

Unit B - Operations on Signed Numbers

Overview

Students will apply negative numbers to explain real world events. Students integrate problem solving and skill building that extends from positive numbers in Unit A to properties of integers and rational numbers in Unit B. Students develop a portfolio and track stocks to see the impact of positive and negative growth on assets. Students will examine short versus long term asset choices to determine which are best for their college and retirement savings.

21st Century Capacities: Decision Making

Stage 1 - Desired Results

<p>ESTABLISHED GOALS/ STANDARDS</p> <p>MP1 Make sense of problems and persevere in solving them</p> <p>MP3 Construct viable arguments and critique the reasoning of others</p> <p>MP4 Model with Mathematics</p> <p>MP5 Use appropriate tools strategically</p> <p>CC.7.NS.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>CC.7.NS.1a Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</p> <p>CC.7.NS.1b Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center; background-color: #D3D3D3;">Transfer:</td> </tr> <tr> <td colspan="2" style="padding: 5px;"><i>Students will be able to independently use their learning in new situations to...</i></td> </tr> <tr> <td colspan="2" style="padding: 5px;"> <ol style="list-style-type: none"> 1. Demonstrate fluency with math facts, computation and concepts. 2. Justify reasoning using clear and appropriate mathematical language. (Decision Making) </td> </tr> <tr> <td colspan="2" style="text-align: center; background-color: #D3D3D3;">Meaning:</td> </tr> <tr> <td style="width: 50%; padding: 5px;"> <p>UNDERSTANDINGS: <i>Students will understand that:</i></p> <ol style="list-style-type: none"> 1. Manipulating equations/expressions or objects can create order and establish relationships. 2. Mathematicians use appropriate tools to make reaching solutions more efficient, accessible and accurate. </td> <td style="width: 50%; padding: 5px;"> <p>ESSENTIAL QUESTIONS: <i>Students will explore & address these recurring questions:</i></p> <ol style="list-style-type: none"> A. How can I use symbols to communicate? B. How can I explain this mathematically? C. How can change be described? </td> </tr> <tr> <td colspan="2" style="text-align: center; background-color: #D3D3D3;">Acquisition:</td> </tr> <tr> <td style="width: 50%; padding: 5px;"> <p><i>Students will know...</i></p> <ol style="list-style-type: none"> 1. The relative magnitude of signed integers 2. The meaning of absolute value </td> <td style="width: 50%; padding: 5px;"> <p><i>Students will be skilled at...</i></p> <ol style="list-style-type: none"> 1. Computing the mean of a given set of integers 2. Comparing and ordering integers </td> </tr> </table>	Transfer:		<i>Students will be able to independently use their learning in new situations to...</i>		<ol style="list-style-type: none"> 1. Demonstrate fluency with math facts, computation and concepts. 2. Justify reasoning using clear and appropriate mathematical language. (Decision Making) 		Meaning:		<p>UNDERSTANDINGS: <i>Students will understand that:</i></p> <ol style="list-style-type: none"> 1. Manipulating equations/expressions or objects can create order and establish relationships. 2. Mathematicians use appropriate tools to make reaching solutions more efficient, accessible and accurate. 	<p>ESSENTIAL QUESTIONS: <i>Students will explore & address these recurring questions:</i></p> <ol style="list-style-type: none"> A. How can I use symbols to communicate? B. How can I explain this mathematically? C. How can change be described? 	Acquisition:		<p><i>Students will know...</i></p> <ol style="list-style-type: none"> 1. The relative magnitude of signed integers 2. The meaning of absolute value 	<p><i>Students will be skilled at...</i></p> <ol style="list-style-type: none"> 1. Computing the mean of a given set of integers 2. Comparing and ordering integers
Transfer:															
<i>Students will be able to independently use their learning in new situations to...</i>															
<ol style="list-style-type: none"> 1. Demonstrate fluency with math facts, computation and concepts. 2. Justify reasoning using clear and appropriate mathematical language. (Decision Making) 															
Meaning:															
<p>UNDERSTANDINGS: <i>Students will understand that:</i></p> <ol style="list-style-type: none"> 1. Manipulating equations/expressions or objects can create order and establish relationships. 2. Mathematicians use appropriate tools to make reaching solutions more efficient, accessible and accurate. 	<p>ESSENTIAL QUESTIONS: <i>Students will explore & address these recurring questions:</i></p> <ol style="list-style-type: none"> A. How can I use symbols to communicate? B. How can I explain this mathematically? C. How can change be described? 														
Acquisition:															
<p><i>Students will know...</i></p> <ol style="list-style-type: none"> 1. The relative magnitude of signed integers 2. The meaning of absolute value 	<p><i>Students will be skilled at...</i></p> <ol style="list-style-type: none"> 1. Computing the mean of a given set of integers 2. Comparing and ordering integers 														

Integrated Algebra & Geometry Curriculum

<p>rational numbers by describing real-world contexts.</p> <p>CC.7.NS.1c Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p> <p>CC.7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.</p> <p>CC.7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers:</p> <p>CC.7.NS.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>CC.7.NS.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</p> <p>CC.7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.</p> <p>CC.7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)</p> <p>CC.7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</p>	<p>3. Vocabulary: integers, opposites, absolute value, distributive property, commutative property</p>	<p>3. Simplifying opposites and absolute values</p> <p>4. Adding/subtracting integers and rational numbers</p> <p>5. Evaluating expressions with integers and rational numbers</p> <p>6. Multiplying and Dividing Integers and rational numbers</p> <p>7. Working with exponents on signed numbers</p> <p>8. Simplifying expressions with like terms</p> <p>9. Applying the distributive property to word problems and area models.</p>
--	--	---