Teacher Notes.

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."

a. One possible value for the amount of money in my pocket is \$4.75. (Answers Vary)

b. Write an inequality statement comparing the possible value of the money in my pocket to \$4.

\$4.00 < \$4.75

c. Write an inequality statement comparing the possible value of the money in my pocket to \$5.

\$4.75 < \$5.00

\$4.00 < \$4.75 < \$5.00

Exercises 1–4

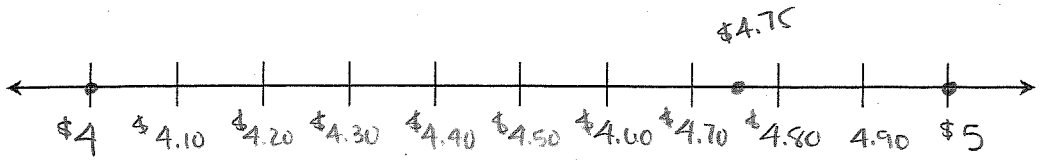
1. Graph your answer from the Opening Exercise part (a) on the number line below.

2. Also, graph the points associated with 4 and 5 on the number line.

3. 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).

The numbers are listed from least to greatest when I look at the number line from left to right. So, 4 is less than 4.75 is less than 5.

4. 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 among the following shoe sizes: $10\frac{1}{2}$, 8, and 9.

a. From least to greatest:

$8 < 9 < 10\frac{1}{2}$

b. From greatest to least:

$10\frac{1}{2} > 9, 8$

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: $-1.4 < 0.3 < 0.5$ (From least to greatest) $0.5 > 0.3 > -1.4$ (From greatest to least)

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

NO; The greatest change is for the month of May since the average total rainfall went down from last year by 1.4 inches, but the greatest number in the inequality statement is 0.5.

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.

$-3 < -1$

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.

-55 and -75

$-55 > -75$

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.

No; $18 < 18.5 < 70$ So the opposite of these numbers are in the opposite order.

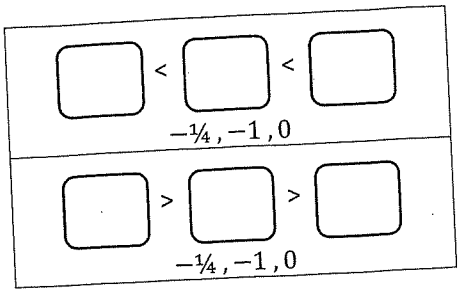
$-70 < -18.5 < 18$.

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.

The coldest temperature in January was $-19°$ F, & The warmest temperature was $40°$ F. This means that $40°$ F is warmer than $-19°$ F.

Exercise 9: A Closer Look at the Sprint

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



a. Fill in the numbers in the correct order.

$-1 < -1/4 < 0$ and $0 > -1/4 > -1$

b. Explain how the position of the numbers on the number line supports the inequality statements you created.

−1 is furthest left on the number line, so it is the least value. 0 is farthest to the right. −1/4 is in between.

c. Create a new pair of greater than and less than inequality statements using three other rational numbers.

Ans. vary. $8 > 0.5 > -1.8$ and $-1.8 < 0.5 < 8$.