

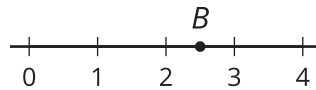


# Comparing Positive and Negative Numbers

Let's compare numbers on the number line.

## 2.1 A Point on the Number Line

Which of the following numbers could be represented by point  $B$ ?



2.45

 $\frac{2}{5}$  $\frac{5}{2}$  $\frac{35}{10}$ 

2.11

-2.5

## 2.2 Comparing Temperatures

Here are the low temperatures, in degrees Celsius, for a week in Anchorage, Alaska.

| day         | Mon | Tue | Wed  | Thurs | Fri | Sat | Sun |
|-------------|-----|-----|------|-------|-----|-----|-----|
| temperature | 5   | -1  | -5.5 | -2    | 3   | 4   | 0   |

1. Plot the temperatures on a number line.
2. Which day of the week had the lowest low temperature?
3. On a winter day, the low temperature in Anchorage, Alaska, was  $-21$  degrees Celsius, and the low temperature in Minneapolis, Minnesota, was  $-14$  degrees Celsius.

Jada said, "I know that 14 is less than 21, so  $-14$  is also less than  $-21$ . This means that it was colder in Minneapolis than in Anchorage."

Do you agree? Explain your reasoning.



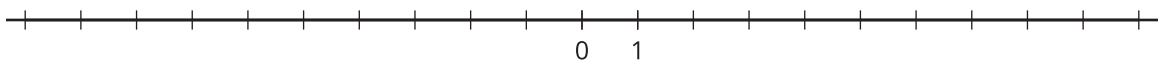
### Are you ready for more?

Another temperature scale frequently used in science is the *Kelvin scale*. In this scale, 0 K is the lowest possible temperature of anything in the universe, and it is  $-273.15$  degrees in the Celsius scale. Each 1 K is the same as  $1^{\circ}\text{C}$ , so 10 K is the same as  $-263.15^{\circ}\text{C}$ .

1. Water boils at  $100^{\circ}\text{C}$ . What is this temperature in K?
2. Ammonia boils at  $-35.5^{\circ}\text{C}$ . What is the boiling point of ammonia in K?
3. Explain why only positive numbers (and 0) are needed to record temperature in K.

## 2.3 Rational Numbers on a Number Line

1. Plot the numbers -2, 4, -7, and 10 on the number line. Label each point with its numeric value.



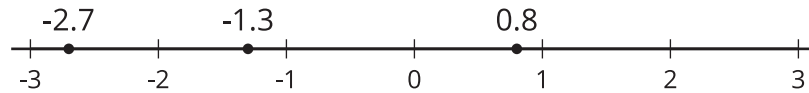
2. Decide whether each inequality statement is true or false. Be prepared to explain your reasoning.
  - a.  $-2 < 4$
  - b.  $-2 < -7$
  - c.  $4 > -7$
  - d.  $-7 > 10$

## Lesson 2 Summary

The symbol “>” means “is greater than.” The symbol “<” means “is less than.”

A statement that uses these symbols to compare two values or expressions is called an **inequality**.

The phrases “greater than” and “less than” can be used to compare numbers on the number line. For example, the numbers -2.7, 0.8, and -1.3, are shown on the number line.



Because -2.7 is to the left of -1.3, we say that -2.7 is less than -1.3. We write:

$$-2.7 < -1.3$$

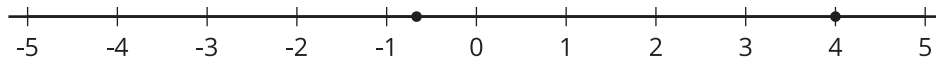
In general, any number that is to the left of a number  $n$  is less than  $n$ .

We can see that -1.3 is greater than -2.7 because -1.3 is to the right of -2.7. We write:

$$-1.3 > -2.7$$

In general, any number that is to the right of a number  $n$  is greater than  $n$ .

Here is another labeled number line with some **rational numbers**. A rational number is a number that can be written as a positive or negative fraction or zero.



The number 4 is positive, and its location is 4 units to the right of 0 on the number line. The number 4 can be written as  $\frac{4}{1}$  or  $\frac{16}{4}$  or any other equivalent fraction.

The number  $-\frac{2}{3}$  is negative, and its location is  $\frac{2}{3}$  units to the left of 0 on the number line.