Warm-Up

Plot each number on a number line. Then, insert a > or < symbol to make each inequality statement true.

number line: 0 1 2 3 4 5 6 7 8 9 10

1. 6.6 _____ 7.06

23. 7.852 _____ 7.8

Once you have completed the warm-up continue with the lesson, Do Not wait

Number lines can also be vertical, like a thermometer or a measure of elevation.
1. Discuss and write a sentence to describe the meaning of each statement.

a. The weather forecaster predicts the temperature will be below zero.

b. A submarine travels at 3000 feet below sea level.

c. Badwater Basin in Death Valley, California, is 86 meters below sea level.

2. Mark each temperature on the thermometer shown.

a. The highest temperature on record in the United States is 134°F. It occurred in 1913 in Death Valley, California.

b. The lowest temperature on record is −80°F. It occurred at Prospect Creek Camp, Alaska.

c. The lowest temperature recorded in the contiguous 48 states is −70°F. It occurred in Montana.

d. The highest winter average temperature in the United States is 78°F, which occurs in Honolulu, Hawaii.
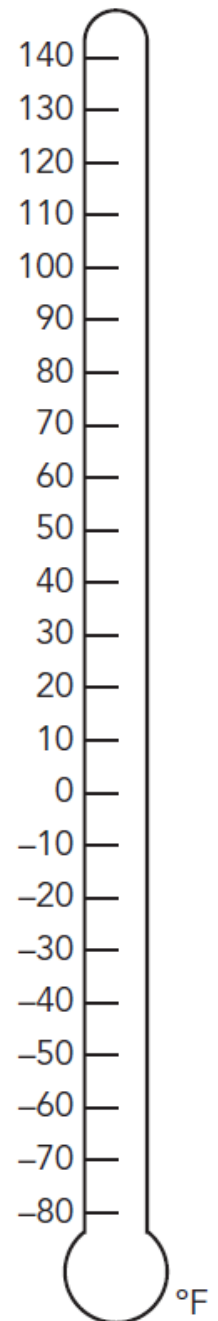
3. Which is colder, the lowest temperature recorded in Alaska or the lowest temperature recorded in Montana? How do you know?

4. Yadi and Eric were comparing 25 degrees to −27 degrees.

• Yadi wrote 25 < −27 and justifi ed her comparison by stating that the further a number is from zero, the greater the number.
• Eric wrote 25 > −27 and justifi ed his comparison by stating that the greater temperature will be above the second temperature on a thermometer.

Who is correct? Explain your choice.

5. Plot each set of temperatures on the thermometer. Then insert a < or > symbol to make each number sentence true.

a. −26°F _____ −31°F

b. −6°F _____ −17°F

c. −9°F _____ 8°F

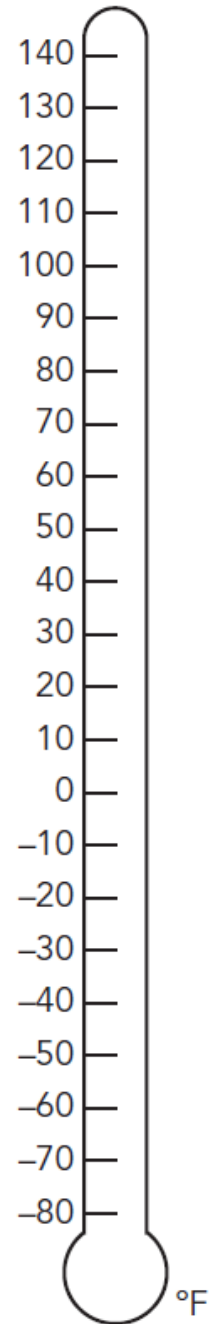6. Order the temperatures from least to greatest.

25°F   −33°F   0°F   105°F   −40°F   −5°F   67°F

Comparing and Ordering Rational Numbers

Helen and Grace started a company called Top Notch. They check the company's bank balance at the end of each week. The table shown represents the fi rst 10 weeks of operation. Overdrafts, or weeks when they owe the bank money, are represented by amounts within parentheses. For example, ($25) denotes an overdraft of $25; they owe the bank $25. Amounts that are not in parentheses are when they made money.

Week	1	2	3	4	5	6	7	8	9	10
Balance	$159	($201)	$231	($456)	($156)	($12)	$281	$175	$192	$213
+/– Number										

-450 -400 -350 -300 -250 -200 -150 -100 -50 0 50 100 150 200 250
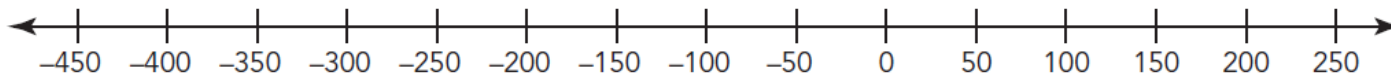
1. Use the table and number line to answer each question.

a. Write each as a positive or negative number and then plot the number on the number line.

b. What does 0 represent in this situation?

c. In which week did they have the highest bank balance?

d. In which week did they show greatest overdraft?

