



Marietta City Schools

District Unit Planner

Everything on the unit planner must be included on the unit curriculum approval statement.

Grade 6 Advanced Studies

Unit title	<i>Unit 2: Rational Explorations: Numbers and Their Opposites (GaDOE Unit 7)</i>	MYP year	<i>1</i>	Unit duration (hrs)	<i>20 Hours</i>
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Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

GSE Standards

Standards

Apply and extend previous understandings of numbers to the system of rational numbers.

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.

MGSE6.NS.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.

MGSE6.NS.6b 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.

MGSE6.NS.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.

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

MGSE6.NS.7a Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.

MGSE6.NS.7b Write, interpret, and explain statements of order for rational numbers in real world contexts.

MGSE6.NS.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.

MGSE6.NS.7d 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.

Solve real-world and mathematical problems involving area, surface area, and volume.

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.

Concepts/Skills to be Mastered by Students

- Understand that positive and negative numbers are used together to describe quantities having opposite directions or values.
- 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.
- 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.
- 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.
- 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.
- Understand ordering and absolute value of rational numbers.
- Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
- Write, interpret, and explain statements of order for rational numbers in real-world contexts.
- 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.
- Distinguish comparisons of absolute value from statements about order.
- Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane.

Vocabulary

- Absolute value: The distance between a number and zero on the number line. The symbol for absolute value is shown in the equation $|-8| = 8$.
- Cartesian Coordinate Plane: A plane containing two perpendicular axes (x and y) intersecting at a point called origin $(0, 0)$.
- Coordinates: An ordered pair, (x, y) , that locates a point in a plane.
- Distance: amount of separation between 2 points.
- Inequality: Any mathematical sentence that contains the symbols $>$ (greater than), $<$ (less than), \leq (less than or equal to), or \geq (greater than or equal to).
- Integers: The set of whole numbers and their opposites $\{\dots - 3, -2, -1, 0, 1, 2, 3, \dots\}$
- Magnitude: Greatness in size or amount
- Negative numbers: The set of numbers with a value less than zero

- Opposite number: Two different numbers that have the same absolute value. Example: 4 and -4 are opposite numbers because both have an absolute value of 4. They are the same distance from zero, in opposite directions.
- Ordered Pair: A pair of numbers, (x, y) , that indicate the position of a point on the Cartesian coordinate Plane.
- Origin: The point of intersection of the vertical and horizontal axes of a Cartesian coordinate plane. The coordinates of the origin are $(0, 0)$.
- Polygon: A closed figure formed by three or more line segments.
- Positive number: The set of numbers whose value is greater than zero.
- Quadrant: One of the four regions on a Coordinate plane formed by the intersection of the x-axis and the y-axis.
- Rational number: The set of numbers that can be written in the form $\frac{a}{b}$ where a and b are integers and $b \neq 0$.
- Sign: a symbol that indicates whether a number is positive or negative. Example: in -4 , the $(-)$ sign shows this number is read “negative four”.
- x-axis: The horizontal number line on the Cartesian coordinate plane.
- x-coordinate: The first number of in ordered pair; the position of a point relative to the vertical axis
- y-axis: The vertical number line on the Cartesian coordinate plane
- y-coordinate: The second number in an ordered pair; the position of a point relative to the horizontal axis

Key concept	Related concept(s)	Global context
Relationships The connections and associations between properties, objects, people and ideas.	Equivalence, Generalization	Identities and Relationships
Statement of inquiry		
Modeling using a logical process helps us to understand the world		
Inquiry questions		
<p>Factual— Why is it useful for me to know the absolute value of a number? Where do I place positive and negative rational numbers on the number line? What are opposites, and how are opposites shown on a number line? How do statements of inequality help me place numbers on a number line? How can I use coordinates to find the distances between points? How can I use number lines 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?</p> <p>Conceptual— How do I use positive and negative numbers to represent quantities in real-world contexts?</p> <p>Debatable-When are negative numbers used and why are they important? When is graphing on the coordinate plane helpful? How do I use positive and negative numbers in everyday life?</p>		
MYP Objectives	Assessment Tasks	

	Relationship between summative assessment task(s) and statement of inquiry:	List of common formative and summative assessments.
	<p>Students will understand, interpret, write, and explain the relationship between numbers: positive, negative, and rational numbers using a number line, coordinate plane, and absolute value.</p> <div data-bbox="461 304 831 762" style="border: 1px solid black; padding: 5px;"> <p>What specific MYP objectives will be addressed during this unit?</p> <p>Criterion C: Communicating</p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p> </div>	<p>Formative Assessment(s): Unit 2 CFA - NS.5, NS6ac, NS.7ab, NS7cd</p> <div data-bbox="1581 352 1957 464" style="border: 1px solid black; height: 70px; width: 168px;"></div> <p>Summative Assessment(s): Unit 2 Summative Assessment- All Standards Google Maps Latin America Tour</p>

Approaches to learning (ATL)

Category: Social
Cluster: Collaboration Skills
Skill Indicator: Give and receive meaningful feedback.

Category: Communication
Cluster: Communication
Skill Indicator: Organize and depict information logically

Learning Experiences

Add additional rows below as needed.

Objective or Content	Learning Experiences	Personalized Learning and Differentiation
<p>MGSE6.NS.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.</p> <p>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.</p>	<p>Terryville Task Students will understand and interpret the absolute value of a rational number, and solve real world mathematical problems by graphing points on a coordinate plane. In this task students will have a list of objectives presented to them that they need to solve.</p>	<p>Students will be supported through intentional planning and implementation using the 5 Practices. Teachers will support through assessing and advancing questions and aggressive monitoring of students through the task. Students will have access to number lines, xy pegboards, and various manipulatives to support their work with absolute value.</p>
<p>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.</p>	<p>Human Number Line In this task students will use a human number line to understand number lines that can be extended to the left (or below zero) to include values that are negative or less than zero. Students will understand that numbers increase from left to right (or from bottom to top) and decrease from right to left (or top to bottom) on a number line. Students will also define integers as a set of numbers that includes whole numbers, their opposites (negative values of whole numbers), and zero.</p>	<p>Teachers should group students strategically and provide scaffolds through intentional questioning. Students can be provided with an open number line, fraction tiles, and a completed numberline for additional support.</p>

Content Resources

Savvas- Topic 2
 Illustrative Mathematics
 NCTM Illuminations
 GaDOE Frameworks

