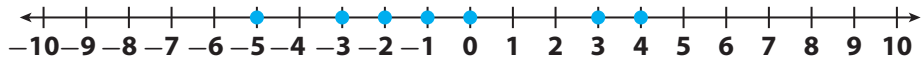## EXAMPLE 1   Real World

COMMON CORE   6.NS.7

Fred recorded the following golf scores during his first week at the golf academy. In golf, the player with the lowest score wins the game.

Day	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Score	4	−2	3	−5	−1	0	−3

Graph Fred's scores on the number line, and then list the numbers in order from least to greatest.

STEP 1   Graph the scores on the number line.

STEP 2   Read from left to right to list the scores in order from least to greatest.

The scores listed from least to greatest are −5, −3, −2, −1, 0, 3, 4.
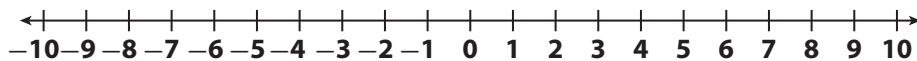
Math Talk
Mathematical Practices

What day did Fred have his best golf score? How do you know?

YOUR TURN

Graph the values in each table on a number line. Then list the numbers in order from greatest to least.
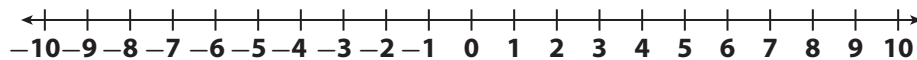
2.

Change in Stock Price ($)					
−5	4	0	−3	−6	2

_____

3.

Elevation (meters)							
9	−1	−6	2	−10	0	5	8

_____

Writing Inequalities

An **inequality** is a statement that two quantities are not equal. The symbols $<$ and $>$ are used to write inequalities.

- The symbol $>$ means "is greater than."
- The symbol $<$ means "is less than."

You can use a number line to help write an inequality.
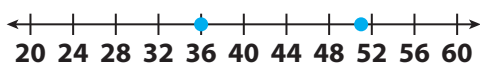

EXAMPLE 2 · Real World

COMMON CORE · 6.NS.7a, 6.NS.7b

A In 2005, Austin, Texas, received 51 inches in annual precipitation. In 2009, the city received 36 inches in annual precipitation. In which year was there more precipitation?

Graph 51 and 36 on the number line.

```
←─┼──┼──┼──┼──●──┼──┼──┼──●──┼──┼─→
  20 24 28 32 36 40 44 48 52 56 60
```

- 51 is to the *right* of 36 on the number line.

  This means that 51 is **greater than** 36.

  Write the inequality as $51 > 36$.

- 36 is to the *left* of 51 on the number line.

  This means that 36 is **less than** 51.

  Write the inequality as $36 < 51$.

  There was more precipitation in 2005.

B Write two inequalities to compare -6 and 7.
$-6 < 7; 7 > -6$

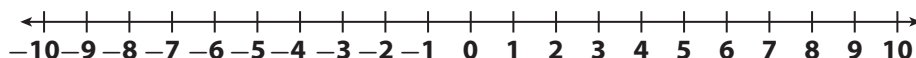**C** Write two inequalities to compare -9 and -4.
$-4 > -9; -9 < -4$

YOUR TURN

Compare. Write $>$ or $<$. Use the number line to help you.

4. -10 ◯ -2 **5.** -6 ◯ 6 **6.** -7 ◯ -8

```
←─┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──→
 −10−9 −8 −7 −6 −5 −4 −3 −2 −1  0  1  2  3  4  5  6  7  8  9 10
```

7. Write two inequalities to compare -2 and -18. _____

8. Write two inequalities to compare 39 and -39. _____

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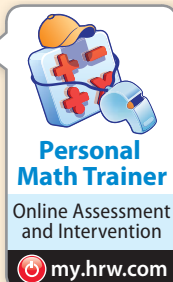
Guided Practice

1a. Graph the temperature for each city on the number line. (Explore Activity)

