**Unit 7: Rational Explorations: Numbers and Their Operations**

*Sixth Grade Mathematics*

**Unit Essential Question:** How are integers and absolute value used in real world situations?

**Common Core Georgia Performance Standards:**

**MGSE6.NS.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, debits/credits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

**MGSE6.NS.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.

1. 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., , and that 0 is its own opposite.

**b.** Understand signs of number 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.

**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.

**MGSE6.NS.7** Understand ordering and absolute value of rational numbers.

**a.** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.

**b.** Write, interpret, and explain statements of order for rational numbers in real-world contexts.

**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.

**d.** Distinguish comparisons of absolute value from statements about order.

**MGSE6.NS.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.

**MGSE6.G.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 those techniques in the context of solving real-world mathematical problems.

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| **Acquisition Lesson 1**  **Concept:** Introducing Integers  **Standard(s):** GSE6.NS.5, GSE6.NS.6  **Lesson EQs:**   * When are negative numbers used and why are they important? * Why is it useful for me to know the absolute value of a number? * How do I use positive and negative numbers in everyday life? * What are opposites, and how are opposites shown on a number line? | **Acquisition Lesson 2**  **Concept:** Compare & Order Rational Numbers  **Standards(s):** GSE6.NS.7  **Lesson EQs:**   * Where do I place positive and negative rational numbers on the number line? * How do I use positive and negative numbers to represent quantities in real-world contexts? * How do statements of inequality help me place numbers on a number line? | **Acquisition Lesson 3**  **Concept:** Coordinate Plane  **Standard(s):** GSE6.NS**.**6b & 6c, GSE6.NS.8, GSE6.G.3  **Lesson EQs:**   * Why is graphing on the coordinate plane helpful? * How can I use coordinates to find the distances between points? * How can I use absolute value to find the lengths of the sides of polygons on the coordinate plane? |