TOPIC 10

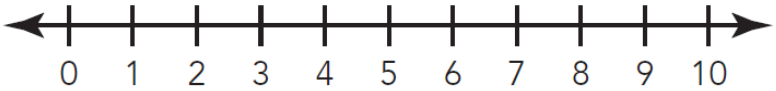
LESSON 10.1a

Human Number Line

Objective: Introduction to Negative Numbers

Warm-Up

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



1. 5.6 _____ 5.06

23. 7.65 _____ 6.75

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

Number Line Geography

1. What do you know about a number line?

2. Label the number line and be sure to include 0. Then plot and label a single point of your choice on the number line.

a. Draw a ray, or an arrow, beginning at your point to represent the numbers larger than the value at your point.

b. Draw a ray, or an arrow, beginning at your point to represent the numbers smaller than the value at your point.

c. At the ends of a number line, there are arrows going in both directions. What do these arrows indicate?

d. What do you think is on the number line to the left of 0?

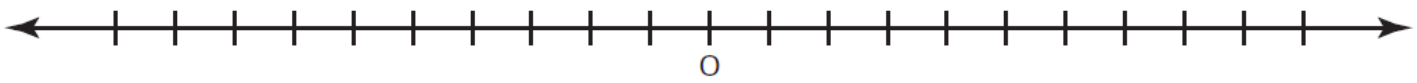
EXPLORE 1

Investigating Time on a Number Line

Let's use a number line to represent time.

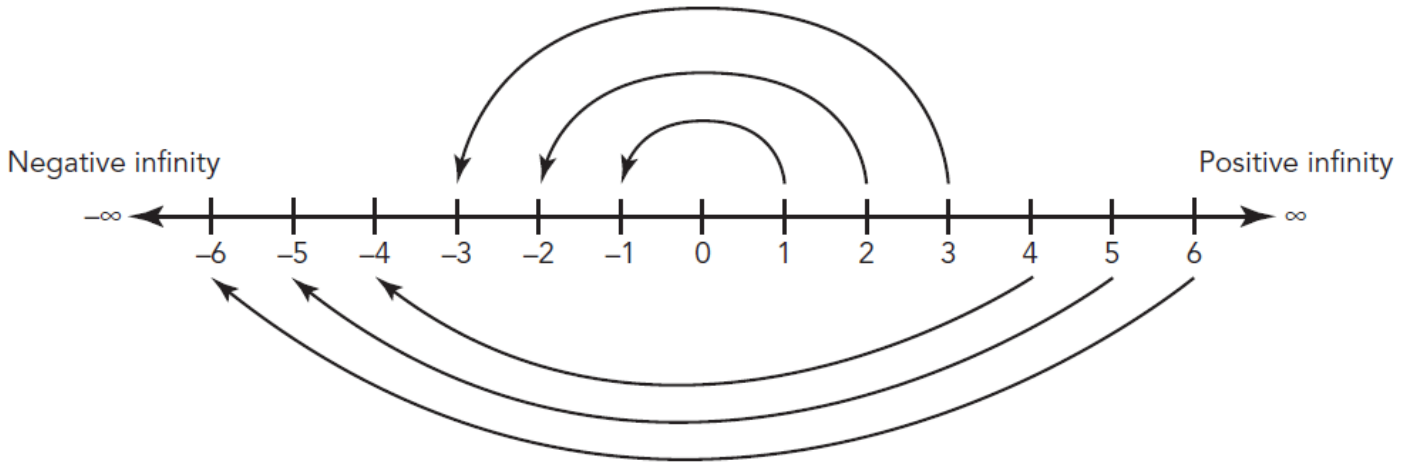
Your teacher will assign students to participate in the activity. Be sure to record what happens on the number line.

1. For each student, plot and label the point where the student stands on the number line. Also identify what time is represented by the point.



Student A: Stand at 0 to represent the time right now.
Student B: Stand at the point that represents 3 hours from now.
Student C: Stand at the point that represents 3 hours ago.
Student D: Stand at the point that represents 5 hours from now.
Student E: Stand at the point that represents 2 hours ago.
Student F: Stand at the point that represents 7 hours ago.

A number line can be created by refl ecting the positive numbers across zero. The values to the left of zero on the number line are called negative numbers and are labeled with a negative sign. The positive values extend to positive infinity, and the negative numbers extend to negative infinity. Infi nity, represented by the symbol ∞, means a quantity with no end or bound. The number line goes on forever in both directions!



2. Describe the change in the values of the numbers as you move to the right on the number line.

3. Describe the change in the values of the numbers as you move to the left on the number line.

Consider your class time number line.
4. Describe the locations of the points that represent time in the future.

5. Describe the locations of the points that represent time in the past.

6. How would your number line be labeled differently from one created by a class that starts at a different time?

7. What observations can you make about where a given number of hours before or after time 0 is plotted? What do you notice about its distance from 0? For example, what do you notice about 3 hours before and 3 hours after now? Or 6 hours before and 6 hours after now?