City	A	B	C	D	E
Temperature (°F)	−9	10	−2	0	4

−10 −9 −8 −7 −6 −5 −4 −3 −2 −1 0 1 2 3 4 5 6 7 8 9 10
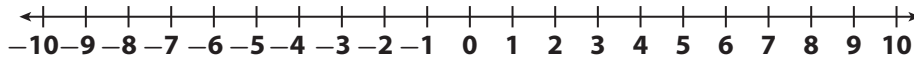
b. Which city was coldest? _____

c. Which city was warmest? _____

List the numbers in order from least to greatest. (Example 1)

2. 4, −6, 0, 8, −9, 1, −3

_____

3. −65, 34, 7, −13, 55, 62, −7

_____

4. Write two inequalities to compare −17 and −22. _____

Compare. Write < or >. (Example 2)

5. −9 ◯ 2

6. 0 ◯ 6

7. 3 ◯ −7

8. 5 ◯ −10

9. −1 ◯ −3

10. −8 ◯ −4

11. −4 ◯ 1

12. −2 ◯ −6

13. Compare the temperatures for the following cities. Write < or >. (Example 2)

City	Alexandria	Redwood Falls	Grand Marais	Winona	International Falls
Average Temperature in March (°C)	−3	0	−2	2	−4

a. Alexandria and Winona _____

b. Redwood Falls and International Falls _____

? ESSENTIAL QUESTION CHECK-IN

14. How can you use a number line to compare and order numbers?

_____

_____

_____

Name _____ Class _____ Date _____

1.2 Independent Practice

Personal Math Trainer

Online Assessment and Intervention

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15. Multiple Representations A hockey league tracks the plus-minus records for each player. A plus-minus record is the difference in even strength goals for and against the team when a player is on the ice. The following table lists the plus-minus values for several hockey players.

Player	A. Jones	B. Sutter	E. Simpson	L. Mays	R. Tomas	S. Klatt
Plus-minus	−8	4	9	−3	−4	3

a. Graph the values on the number line.

−10 −9 −8 −7 −6 −5 −4 −3 −2 −1 0 1 2 3 4 5 6 7 8 9 10
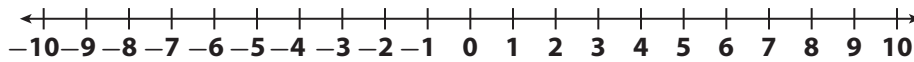
b. Which player has the best plus-minus record? _____

Astronomy The table lists the average surface temperature of some planets. Write an inequality to compare the temperatures of each pair of planets.

16. Uranus and Jupiter _____

17. Mercury and Mars _____

**18.** Arrange the planets in order of average surface temperature from greatest to least. _____

_____

Planet	Average Surface Temperature (°C)
Mercury	167
Uranus	−197
Neptune	−200
Earth	15
Mars	−65
Jupiter	−110

19. Represent Real-World Problems For a stock market project, five students each invested pretend money in one stock. They tracked gains and losses in the value of that stock for one week. In the following table, a gain is represented by a positive number and a loss is represented by a negative number.

Students	Andre	Bria	Carla	Daniel	Ethan
Gains and Losses ($)	7	−2	−5	2	4

Graph the students' results on the number line. Then list them in order from least to greatest.

a. Graph the values on the number line.

−10 −9 −8 −7 −6 −5 −4 −3 −2 −1 0 1 2 3 4 5 6 7 8 9 10
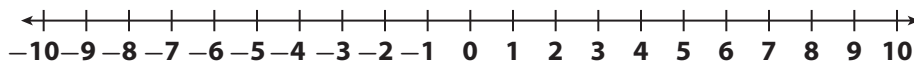
b. The results listed from least to greatest are _____ .

Geography The table lists the lowest elevation for several countries. A negative number means the elevation is below sea level, and a positive number means the elevation is above sea level. Compare the lowest elevation for each pair of countries. Write $<$ or $>$.

Country	Lowest Elevation (feet)
Argentina	-344
Australia	-49
Czech Republic	377
Hungary	249
United States	-281

20. Argentina and the United States _____

21. Czech Republic and Hungary _____

22. Hungary and Argentina _____

23. Which country in the table has the lowest elevation? _____

24. **Analyze Relationships** There are three numbers a, b, and c, where $a > b$ and $b > c$. Describe the positions of the numbers on a number line.

