Unit 4: Rational Numbers

Content Area: **Mathematics**
Course(s):
Time Period: **Marking Period 1**
Length: **11 days**
Status: **Published**

Brief Summary of Unit

This unit introduces students to positive and negative numbers. Students will learn to locate and compare rational numbers on a number line, understand absolute values, and graph points in all four quadrants of the coordinate plane. Real-world applications, such as temperature changes and financial transactions, will contextualize these concepts, ensuring practical understanding and relevance.

Revision Date: June 2024

Standards

1	Make sense of problems and persevere in solving them
2	Reason abstractly and quantitatively
3	Construct viable arguments and critique the reasoning of others
4	Model with mathematics
9.4.8.CT	Critical Thinking and Problem-solving
L.KL.6.2	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
5	Use appropriate tools strategically
6	Attend to precision
7	Look for and make use of structure
8	Look for and express regularity in repeated reasoning
L.VI.6.4	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
6.NS.C	Apply and extend previous understandings of numbers to the system of rational numbers
6.NS.C.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
6.NS.C.6	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
6.NS.C.6.a	Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.

6.NS.C.6.b	Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
6.NS.C.6.c	Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
6.NS.C.7	Understand ordering and absolute value of rational numbers.
6.NS.C.7.a	Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
9.4.8.IML	Information and Media Literacy
6.NS.C.7.b	Write, interpret, and explain statements of order for rational numbers in real-world contexts.
6.NS.C.7.c	Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.
6.NS.C.7.d	Distinguish comparisons of absolute value from statements about order.
6.NS.C.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
9.4.8.TL	Technology Literacy
ESS2.D	Weather and Climate

Essential Questions

- How can we graph points in all four quadrants of the coordinate plane, and why is this useful in solving problems?
- How can we represent and compare positive and negative numbers on a number line?
- How do we use absolute value to describe the magnitude of a number regardless of its sign?
- In what ways do positive and negative numbers help us describe real-world situations?
- What does it mean for two numbers to be opposites, and how can we identify them?

Enduring Understandings

- Positive and negative numbers, including zero, are used together to describe quantities with opposite directions or values
- The absolute value of a number represents its distance from zero on the number line, regardless of its direction.
- The relative positions of integers on the number line indicate their values and helps you determine how to write an inequality statement.
- The significance of the signs of coordinates determines their position on the coordinate plane.

Students Will Know

- Absolute value is a number's distance from zero and uses the | | symbol.

- How to compare and order rational numbers using < , > or =.
- How to follow directions on a coordinate plane to arrive at a specific point.
- How to graph and order rational numbers.

Students Will Be Skilled At

- Compare rational numbers using the < or > symbol.
- Identifying and plotting opposites of rational numbers on a number line.
- Locating and plotting rational numbers on a number line.
- Using absolute value to describe real world situations (for example: an account balance of −30 dollars, describes the debt |−30| = $30 in debt.)
- Using positive and negative numbers to describe real world situations (for example: an account balance less than −30 dollars represents a debt greater than 30 dollars)
- Using the coordinate plane to plot rational numbers in all four quadrants of a coordinate plane and following directions on a coordinate plane to arrive at a specific point.
- Using the number line to order and compare rational numbers.

Evidence/Performance Tasks

Assessments

- Formative: Daily assessments using examples from class notes, iReady MyPath, Big Ideas Math problems, teacher check-ins and NJSLA test bank problems
- Summative: Teacher-created assessments, NJSLA test bank problems, Big Ideas Math unit assessments
- Benchmark: iReady diagnostic assessments
- Alternative Assessments: Student-centered activities such as scavenger hunts, various projects involving real world applications, and adaptive learning tasks in iReady, Khan Academy, and Big Ideas Math

Learning Plan

Day 1: Introduction to Positive and Negative Numbers

- Define integers, understand their significance, and identify positive and negative numbers.

Day 2: Opposites

- Recognize opposite numbers

Day 3: Absolute Value

- Define Absolute Value and symbol for absolute value. Find distances on a number line between 2 numbers with the same sign as well as different signs.

Day 4: Review and Quiz

- Quiz is on identifying positive and negative numbers, opposites and absolute value.

Day 5-6: Comparing and Ordering Integers

- Objective: Compare and order integers using inequality symbols and absolute value.

Day 7-8: Inequality Statements and Order

- Objective: Interpret inequality statements and explain order of rational numbers.

Day 9-10 Graphing in the Coordinate Plane

- Objective: Understand the coordinate plane and graph points in all four quadrants.
- Find distances between two points.

Day 11: Review and Quiz

- Quiz is on comparing and ordering integers, rational numbers and graphing in the coordinate plane.

Total Number of Days: 11

Materials

Core Instructional Materials: Core Book List including Big Ideas Math Modeling Real Life Online Textbook, Big Ideas Student Journal Workbook

Supplemental Instructional Materials: Khan Academy, iReady, IXL (for intervention)

Suggested Strategies for Modifications

Suggested Strategies for Modifications for Grade 6