Unit 2: Rational Numbers
6th Grade Mathematics

16 Class Meetings

Revised January 2024

Essential Questions

- How do the intervals on a number line affect the value of the numbers?
- How does the number line help determine the magnitude of the number?
- When is a coordinate system used in real life?

Enduring Understandings with Unit Goals

EU1: The number line can be extended to the left or downward to include negative values Integers and other rational numbers can be used to represent and model real-world values, including situations with negatives.

- Use positive and negative numbers to represent real-world contexts, including money, temperature, and elevation
- Define and determine opposites
- Find, position, and compare rational numbers on horizontal and vertical number lines.

EU 2: Absolute value can be used to determine a number's distance from zero.

- Define and determine absolute value
- Write and interpret inequalities involving absolute value
- Use absolute value to model magnitude and distance in real world situations

EU 3: When two perpendicular number lines intersect, they create a four-quadrant coordinate plane. The coordinate plane can be used to describe location in two dimensions, defined by an ordered pair.

- Understand structure of the coordinate plane
- Reflect points across axes
- Calculate vertical and horizontal distances on a coordinate plane

Standards

Common Core State Standards:

- **6.NS.C.5:** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values
- **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.
- **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.A:** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
- **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.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.8**: Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane.

ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.
Competency 2: Speak to diverse audiences in an accountable manner.
Competency 3: Develop the behaviors needed to interact and contribute with others on a team.
Competency 4: Analyze and solve problems independently and collaboratively.
Competency 5: Be responsible, creative, and empathetic members of the community.

Unit Content Overview

1. **Positive and Negative Numbers**
   - Extend the number line
   - Use positive and negative numbers to describe real-world contexts
   - Define opposites
   - Find and position integers and rational numbers on horizontal and vertical number lines
   - Vocabulary-positive number, negative number, opposites, credit, debit, charge, integer, deposit, withdrawal, elevation

2. **Order and Absolute Value**
   - Compare and order integers and rational numbers
   - Write and interpret inequalities to compare rational numbers
   - Define absolute value
   - Use absolute value to model magnitude and distance
   - Vocabulary-greater than, less than, inequality, absolute value, equivalent

4. **Coordinate Plane**
   - Understand structure of coordinate plane
   - Use ordered pairs to name location on coordinate plane
   - Reflect points across axes
   - Use absolute value to calculate vertical and horizontal distance between points
   - Vocabulary-vertical, horizontal, opposite, coordinate plane, quadrant, reflection, ordered pair, origin

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Interdisciplinary Connection:

- Language Arts – Reading strategies for solving Word Problems; vocabulary
- Science –
  - Unit 1: Earth & the Universe
  - Unit 2: Water Cycle & Weather Patterns
  - Unit 3: Inside the Earth
  - Unit 5: Ecosystems & Human Impact

Daily Learning Objectives with *TWPS*

Students will be able to…

- Create horizontal and vertical number lines using proper intervals to include positive and negative numbers.
  - *TWPS: Would you rather (Jelly beans) have 364 jelly beans and give 188 to friends or have 281 jellybeans and give 137 to friends?*
- Represent real world situations using positive and negative numbers
  - *TWPS: Would you rather (money) a stack of 14 pennies, 7 nickels, 2 dimes and 1 quarter or a stack of 2 pennies, 4 nickels, 2 dimes and 2 quarters?*
- Generate opposites on a number line
  - *TWPS: Would you rather (apples) have 38 baskets of 12 apples or 40 baskets of 10 apples?*
- Compare and order integers and rational numbers by plotting them on a number line using appropriate intervals (Thermometers)**
  - *TWPS: Which of the three statements below is a lie? Explain how you made your choice. 2 Truths and a Lie, pg 28*
  - *TWPS: Would you rather (Option A or B) a) 23 hundreds, 48 tens and 9 ones or b) 26 hundreds, 17 tens and 22 ones?*
- Construct and interpret inequalities to compare rational numbers
  - *TWPS: Which of the three statements below is a lie? Explain how you made your choice. 2 Truths and a Lie, pg 26*
- Distinguish absolute value of a number and use it to find distance on a number line.
  - *TWPS: Which of the three statements below is a lie? Explain how you made your choice. 2 Truths and a Lie, pg 27*
- Construct a coordinate plane with appropriate components
  - *TWPS: Which of the three statements below is a lie? Explain how you made your choice. 2 Truths and a Lie, pg 29*
- Demonstrate and describe the locations on the coordinate plane using ordered pairs
  - *TWPS: Which of the three statements below is a lie? Explain how you made your choice. 2 Truths and a Lie, pg 30*
- Evaluate and explain the impact of reflections on the signs of ordered pairs
  - *TWPS: Which one Doesn't Belong? (coins) 5 nickels, 5 dimes, 1 quarter or 25 pennies?*

- Calculate the vertical and horizontal distances on a coordinate plane using absolute value
  - *TWPS: Which of the three statements below is a lie? Explain how you made your choice. 2 Truths and a Lie, pg. 31*

Instructional Strategies/Differentiated Instruction

- Whole group instruction
- Guided notes
- Accountable Talk
- TWPS
- Student-led instruction/discussions
- Independent problem-solving
- Collaborative problem-solving
- Graphic Organizer
- Cross-curricular problem solving (independent and collaborative)
- Homework
- Word walls with visuals
- Small group instruction
- Manipulatives
- Interactive Notebook
- Highlighted directions

EL DIFFERENTIATED INSTRUCTION:

- Word Walls with visuals
- TWPS (Think, Write, Pair, Share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit Modeling
- Key Vocabulary
- Graphic Organizers
- Strategic Grouping
- Non-verbal Assessments
- Modified classwork and homework

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Assessments

FORMATIVE ASSESSMENTS:

- Warm-ups
- TWPS
- Whiteboards
- Mid-class check-ins (Fist of 5; Thumbs up/mid/down)
- Exit Slips
- Accountable Talk Discussions
- Student-led instruction
- Classwork
- Homework

SUMMATIVE ASSESSMENTS:

- Edulastic Quiz - EU 1
- Edulastic Quiz – EU 2
- Performance Task- "Water Crisis in Haiti"- Isaac Rubric (#4- Problem Solving)
- Edulastic Unit 1 Summative Assessment
- FIAB Rational Numbers ll

Unit Task

Unit Task Name: "Water Crisis in Haiti"

Description: In this task, students will use their knowledge of the integers (EU1), coordinate plane and graphing to complete a plan for visiting effected cities on a coordinate map of Haiti, given specific instructions throughout the activity. They will plot and label the cities on the coordinate plane (EU3), identify coordinates, reflect points over the x and y axes, and calculate the vertical and horizontal distances on a coordinate plane using absolute value (EU 2).

Evaluation: Unit 1 Summative Assessment and Problem Solving Rubric

Unit Resources

- Edulastic
- Engageny
- Math In Focus
- Math Antics
- State Common Core Standards Transition Tasks
- Match Fishtank
- Worksheets
- Individual White boards
- Interactive notebook
- Laptops
- SBAC Prep Online
- 2 Truths & One Lie

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