_____

_____

_____

_____

H.O.T. **FOCUS ON HIGHER ORDER THINKING**

Work Area

25. **Critique Reasoning** At 9 A.M. the outside temperature was $-3°$F. By noon, the temperature was $-12°$F. Jorge said that it was getting warmer outside. Is he correct? Explain.

_____

26. **Problem Solving** Golf scores represent the number of strokes above or below par. A negative score means that you hit a number below par while a positive score means that you hit a number above par. The winner in golf has the lowest score. During a round of golf, Angela's score was -5 and Lisa's score was -8. Who won the game? Explain.

_____

27. **Look for a Pattern** Order -3, 5, 16, and -10 from least to greatest. Then order the same numbers from closest to zero to farthest from zero. Describe how your lists are similar. Would this be true if the numbers were -3, 5, -16 and -10?

_____

_____

_____

_____
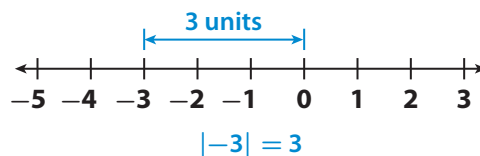
_____

? ESSENTIAL QUESTION

How do you find and use absolute value?

**EXPLORE ACTIVITY 1** **COMMON CORE** 6.NS.7, 6.NS.7c

Finding Absolute Value

The **absolute value** of a number is the number's distance from 0 on a number line. For example, the absolute value of -3 is 3 because -3 is 3 units from 0. The absolute value of -3 is written $|-3|$.

3 units

$-5\ -4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2\ \ 3$

$|-3| = 3$

Because absolute value represents a distance, it is always nonnegative.

Graph the following numbers on the number line. Then use your number line to find each absolute value.

$-7 \quad 5 \quad 7 \quad -2 \quad 4 \quad -4$

$-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5\ \ 6\ \ 7\ \ 8\ \ 9\ \ 10$
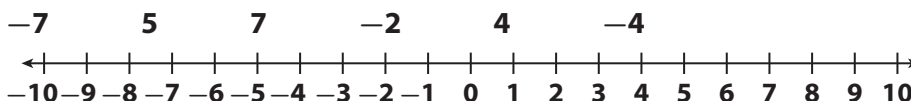
A $|-7| = $ _____ **B** $|5| = $ _____ **C** $|7| = $ _____

D $|-2| = $ _____ **E** $|4| = $ _____ **F** $|-4| = $ _____

Reflect

1. **Analyze Relationships** Which pairs of numbers have the same absolute value? How are these numbers related?

   _____

   _____

2. **Justify Reasoning** Negative numbers are less than positive numbers. Does this mean that the absolute value of a negative number must be less than the absolute value of a positive number? Explain.

   _____

   _____

   _____

   _____

Absolute Value In A Real-World Situation

In real-world situations, absolute values are often used instead of negative numbers. For example, if you use a $50 gift card to make a $25 purchase, the change in your gift card balance can be represented by −$25.
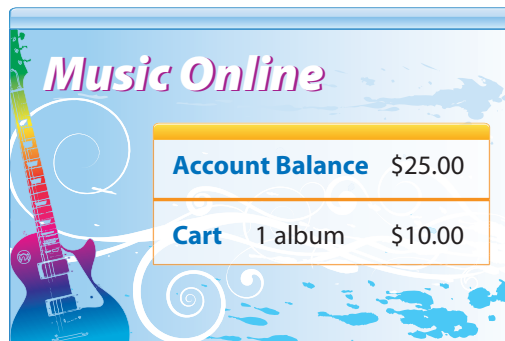
EXAMPLE 1   Real World

COMMON CORE 6.NS.7c

Jake uses his online music store gift card to buy an album of songs by his favorite band.