EXPLORE 2

Representing Opposites on a Number Line

Let's think more about both sides of 0 on a number line.

Mr. Gilbes will model a number line.

1. Create and label a number line according to the model.

2. Plot and label the location where each student stands on the number line. In the table, identify the value represented by the location where the student is standing.

Student A: Stand at 0.
Student B: Stand at 4.5.
Student C: Stand at the opposite of 4.5.
Student D: Stand at −6.
Student E: Stand at the opposite of −6.
Student F: Stand at a location between 2 and 3.
Student G: Stand at the location that is the opposite of Student F.

Student	Value
A	
B	
C	
D	
E	
F	
G	

3. Describe the number line relationship of the students who were opposites of each other.

Opposite numbers are refl ections of each other across 0 on the number line.

- The opposite of a positive number is a corresponding negative number.
- The opposite of a negative number is a corresponding positive number.

Attaching a negative sign to a number means refl ecting that number across 0 on the number line.

4. Use symbols to represent the opposite of 4.5 and the value it represents.

$$-(4.5) = \_\_\_\_\_$$

5. Use symbols to represent the opposite of −6 and the value it represents.

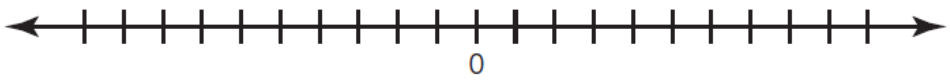
$$-(-6) = \_\_\_\_\_$$

6. What do you notice about the distance from 0 of corresponding opposite numbers?

7. What is the opposite of 0?

8. Name the opposite of each number. Then, plot each number and its opposite on the number line.

a. $1\frac{1}{2}$ b. −5 c. −9.9



EXPLORE 3

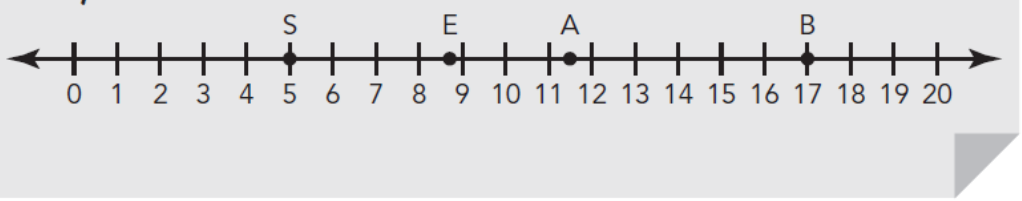
Representing Money on a Number Line

Alyson and her friends are trying to decide if they can go to the movies. Each ticket costs $9.00. After checking their wallets, each friend comments on how much money they have.

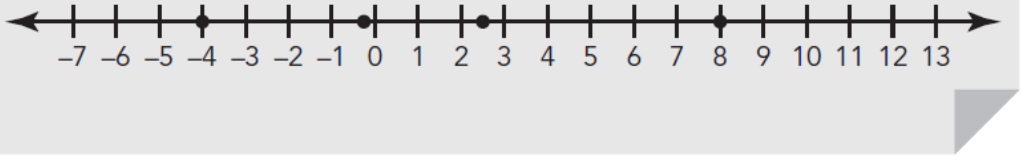
- Alyson: I have $2.50 more than the movie costs.
- Sharon: Oh, I don't have enough money. I'm $4.00 short.
- Brian: Not only can I buy a ticket, but I have just enough money to buy the $8.00 snack combo!
- Eileen: If I can find one more quarter, I can go.

Myron and Paulie created different number lines to represent the scenario.

Myron



Paulie



Analyze each representation of the scenario.

1. What does each point represent on Myron's number line?

2. What does each point represent on Paulie's number line?

3. Myron and Paulie are thinking about 0 differently. Explain what 0 represents on each number line.

4. Suppose the four friends decide to go to a matinee instead, where the ticket price is $7.50.

a. How would Myron's number line change?

b. How would Paulie's number line change?

Name: _____ Date: _____ Class: _____

Homework HW

LESSON 10.1a
Human Number Line

Objective

Introduction to Negative Numbers

Review

Name the two quantities that are changing in each and determine which quantity is the dependent quantity and which is the independent quantity.

1. Terrence types 80 words per minute.

2. To determine the total weekly wages of his employees, Mr. Jackson multiplies the total number of hours his employees work by $12.

3. A mountain climber is ascending a mountain at a rate of 5 feet per minute. Defi ne variables and write an equation that represents the situation. Graph the equation on a coordinate plane.

Perfrome the indicated operations

4. $11\frac{4}{5} + 5\frac{2}{3}$

5. $\frac{27}{4} \div \frac{3}{2}$