2. For each pair of weeks, write an inequality statement to compare the positive and negative numbers. Interpret the statement in context.

a. Week 1 and Week 5 		b. Week 4 and Week 6

You can compare different types of numbers by plotting the numbers on a number line.

3. Use the number line to answer each question.

a. Plot each value on the number line.

$-6\frac{2}{3}$ -20 0 10.5 $-17\frac{1}{2}$ -7.98 12 -3 -13
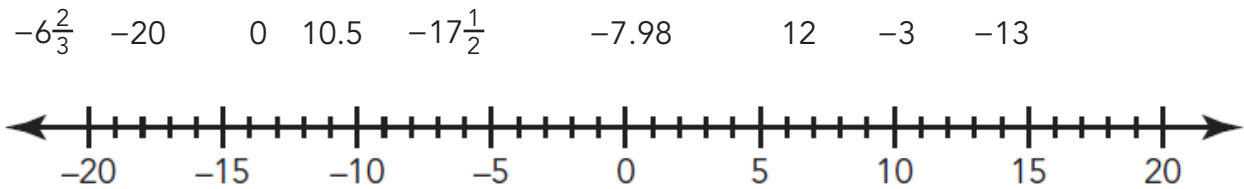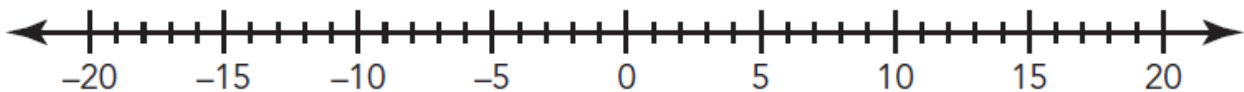

b. Which of the numbers has the least value?
How do you know?

c. Which of the numbers has the greatest value?
How do you know?

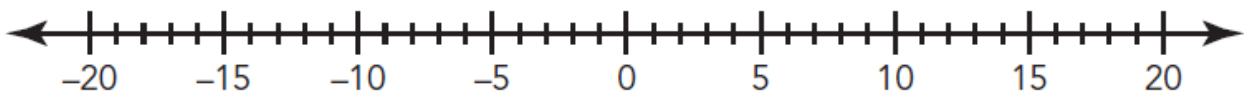d. Order the numbers from least to greatest.

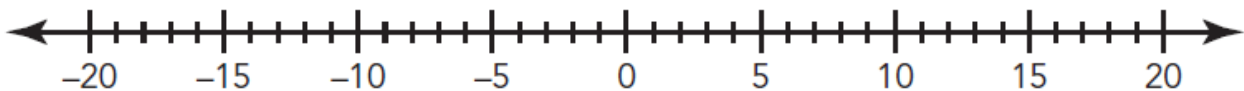4. Plot each rational number on the number line. Then, insert a >, <, or = symbol to make each number sentence true.

a. -10.25 _____ $-15\frac{2}{3}$

b. -17 _____ -17

c. $5\frac{2}{3}$ _____ -8.28

Putting It All Together

1. What does 0 mean on a number line?

2. What does opposite mean in terms of a number line?

3. Compare the types of numbers. Use what you know about number lines to explain your reasoning.

a. Which is greater—a negative or a positive rational number?

b. Which is greater—zero or any positive rational number?

c. Which is greater—zero or any negative rational number?

d. How do you decide which of two numbers is greater if both numbers are positive?

e. How do you decide which of two numbers is greater if both numbers are negative?

Homework HW

LESSON 10.1b
Human Number Line

Objective   Introduction to Negative Numbers

Practice

1. The Ravine Flyer II is a steel and wood roller coaster that takes advantage of the terrain in Erie, PA, to make the ride more exciting. Although the coaster is only 80 feet high, it follows the line of a cliff in order to drop to 235 feet (0 represents the height of the cliff).

a. Plot the highest and lowest points of the roller coaster on a vertical number line.

b. Explain why a vertical number line better represents the problem context than a horizontal number line.

c. How many total feet does the roller coaster drop?

2. An amusement park wants to design a coaster that rises 60 feet above ground and then drops the same distance below ground through a tunnel. Represent the underground depth with a number, and explain its relationship with the above ground height.

3. The Monster is a roller coaster that uses a design similar to the Ravine Flyer II. The Monster reaches a height of 120 feet, but then drops to 225 feet. Order the highest and lowest points of the two roller coasters from least to greatest.