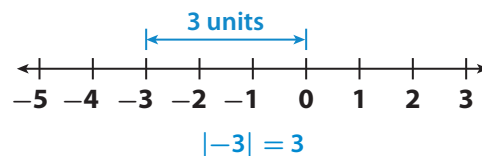**? ESSENTIAL QUESTION**

How do you find and use absolute value?
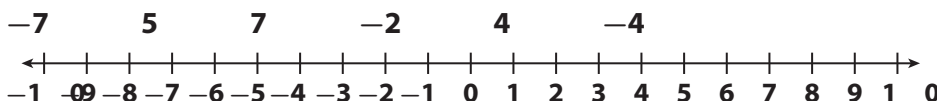
EXPLORE ACTIVITY 1   **TEKS** 6.2.B

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   5   7   −2   4   −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.
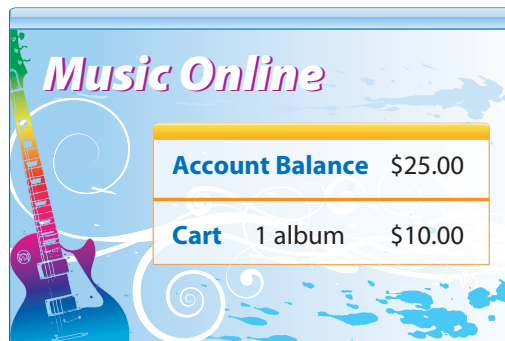
EXAMPLE 1 Real World

TEKS 6.2.B

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.
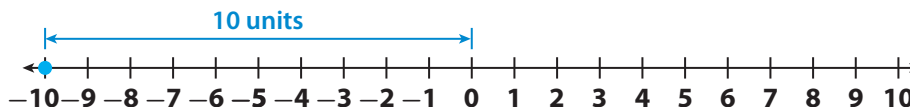
Music Online

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.
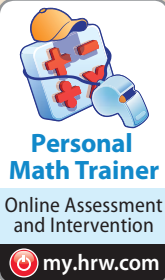
Reflect

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 🏴 **TEKS** 6.2.B

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.

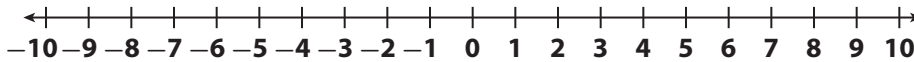**E** Write each person's name underneath his or her smartphone.

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 the amount from

part a. _____

$$-10 \;-9 \;-8 \;-7 \;-6 \;-5 \;-4 \;-3 \;-2 \;-1 \;\; 0 \;\; 1 \;\; 2 \;\; 3 \;\; 4 \;\; 5 \;\; 6 \;\; 7 \;\; 8 \;\; 9 \;\; 10$$

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

Personal Math Trainer

Online Assessment and Intervention

my.hrw.com

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

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.

_____

_____

_____

_____

Work Area

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