

ACCENTUATE THE NEGATIVE Integers and Rational Numbers

<p>Instructional Time and Investigations</p>	<p>22 days</p>	<ul style="list-style-type: none"> • Inv. 1: Extending the Number System (4 Problems) • Inv. 2: Adding and Subtracting Rational Numbers (4 Problems) • Inv. 3: Multiplying and Dividing Rational Numbers (4 Problems) • Inv. 4: Properties of Operations (3 Problems)
<p>Goals</p>	<p>Rational Numbers: Develop an understanding that rational numbers consist of positive numbers, negative numbers, and zero.</p> <ul style="list-style-type: none"> • Rational numbers can be compared, ordered, and located on a number line. They can also be used to indicate a distance or difference between points on a number line. Number lines are useful models for solving problems with rational numbers. 	<p>Operations with Rational Numbers: Develop understanding of operations with rational numbers and their properties.</p> <ul style="list-style-type: none"> • Models facilitate understanding the meaning of addition, subtraction, multiplication, and division of positive and negative numbers, and improve understanding of the standard algorithms for these operations. This also helps to identify which operation is helpful to solve a problem. • Mathematical sentences, with or without variables, can model real-world problems. Sometimes rewriting a problem using a different operation can be helpful in finding the solution. • Properties of operations (such as Order of Operations, Commutative Property, and Distributive Property) extend to all rational numbers, and understanding these properties is helpful in solving problems.
<p>Common Core Standards</p>	<p>Common Core Standards for Mathematical Practice</p> <p>MP.1: Make sense of problems and persevere in solving them.</p> <p>MP.2: Reason abstractly and quantitatively.</p> <p>MP.3: Construct viable arguments and critique the reasoning of others.</p> <p>MP.4: Model with mathematics.</p> <p>MP.5: Use appropriate tools strategically.</p> <p>MP.6: Attend to precision.</p> <p>MP.7: Look for and make use of structure.</p> <p>MP.8: Look for and express regularity in repeated reasoning.</p>	<p>Common Core Content Standards</p> <p>7.NS.A.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>7.NS.A.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>7.NS.A.3: Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p>7.EE.B.3: Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p> <p>7.EE.B.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</p> <p>Also 7.NS.A.1a–d, 7.NS.A.2a–d, 7.EE.B.4b</p>

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Content Connections to Other Units

Goals of the Unit	Prior Work	Future Work
<p>Rational Numbers: Develop an understanding that rational numbers consist of positive numbers, negative numbers, and zero.</p>	<ul style="list-style-type: none"> • Developing understanding of whole numbers and rational numbers (<i>Prime Time; Comparing Bits and Pieces; Let's Be Rational; Decimal Ops</i>) • Using models to develop understanding of mathematical concepts (<i>Comparing Bits and Pieces; Let's Be Rational; Decimal Ops; Covering and Surrounding</i>) • Using a coordinate grid with positive coordinates (<i>Data About Us; Variables and Patterns</i>) • Using a number line to develop equivalence and operations of fractions and decimals (<i>Comparing Bits and Pieces; Let's Be Rational; Decimal Ops</i>) 	<ul style="list-style-type: none"> • Interpreting and applying positive and negative slopes of lines and positive and negative coefficients in equations (<i>Moving Straight Ahead; Thinking With Mathematical Models; Frogs, Fleas, and Painted Cubes; Say It With Symbols; It's In the System; Function Junction</i>) • Developing understanding of square roots and irrational numbers (<i>Looking for Pythagoras</i>) • Understanding relationships between positive and negative coefficients or values for variables (<i>Moving Straight Ahead; Thinking With Mathematical Models; Frogs, Fleas, and Painted Cubes; Say It With Symbols; It's In the System; Function Junction</i>) • Using positive and negative integers to communicate directions in two dimensions (<i>Stretching and Shrinking; Butterflies, Pinwheels, and Wallpaper</i>) • Graphing equations and functions on coordinate grids (<i>Comparing and Scaling; Moving Straight Ahead; Thinking With Mathematical Models; Growing, Growing, Growing; Frogs, Fleas, and Painted Cubes; Say It With Symbols; It's In the System; Function Junction; Stretching and Shrinking, Butterflies, Pinwheels, and Wallpaper</i>) • Locating square roots on the number line (<i>Looking for Pythagoras</i>)
<p>Operations with Rational Numbers: Develop understanding of operations with rational numbers and their properties.</p>	<ul style="list-style-type: none"> • Understanding and applying arithmetic operations with rational numbers (<i>Comparing Bits and Pieces; Let's Be Rational; Decimal Ops</i>) • Developing understanding of the Commutative Property and Distributive Property using whole numbers and rational numbers (<i>Prime Time; Let's Be Rational; Decimal Ops; Variables and Patterns</i>) • Using the Order of Operations to solve problems in a context (<i>Prime Time; Covering and Surrounding; Variables and Patterns</i>) 	<ul style="list-style-type: none"> • Evaluating algebraic expressions involving positive and negative coefficients or values for variables (<i>Moving Straight Ahead; Data Distributions; Thinking With Mathematical Models; Frogs, Fleas, and Painted Cubes; Say It With Symbols, It's In the System; Function Junction</i>) • Interpreting isometries in the plane given in symbolic form (<i>Butterflies, Pinwheels, and Wallpaper</i>) • Using the properties and Order of Operations to write equivalent expressions and solve equations (<i>Comparing and Scaling; Moving Straight Ahead; Thinking With Mathematical Models; Growing, Growing, Growing; Frogs, Fleas, and Painted Cubes; Say It With Symbols; It's In the System; Function Junction</i>)