## Grade 6 Math Unit 7

Canterbury Public Schools	
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Subject	Math
Grade Level	6
Unit Title	Rational Numbers
Unit Goals	Negative Numbers and Absolute Value         Comprehend the words "positive" and "negative" and the symbol "-" (negative symbol)         Interpret positive and negative numbers that represent temperature or elevation and understand the convention of what "below zero" means         Recognize that the number line can be extended to represent negative numbers         Inequalities         coordinate verbal, algebraic, and number line representations of inequalities         Graph inequalities on a number line         Write an inequality to represent a situation, at least, at most, up to, more than, less than,         Interpret phrases:         The Coordinate Plane         Generalize about the signs of coordinates that represent locations in each quadrant of the coordinate plane         Plot a point given its coordinates or identify the coordinates of a given point on the coordinate plane         Recognize the axes of the coordinate plane can be extended to represent negative numbers.         Common Factors and Common Multiples         Explain what a common factor is         Explain what the greatest common factor of two whole numbers
Pacing (# of weeks)	6 to 8 weeks

Standards	
	• <b>6.NS.C.5</b> – Understand that positive and negative numbers are used together to describe quantities having opposite directions or values.
	<ul> <li>6.NS.C.6 – Understand a rational number as a point on the number line; understand ordering and absolute value of rational numbers.</li> </ul>
	• 6.NS.C.7 – Understand ordering and absolute value of rational numbers.
	<ul> <li>6.NS.C.8 – Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane.</li> </ul>
	<ul> <li>6.NS.B.4 – Find the greatest common factor and least common multiple of whole numbers</li> </ul>
Content/Conceptual Knowledge (know)	Knowledge (Students will know…)
	• The meaning of rational numbers, including negative numbers and zero
	How to find and interpret absolute value
	How to compare and order rational numbers
	<ul> <li>How to find and use greatest common factor (GCF) and least common multiple (LCM)</li> </ul>
	<ul> <li>How to plot and interpret points on the coordinate plane in all four</li> </ul>
Skills (be able to do)	Represent rational numbers and absolute value on a number line
	Use number sense and symbols to compare rational numbers
	Apply rational numbers to real-life scenarios
	<ul> <li>Identify and apply GCF and LCM in solving problems</li> </ul>
	<ul> <li>Plot and interpret points on the coordinate plane</li> </ul>
	<ul> <li>Solve contextual problems using coordinate graphs and rational number operations</li> </ul>

Essential Questions	<ul> <li>Essential Questions (To provoke deep thinking and inquiry):</li> <li>What does it mean for a number to be negative?</li> <li>How can we use absolute value to describe real-world situations?</li> <li>How do we compare and order numbers that have opposite signs?</li> <li>Why is it helpful to graph numbers and points on a coordinate plane?</li> <li>When and why do we use greatest common factors and least common multiples?</li> </ul>
Enduring Understandings	<ul> <li>Enduring Understandings (Big ideas students should retain):</li> <li>Rational numbers include both positive and negative numbers and can represent real-world quantities and relationships.</li> <li>The number line can extend in both directions to show negative values and their distance from zero.</li> <li>Absolute value represents distance, not direction.</li> <li>Coordinate planes help us describe and analyze relationships between numbers visually.</li> <li>GCF and LCM are tools that help solve problems involving groups, patterns, and repeated quantities.</li> </ul>
Vocabulary	Positive number, negative number, temperature, degrees Celcius, elevation, sea level, opposite, rational number location, sign, inequality, least to greatest, positive change, negative change, absolute value, solution to an inequality, receptive, quadrant, common factor, greatest common factor, least common multiple
Common Learning Experience	Learning Activities (Common Learning Experiences from IM, adapted into a teacher-friendly plan) Week 1: Introducing Rational Numbers and the Number Line

<ul> <li>Use vertical and horizontal number lines to represent positive and negative numbers in context (temperature, elevation, money).</li> <li>Explore zero as the midpoint and reference on the number line.</li> <li>Interactive activity: "Walk the Line" – Students physically represent numbers on a tape number line in the classroom.</li> <li>Partner work: Labeling rational numbers on blank number lines.</li> </ul>
Week 2: Absolute Value and Opposites
• Number line matching game: Pair values with their absolute values.
<ul> <li>Word problems involving temperature, debt, and elevation using absolute value.</li> </ul>
<ul> <li>Discuss and write journal entries: "What is absolute value and why do we need it?"</li> </ul>
<ul> <li>Practice comparing rational numbers using inequality symbols and reasoning.</li> </ul>
Week 3: Rational Numbers in the Real World
<ul> <li>Real-world scenarios comparing rational numbers: Banking, sports scores, submarine depth.</li> </ul>
<ul> <li>Small group task: Create their own rational number scenario and explain it using comparison symbols and absolute value.</li> </ul>
Graphic organizer: Comparing rational numbers chart.
Week 4: Coordinate Plane in All Four Quadrants
Guided exploration of coordinate planes and quadrants.
<ul> <li>Task: Plotting points based on real-life contexts (e.g., treasure maps, school layouts).</li> </ul>
Game: "Coordinate Battleship" in pairs or small groups.
<ul> <li>Interactive graphing tool practice (e.g., Desmos or paper-based plotting).</li> </ul>

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	Week 5: Applying GCF and LCM
	Factor trees and area models to explore prime factorization.
	GCF scavenger hunt: Match problems with their GCF.
	• Context problems using GCF (e.g., arranging chairs, grouping students).
	<ul> <li>LCM in action: Scheduling events or calculating when different timers will go off together.</li> </ul>
	Week 6: Putting It All Together
	• Performance Task 1: Create a real-world rational number scenario and represent it on a number line with explanations.
	<ul> <li>Performance Task 2: Design a coordinate plane map using all four quadrants and answer questions about distances and locations.</li> </ul>
	<ul> <li>Performance Task 3: Solve multi-step GCF/LCM problems and justify reasoning in writing.</li> </ul>
	<ul> <li>Reflection Journals: "What do I now know about rational numbers that I didn't before?"</li> </ul>
Assessments	Performance Tasks (Summative/Authentic Assessments):
	1. <b>Rational Number Challenge</b> Students create a real-world situation involving both positive and negative rational numbers (e.g., temperature, elevation, money), graph values on a number line and/or coordinate plane, and explain relationships using absolute value and comparison symbols.
	2. <b>Coordinate Plane Project</b> Students design a simple map (school campus, game board, etc.) using all four quadrants. They must label and interpret points, describe direction and distance, and solve word problems involving movement on the grid.
	Common Factor/Multiple Puzzle Create or solve multi-step word problems using GCF and LCM, such as event

	planning or packaging scenarios. Students explain why each value is useful and how it applies.
	Other Evidence (Formative Assessments, Checks for Understanding, Self-Assessment):
	Warm-up tasks with number line placement and number comparisons
	<ul> <li>Journal prompts: "What is absolute value and why do we need it?"</li> </ul>
	<ul> <li>Quick check activities: "Order these from least to greatest," "Plot these points," etc.</li> </ul>
	Partner or group problem-solving with immediate feedback
	Math Talks or exit slips using rational number and coordinate plane vocab
	Quiz on rational numbers and coordinate plane vocabulary, ordering, and comparing
	Self-assessment rubric for graphing accuracy and communication of reasoning Mid and end of unit tests
Resources	Bingo chips, colored pencils, graphing technology, masters, rulers, snap cubes, sticky notes, tracing paper
Strategies	Turn and talk, math chats, notice and wonder, Three Reads, Think Pair Share,