

*Parent Packet*

HAUPPAUGE MATH

DEPARTMENT

CCLS

Grade 6

MODULE 3

<http://www.hauppauge.k12.ny.us/math>

## Grade 6 • Module 3

### Rational Numbers

#### OVERVIEW

In this module's final topic, the number line model is extended to two-dimensions, as students use the coordinate plane to model and solve real-world problems involving rational numbers.

Topic A focuses on the development of the number line in the opposite direction (to the left or below zero). Students use positive integers to locate negative integers, understanding that a number and its opposite will be on opposite sides of zero and that both lie the same distance from zero. Students represent the opposite of a positive number as a negative number and vice-versa. Students realize that zero is its own opposite and that the opposite of the opposite of a number is actually the number itself (6.NS.C.6a). They use positive and negative numbers to represent real-world quantities such as  $-50$  to represent a \$50 debt or  $50$  to represent a \$50 deposit into a savings account (6.NS.C.5). Topic A concludes with students furthering their understanding of signed numbers to include the rational numbers. Students recognize that finding the opposite of any rational number is the same as finding an integer's opposite (6.NS.C.6c) and that two rational numbers that lie on the same side of zero will have the same sign, while those that lie on opposites sides of zero will have opposite signs.

In Topic B, students apply their understanding of a rational number's position on the number line (6.NS.C.6c) to order rational numbers. Students understand that when using a conventional horizontal number line, the numbers increase as you move along the line to the right and decrease as you move to the left. They recognize that if  $a$  and  $b$  are rational numbers and  $a < b$ , then it must be true that  $-a > -b$ . Students compare rational numbers using inequality symbols and words to state the relationship between two or more rational numbers. They describe the relationship between rational numbers in real-world situations and with respect to numbers' positions on the number line (6.NS.C.7a, 6.NS.C.7b). For instance, students explain that  $-10^{\circ}F$  is warmer than  $-11^{\circ}F$  because  $-10$  is to the right (or above)  $-11$  on a number line and write  $-10^{\circ}F > -11^{\circ}F$ . Students use the concept of absolute value and its notation to show a number's distance from zero on the number line and recognize that opposite numbers have the same absolute value (6.NS.C.7c). They apply their understanding of order and absolute value to determine that, for instance, a checking account balance that is less than  $-25$  dollars represents a debt of more than \$25 (6.NS.C.7d).

In Topic C, students extend their understanding of the ordering of rational numbers in one dimension (on a number line) to the two-dimensional space of the coordinate plane. They construct the plane's vertical and horizontal axes, discovering the relationship between the four quadrants and the signs of the coordinates of points that lie in each quadrant (6.NS.C.6b, 6.NS.C.6c). Students apply the concept of absolute value to find the distance between points located on vertical or horizontal lines and solve real-world problems related to distance, segments, and shapes (6.NS.C.8).

The 25-day module consists of 19 lessons; 6 days are reserved for administering the Mid- and End-of-Module Assessments, returning assessments, and remediating or providing further applications of the concepts. The Mid-Module Assessment follows Topic B, and the End-of-Module Assessment follows Topic C.

# Grade 6 Module 3

## **Rational Numbers**

Students are familiar with the number line and determining the location of positive fractions, decimals, and whole numbers from previous grades. Students extend the number line (both horizontally and vertically) in Module 3 to include the opposites of whole numbers. The number line serves as a model to relate integers and other rational numbers to statements of order in real-world contexts. In this module's final topic, the number line model is extended to two-dimensions, as students use the coordinate plane to model and solve real-world problems involving rational numbers.

## Terminology

### New or Recently Introduced Terms

- **Absolute Value** (The absolute value of a number is the distance between the number and zero on the number line. For example,  $|3| = 3$ ,  $|-4| = 4$ , etc.)
- **Charge** (As in a *charge* to an account, or a fee *charged*, which is the amount of money a person must pay.)
- **Credit** (A decrease in an expense, as in money *credited* to an account. For instance, when a deposit is made into a checking account, the money is *credited* to the account. A credit is the opposite of a debit.)
- **Debit** (An increase in an expense or money paid out of an account. For instance, using a *debit* card to make a purchase will result in an expense, and money will be deducted from the related bank account.)
- **Deposit** (The act of putting money into a bank account.)
- **Elevation** (The height of a person, place, or thing above a certain reference level.)
- **Integers** (The numbers ..., -3, -2, -1, 0, 1, 2, 3, ... on the number line.)
- **Magnitude** (The absolute value of a measurement, given the measurement of a positive or negative quantity.)
- **Negative Number** (A number less than zero.)
- **Opposite** (In a position on the other side, as the negative numbers are the opposite direction from zero as the positive numbers.)
- **Positive Number** (A number greater than zero.)
- **Quadrants** (The four sections of the coordinate plane formed by the intersection of the axes.)
- **Rational Number** (A fraction or the opposite of a fraction on the number line.)
- **Withdraw** (The act of taking money out of a bank account.)

### Familiar Terms and Symbols<sup>2</sup>

- Coordinate Pair
- Coordinate Plane
- Fraction
- Line of Symmetry
- Ordered Pair
- Origin
- Quadrant
- Symmetry
- Whole Numbers
- $x$ -Axis
- $x$ -Coordinate
- $y$ -Axis
- $y$ -Coordinate

## **Technology Resources**

[www.k-5mathteachingresources.com](http://www.k-5mathteachingresources.com) -This site provides an extensive collection of free resources, math games, and hands-on math activities aligned with the Common Core State Standards for Mathematics.

[www.parccgames.com](http://www.parccgames.com) – fun games to help kids master the common core standards.

<http://www.mathplayground.com> –common core educational math games and videos.

[www.learnzillion.com](http://www.learnzillion.com) – math video tutorials.

[www.ixl.com](http://www.ixl.com) – practice common core interactive math skills practice.

[www.mathnook.com](http://www.mathnook.com) –common core interactive math skill practice/ games, worksheets and tutorials.

[www.adaptedmind.com](http://www.adaptedmind.com) – common core interactive practice, video lessons and worksheets

[www.brainpop.com](http://www.brainpop.com) – animated tutorials of curriculum content that engages students. Can use a limited free version or buy a subscription.