Unit 2: Integers and Rational Numbers

Content Area: **Mathematics**
Course(s):
Time Period: **October**
Length: **3-4 weeks**
Status: **Published**

Essential Questions

- How can I use a number line to identify, compare, and order rational numbers?
- How can I use the absolute value of a number to describe its distance from zero on a number line and to find the distance between points on a coordinate plane?

Enduring Understandings

- Integers are the counting numbers, their opposites, and 0. Integers can be compared, ordered, and used to describe real-world contexts.
- Each rational number can be associated with a unique point on the number line. A number to the right of another on the number line is greater.
- The absolute value of a number can be describes as the numbers distance from 0 on the number line. Absolute value can be interpreted as the magnitude of a positive or negative quantity in a real-world situation.
- A coordinated plane is formed by a horizontal number line, the x-axis, and a vertical number line, the y-axis, that intersects at a point called the origin. An ordered pair (x,y) locates a point on the coordinate plane.
- The distance between two points on the coordinate place with the name first coordinate or the same second coordinate can be found by adding or subtracting the absolute values of the coordinates that differ.
- The coordinate of the vertices of a polygon on the coordinate place can be used to find the lengths of the sides of the polygon and its perimeter.

Critical Knowledge and Skills

Vocabulary

Integers, Opposites, Rational Number, Absolute Value, Coordinate Plane, Ordered Pair, Origin, Quadrant, X- and Y- axes

Learning Objectives

- 2-1: Understand Integers
    - Identify opposites of integers
    - Compare and order integers
    - Use integers to represent real-world quantities and explain the meaning of 0 in each context
- 2-2: Represent Rational Numbers on the Number Line

- Plot rational numbers on a number line
- Compare and order rational numbers
- Use rational numbers to represent real world quantities

- 2-3: Absolute Value of Rational Numbers
  - Use absolute value to represent a numbers distance from 0.
  - Interpret absolute value in real-world situations.
- 2-4: Represent Rational Numbers on the Coordinate Plane
  - Identify and graph points with rational coordinates on the coordinate plane.
  - Reflect points with rational coordinates across both axes.
- 2-5: Find Distances on the Coordinate Plane
  - Use absolute value to find the distance between two points that lie on the same horizontal or vertical line on a coordinate plane.
  - Solve real-world mathematical problems involving distances on the coordinate plane.
- 2-6: Represent Polygons on the Coordinate Plane
  - Find side lengths of polygons on the coordinate plane
  - Find the perimeter of polygons on the coordinate plane

Resources

- Lesson Resources
  - Student Edition
  - Additional Practice Workbook
  - Teaching Resources
    - Reteach to Build Understanding, Additional Vocabulary Support, Build Mathematical Literacy, Enrichment
  - Digital Lesson Courseware
    - Today’s Challenge, Visual Learning Animation Plus, Key Concepts, Additional Examples, 3-Act Mathematical Modeling, Online Practice powered by MathXL for School, Virtual Nerd Video Tutorials, Animated Glossary, Digital Math Tools, Online Math Games
- Topic Resources

- Student's Edition
    - Review What You Know, Build Literacy in Mathematics, Mid-Topic Checkpoint and Performance Task, Topic Review, Fluency Practice Activity, STEM Project
- Digital Topic Support for Students
    - Math Practice Animations, STEM Project, 3-Act Mathematical Modeling Lesson

Standards for Mathematical Content

MA.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.
MA.6.NS.C.6a	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.
MA.6.NS.C.6b	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.
MA.6.NS.C.6c	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.
MA.6.NS.C.7a	Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
MA.6.NS.C.7b	Write, interpret, and explain statements of order for rational numbers in real-world contexts.
MA.6.NS.C.7c	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.
MA.6.NS.C.7d	Distinguish comparisons of absolute value from statements about order.
MA.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.
MA.6.G.A.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

Standards for Mathematical Practice

CCSS.Math.Practice.MP1	Make sense of problems and persevere in solving them.
CCSS.Math.Practice.MP2	Reason abstractly and quantitatively.
CCSS.Math.Practice.MP3	Construct viable arguments and critique the reasoning of others.

CCSS.Math.Practice.MP4	Model with mathematics.
CCSS.Math.Practice.MP5	Use appropriate tools strategically.
CCSS.Math.Practice.MP6	Attend to precision.
CCSS.Math.Practice.MP7	Look for and make use of structure.
CCSS.Math.Practice.MP8	Look for and express regularity in repeated reasoning.

INTERDISCIPLINARY CONNECTIONS