

## Lesson 10: Writing and Interpreting Inequality Statements Involving Rational Numbers

### Classwork

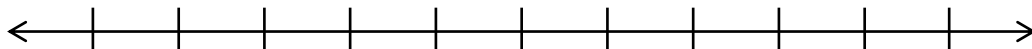
#### Opening Exercise

“The amount of money I have in my pocket is less than \$5 but greater than \$4.”

- One possible value for the amount of money in my pocket is \_\_\_\_\_.
- Write an inequality statement comparing the possible value of the money in my pocket to \$4.
- Write an inequality statement comparing the possible value of the money in my pocket to \$5.

#### Exercises 1–4

- Graph your answer from the Opening Exercise, part (a) on the number line below.
- Also graph the points associated with 4 and 5 on the number line.
- Explain in words how the location of the three numbers on the number line supports the inequality statements you wrote in the Opening Exercise, parts (b) and (c).
- Write one inequality statement that shows the relationship among all three numbers.



**Example 1: Writing Inequality Statements Involving Rational Numbers**

Write one inequality statement to show the relationship between the following shoe sizes:  $10\frac{1}{2}$ , 8, and 9.

- a. From least to greatest:
- b. From greatest to least:

**Example 2: Interpreting Data and Writing Inequality Statements**

Mary is comparing the rainfall totals for May, June, and July. The data is reflected in the table below. Fill in the blanks below to create inequality statements that compare the *Changes in Total Rainfall* for each month (the right-most column of the table).

Month	This Year's Total Rainfall (in inches)	Last Year's Total Rainfall (in inches)	Change in Total Rainfall from last year to this year (in inches)
May	2.3	3.7	-1.4
June	3.8	3.5	0.3
July	3.7	3.2	0.5

Write one inequality to order the Changes in Total Rainfall \_\_\_\_\_  
 From least to greatest                      From greatest to least

In this case, does the greatest number indicate the greatest change in rainfall? Explain.

**Exercises 5–8**

5. Mark's favorite football team lost yards on two back-to-back plays. They lost 3 yards on the first play. They lost 1 yard on the second play. Write an inequality statement using integers to compare the forward progress made on each play.
6. Sierra had to pay the school for two textbooks that she lost. One textbook cost \$55 and the other cost \$75. Her mother wrote two separate checks for each expense. Write two integers that represent the change to her mother's checking account balance. Then write an inequality statement that shows the relationship between these two numbers.
7. Jason ordered the numbers  $-70$ ,  $-18$ , and  $-18.5$  from least to greatest by writing the following statement:  
 $-18 < -18.5 < -70$ .  
Is this a true statement? Explain.
8. Write a real-world situation that is represented by the following inequality:  $-19 < 40$ . Explain the position of the numbers on a number line.

**Exercise 9: A Closer Look at the Sprint**

9. Look at the following two examples from the Sprint.

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$-\frac{1}{4}, -1, 0$				
<input type="text"/>	>	<input type="text"/>	>	<input type="text"/>
$-\frac{1}{4}, -1, 0$				

- Fill in the numbers in the correct order.
- Explain how the position of the numbers on the number line supports the inequality statements you created.
- Create a new pair of *greater than* and *less than* inequality statements using three other rational numbers.

**Problem Set**

For each of the relationships described below, write an inequality that relates the rational numbers.

1. Seven feet below sea level is farther below sea level than  $4\frac{1}{2}$  feet below sea level.
2. Sixteen degrees Celsius is warmer than zero degrees Celsius.
3. Three and one-half yards of fabric is less than five and one-half yards of fabric.
4. A loss of \$500 in the stock market is worse than a gain of \$200 in the stock market.
5. A test score of 64 is worse than a test score of 65, and a test score of 65 is worse than a test score of  $67\frac{1}{2}$ .
6. In December the total snowfall was 13.2 inches, which is more than the total snowfall in October and November, which was 3.7 inches and 6.15 inches, respectively.

For each of the following, use the information given by the inequality to describe the relative position of the numbers on a horizontal number line.

7.  $-0.2 < -0.1$
8.  $8\frac{1}{4} > -8\frac{1}{4}$
9.  $-2 < 0 < 5$
10.  $-99 > -100$
11.  $-7.6 < -7\frac{1}{2} < -7$

Fill in the blanks with numbers that correctly complete each of the statements.

12. Three integers between  $-4$  and  $0$                        $\underline{\quad < \quad < \quad}$
13. Three rational numbers between  $16$  and  $15$                        $\underline{\quad < \quad < \quad}$
14. Three rational numbers between  $-1$  and  $-2$                        $\underline{\quad < \quad < \quad}$
15. Three integers between  $2$  and  $-2$                        $\underline{\quad < \quad < \quad}$