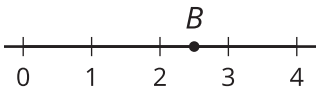
Comparing Positive and Negative Numbers

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°C, so 10 K is the same as -263.15°C.

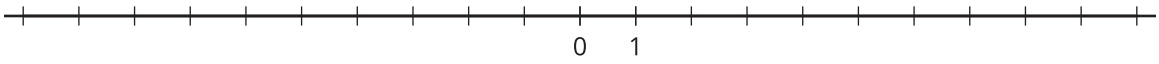
1. Water boils at 100°C. What is this temperature in K?

2. Ammonia boils at -35.5°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.

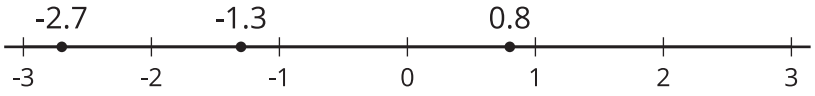


2. Decide whether each inequality statement is true or false. Be prepared to explain your reasoning.
   a. $-2 < 4$
   b. $-2 < -7$
   c. $4 > -7$
   d. $-7 > 10$

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:

$$-2.7 < -1.3$$

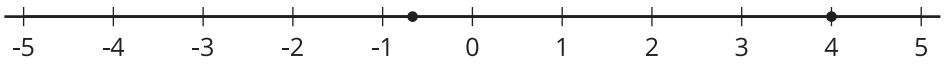
In general, any number that is to the left of a number n is less than n.

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.