Find the negative number that represents the change in the balance on Jake's card after his purchase. Explain how absolute value would be used to express that number in this situation.
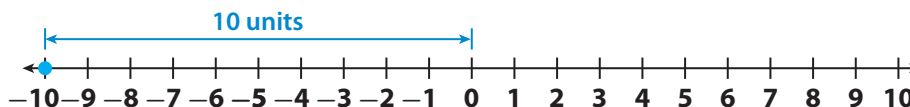
Music Online

Account Balance		$25.00
Cart	1 album	$10.00

STEP 1 Find the negative integer that represents the change in the balance.

−$10   *The balance decreased by $10, so use a negative number.*

_____

_____

STEP 2 Use the number line to find the absolute value of −$10.

−10 is 10 units from 0 on the number line.

10 units

The absolute value of −$10 is $10, or $|-10| = 10$.

The balance on Jake's card decreased by $10.
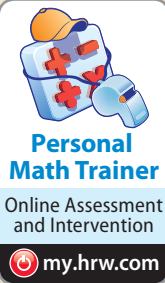
Reflect

3. Communicate Mathematical Ideas Explain why the absolute value of a number will never be negative.

_____

_____

_____

4. The temperature at night reached $-13\,°$F. Write an equivalent statement about the temperature using the absolute value of the number.

_____

Find each absolute value.

5. $|-12|$ _____ **6.** $|91|$ _____ **7.** $|-55|$ _____

8. $|0|$ _____ **9.** $|88|$ _____ **10.** $|1|$ _____

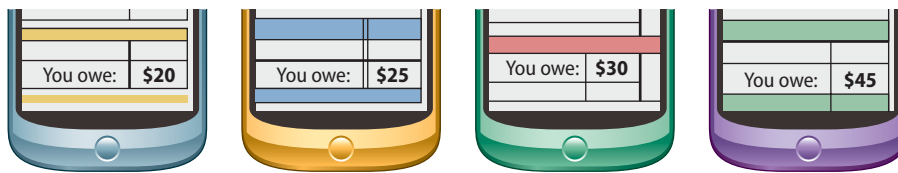**EXPLORE ACTIVITY 2** Real World **COMMON CORE** 6.NS.7c, 6.NS.7d

Comparing Absolute Values

You can use absolute values to compare negative numbers in real-world situations.

Maria, Susan, George, and Antonio checked their credit card balances on their smartphones. The amounts owed are shown.

| You owe: | $20 | | You owe: | $25 | | You owe: | $30 | | You owe: | $45 |

_____   _____   _____   _____

Answer the following questions. When you have finished, you will have enough clues to match each statement with the correct person.

Remember: When someone owes a positive amount of money, this means that he or she has a *negative* balance.

A Maria's credit card balance is less than $-\$30$. Does Maria owe more than $30 or less than $30? _____

B Susan's credit card balance is greater than $-\$25$. Does Susan owe more than $25 or less than $25? _____

C George's credit card balance is $5 less than Susan's balance. Does George owe more than Susan or less than Susan? _____

D Antonio owes $15 less than Maria owes. This means that Antonio's balance is _____ than Maria's balance.

**E** Write each person's name underneath his or her smartphone.

Reflect

11. Analyze Relationships Use absolute value to describe the relationship between a negative credit card balance and the amount owed.

_____

Guided Practice

1. Vocabulary If a number is _____, then the number is less than its absolute value. **(Explore Activity 1)**

2. If Ryan pays his car insurance for the year in full, he will get a credit of $28. If he chooses to pay a monthly premium, he will pay a $10 late fee for any month that the payment is late. **(Explore Activity 1, Example 1)**

   a. Which of these values could be represented with a negative number? Explain.

