CC Investigation 3: Integers and the Coordinate Plane
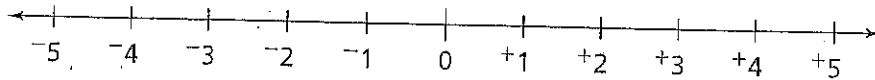
Negative numbers are needed when quantities are less than zero, such as very cold temperatures. Temperatures in winter go below 0°F in some locations. An altitude of 0 feet is referred to as sea level, but there are places in the world that are below sea level.

The counting numbers and zero are called **whole numbers**. The first six whole numbers are 0, 1, 2, 3, 4, and 5. You can extend a number line to the left past zero.

The opposite of a positive number is a **negative number**. For example, the number ⁻2 is the **opposite** of ⁺2. The set of whole numbers and their opposites are called **integers**.

Problem 3.1

Emily, Juan, Sahil, Cora, and Austin play a Question and Answer game. A player steps forward for a correct answer, but steps backward for an incorrect answer. During the first round, Sahil takes five steps backward. Juan takes three steps forward. Emily takes three steps backward. Austin does not move. Cora takes two steps backward.

A. 1. Which integer describes Austin's position in the game?

2. Draw a number line. Represent each player's position on the number line.

3. Who is in last place?

4. Which players are represented by opposites?

B. 1. In the next round each player moves two steps forward. Place all five players on a new number line.

2. Are any players who were opposites before still opposites now? Why or why not?

3. What does it mean when you read the numbers on the number line from the left to the right?

4. Which player is at the opposite of Cora? Explain.

C. In the final round, Emily stays in the same place, and Sahil is at her opposite. How many steps did Sahil take in the final round?