

Grade 6 - Integers and Rational Numbers on the Number Line - Lesson

Common Core 6.NS.C.5, 6.NS.C.6a, 6.NS.C.6c · maths-pdf.fr/en/

Positive and negative numbers describe opposite directions from zero, such as above and below sea level. Opposites are the same distance from 0 on the other side, so the opposite of 3 is -3. Integers are whole numbers and their opposites, and rational numbers add fractions and decimals. All can be placed on a number line.

Grade 6 · Common Core State Standards: **6.NS.C.5, 6.NS.C.6a, 6.NS.C.6c**

Key facts

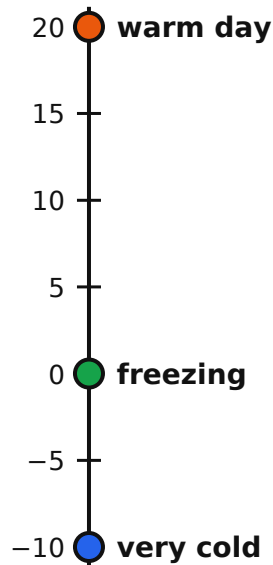
- Positive numbers are above zero or to the right; negative numbers are below zero or to the left.
- Opposites are the same distance from 0 on opposite sides.
- The opposite of the opposite of a number is the number itself.
- Integers are whole numbers and their opposites; rational numbers include fractions and decimals.
- A vertical number line, like a thermometer, puts positive numbers on top.

What are positive and negative numbers?

Positive numbers describe amounts above zero, like 20 degrees on a warm day. Negative numbers describe amounts below zero, like a diver 25 feet below sea level or a bank balance that is overdrawn. Zero is neither positive nor negative.

Integers and rational numbers

The **integers** are the whole numbers and their opposites: -3, -2, -1, 0, 1, 2, 3 and so on. The **rational numbers** are all numbers that can be written as a fraction, such as $-\frac{1}{2}$, 2.5, and -7.



A thermometer is a vertical number line.

How do you use integers to describe real situations?

Choose zero to mean "no change," then use a positive number for one direction and a negative number for the other. A deposit of \$60 is $+60$, and a payment of \$40 is -40 .

Deposit

+60

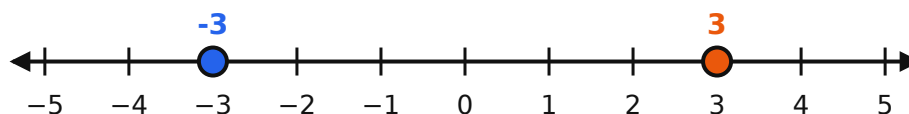
Bill

-40

Positive and negative integers describe opposite changes.

What are opposites?

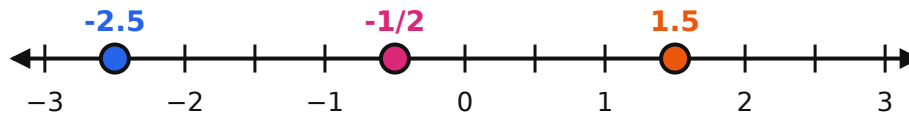
Two numbers are **opposites** if they are the same distance from 0 on opposite sides. The opposite of 3 is -3 , and the opposite of -3 is 3. The opposite of 0 is 0. Writing $-(-3)=3$ means the opposite of the opposite is the original number.



The opposites -3 and 3 are the same distance from 0.

How do you graph rational numbers on a number line?

1. Draw a line, mark 0, and choose a scale.
2. Mark equal intervals; positive numbers go to the right, negative to the left.
3. For a fraction or decimal, split each unit into equal parts.
4. Place a point and label it.



Rational numbers include fractions and decimals.

Rational numbers describe many real measurements: a temperature of -2.5 degrees, an elevation of $-\frac{3}{4}$ mile in a canyon, or a golf score below par. Always read the sign first, then the size. The sign tells the direction from zero, and the size tells the distance from zero.

The number -2.5 lies halfway between -3 and -2 . A vertical number line, such as a thermometer, works the same way, with positive numbers going up.

Questions about integers and rational numbers on the number line

What is an integer?

An integer is a whole number or the opposite of a whole number, like -5 , 0 , or 12 . Integers have no fraction or decimal part.

What is the opposite of a number?

The opposite of a number is the number the same distance from 0 on the other side. The opposite of 7 is -7 and the opposite of -7 is 7 .

What does zero mean in real-world situations?

Zero marks the starting point, such as sea level, 0 degrees, or a balance of $\$0$. It means no gain and no loss.

How do you plot a negative fraction on a number line?

Split each unit into equal parts and count left from 0 . The point for $-1/2$ is halfway between 0 and -1 .

What is a rational number?

A rational number can be written as a fraction of two integers, with a nonzero denominator. Examples are $\frac{3}{4}$, -2.5, and 6.