Objective: To compare rational numbers and their absolute values in context

When you compare numbers in real-world situations, you must decide whether to use their actual values or their absolute values. Absolute values represent the **magnitude**, or size, of numbers.

Bruce and Jean are at the foot of a cliff.
Jean explores a cave to a level of 85 feet below ground.
Bruce climbs to the top of the cliff at a level of 78 feet above ground.

▶ You can use integers to describe Bruce's and Jean's changes in level.

Jean went down 85 feet, so −85 describes her change.
Bruce went up 78 feet, so +78 describes his change.

To answer the following questions think about the meaning of the integers.

Who went to a greater level? Compare the integers.	Who made a greater change in level? Compare the absolute values.
$-85 < 78$	$\lvert -85 \rvert > \lvert 78 \rvert$

Think
The value of −85 is less than the value of 78.

Think
The magnitude of −85 is greater than the magnitude of 78.

Bruce went to a greater level.   Jean made a greater change.

Practice

Write an inequality to represent the situation. Explain your reasoning.

1. A 15-yard penalty covers more distance than a 5-yard gain.

_____

_____

_____

_____

2. 3°F below 0 is colder than 5°F.

_____

_____

_____

_____

Discuss and Write

3. The absolute value of a number tells its magnitude, or size. Explain why the magnitudes of −3 and 3 are the same.

Practice

Write an inequality to represent the situation.

4. A diver 20 feet underwater is closer to the surface than a glider 50 feet above the water.

_____

5. A balance of −$15 is greater than a balance of −$40.

_____

6. A temperature of −6°F is colder than a temperature of −1°F.

_____

7. A person who gains 4 pounds is more pounds from his original weight than a person who loses 2 pounds.

_____

8. The magnitude of a $100 charge is greater than a $50 credit.

_____

9. The magnitude of a 5-yard gain and a 5-yard loss are the same.

_____

Complete the statement by writing *more* or *less*.

10. Alan's credit card balance is less than −$156. Alan owes the credit card company _____ than $156.

11. The balloonist soared to a height greater than +156 feet. The balloon went _____ than 156 feet.

12. The temperature last night was below 68° F. The temperature was _____ than 68° F.

13. A diver went down to below −50 feet. She went _____ than 50 feet down.

Problem Solving

Describe a situation that the inequality could represent.

14. $|-10| < |-25|$

_____

15. $|-20| = 20$

_____

16. $-3 < -2$

_____

17. $5 > -7$

_____

Explain Your Reasoning

18. Melanie's account balance is less than −$50. Does she owe more or less than $50? Explain.

C For additional Practice, go to page 276 in this Workbook. Then go to Lesson 5-3, pages 154–155 in the Student Book.