   _____

   _____

   b. Use the number line to find the absolute value of your answer from

   part a. _____

   $$-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\quad 0\quad 1\quad 2\quad 3\quad 4\quad 5\quad 6\quad 7\quad 8\quad 9\quad 10$$
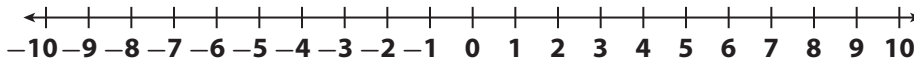
3. Leo, Gabrielle, Sinea, and Tomas are playing a video game. Their scores are described in the table below. **(Explore Activity 2)**

Name	Leo	Gabrielle	Sinea
Score	less than −100 points	20 more points than Leo	50 points less than Leo

   a. Leo wants to earn enough points to have a positive score. Does he need to earn more than 100 points or less than 100 points? _____

   b. Gabrielle wants to earn enough points to not have a negative score. Does she need to earn more points than Leo or less points than Leo? _____

   c. Sinea wants to earn enough points to have a higher score than Leo. Does she need to earn more than 50 points or less than 50 points? _____
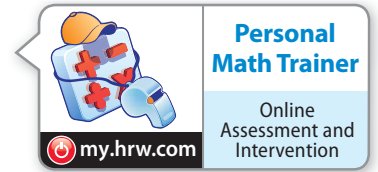
? ESSENTIAL QUESTION CHECK-IN

4. When is the absolute value of a number equal to the number?

_____

1.3 Independent Practice

COMMON CORE 6.NS.7, 6.NS.7c, 6.NS.7d

5. **Financial Literacy** Jacob earned $80 babysitting and deposited the money into his savings account. The next week he spent $85 on video games. Use integers to describe the weekly changes in Jacob's savings account balance.

_____

_____

6. **Financial Literacy** Sara's savings account balance changed by $34 one week and by −$67 the next week. Which amount represents the greatest

change? _____

7. **Analyze Relationships** Bertrand collects movie posters. The number of movie posters in his collection changes each month as he buys and sells posters. The table shows how many posters he bought or sold in the given months.

Month	January	February	March	April
Posters	Sold 20	Bought 12	Bought 22	Sold 28

a. Which months have changes that can be represented by positive numbers? Which months have changes that can be represented by negative numbers? Explain.

_____

_____

_____

_____

b. According to the table, in which month did the size of Bertrand's poster collection change the most? Use absolute value to explain your answer.

_____

_____

_____

8. **Earth Science** Death Valley has an elevation of −282 feet relative to sea level. Explain how to use absolute value to describe the elevation of Death Valley as a positive integer.

_____

_____

9. Communicate Mathematical Ideas Lisa and Alice are playing a game. Each player either receives or has to pay play money based on the result of their spin. The table lists how much a player receives or pays for various spins.

Red	Pay $5
Blue	Receive $4
Yellow	Pay $1
Green	Receive $3
Orange	Pay $2

a. Express the amounts in the table as positive and negative numbers.

_____

b. Describe the change to Lisa's amount of money when the spinner lands on red.

_____

_____

10. Financial Literacy Sam's credit card balance is less than −$36. Does Sam owe more or less than $36? _____

11. Financial Literacy Emily spent $55 from her savings on a new dress. Explain how to describe the change in Emily's savings balance in two different ways.

_____

_____

_____

**H.O.T. FOCUS ON HIGHER ORDER THINKING**

Work Area

12. Make a Conjecture Can two different numbers have the same absolute value? If yes, give an example. If no, explain why not.

_____

13. Communicate Mathematical Ideas Does $-|-4| = |-(-4)|$? Justify your answer.

_____

14. Critique Reasoning Angelique says that finding the absolute value of a number is the same as finding the opposite of the number. For example, $|-5| = 5$. Explain her error.
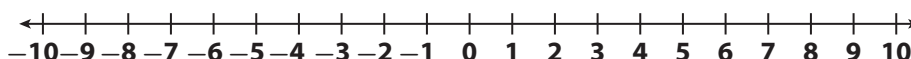
_____

_____

_____

_____

Ready to Go On?
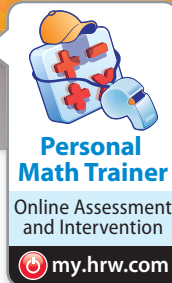
1.1 Identifying Integers and Their Opposites

1. The table shows the elevations in feet of several locations around a coastal town. Graph and label the locations on the number line according to their elevations.

Location	Post Office A	Library B	Town Hall C	Laundromat D	Pet Store E
Elevation (feet)	8	−3	−9	3	1

$$\overset{\longleftarrow}{\underset{-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\quad 0\quad 1\quad 2\quad 3\quad 4\quad 5\quad 6\quad 7\quad 8\quad 9\quad 10}{\rule{0pt}{0pt}}}\overset{\longrightarrow}{}$$

Write the opposite of each number.

2. −22 _____

3. 0 _____

1.2 Comparing and Ordering Integers

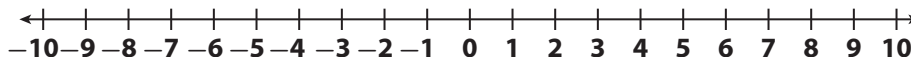**List the numbers in order from least to greatest.**

4. −2, 8, −15, −5, 3, 1 _____

Compare. Write < or >.

5. −3 ◯ −15

6. 9 ◯ −10

1.3 Absolute Value

Graph each number on the number line. Then use your number line to find the absolute value of each number.

$$\overset{\longleftarrow}{\underset{-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\quad 0\quad 1\quad 2\quad 3\quad 4\quad 5\quad 6\quad 7\quad 8\quad 9\quad 10}{\rule{0pt}{0pt}}}\overset{\longrightarrow}{}$$

7. 2 _____

8. −8 _____

9. −5 _____

? ESSENTIAL QUESTION

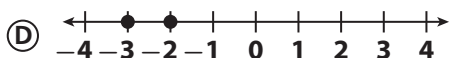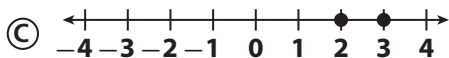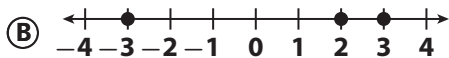**10.** How can you use absolute value to represent a negative number in a real-world situation?
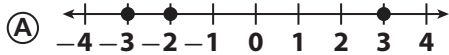
_____

_____

MODULE 1 MIXED REVIEW

Assessment Readiness

COMMON CORE

Personal Math Trainer

Online Assessment and Intervention

my.hrw.com

Selected Response

1. Which number line shows 2, 3, and −3?

Ⓐ
−4 −3 −2 −1 0 1 2 3 4

Ⓑ
−4 −3 −2 −1 0 1 2 3 4

Ⓒ
−4 −3 −2 −1 0 1 2 3 4

Ⓓ
−4 −3 −2 −1 0 1 2 3 4

2. What is the opposite of −3?

Ⓐ 3 Ⓒ $-\frac{1}{3}$

Ⓑ 0 Ⓓ $\frac{1}{3}$

3. Darrel is currently 20 feet below sea level. Which correctly describes the opposite of Darrel's elevation?

Ⓐ 20 feet below sea level

Ⓑ 20 feet above sea level

Ⓒ 2 feet below sea level

Ⓓ At sea level

4. Which has the same absolute value as −55?

Ⓐ 0 Ⓒ 1

Ⓑ −1 Ⓓ 55

5. In Bangor it is −3 °F, in Fairbanks it is −12 °F, in Fargo it is −8 °F, and in Calgary it is −15 °F. In which city is it the coldest?

Ⓐ Bangor Ⓒ Fargo

Ⓑ Fairbanks Ⓓ Calgary

6. Which shows the integers in order from least to greatest?

Ⓐ 20, 6, −2, −13 Ⓒ −13, −2, 6, 20

Ⓑ −2, 6, −13, 20 Ⓓ 20, −13, 6, −2

7. How would you use a number line to put integers in order from greatest to least?

Ⓐ Graph the integers, then read them from left to right.

Ⓑ Graph the integers, then read them from right to left.

Ⓒ Graph the absolute values of the integers, then read them from left to right.

Ⓓ Graph the absolute values of the integers, then read them from right to left.

Mini-Task

8. The table shows the change in the amounts of money in several savings accounts over the past month.

Account	Change
A	$125
B	−$45
C	−$302
D	$108

a. List the dollar amounts in the order in which they would appear on a number line from left to right.

_____

b. In which savings account was the absolute value of the change the greatest? Describe the change in that account.

_____

c. In which account was the absolute value of the change the least?

_____