Grade 6 Mathematics – Unit 1: Positive and Negative Numbers

Phoenixville Area School District

Stage 1 Desired Results		
PA Core Standards:	***Transfer***	
M06.A-N.3.1 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values and locations on the number line and coordinate plane.	TRANSFER GOALS *Students will be able to independently use their learning to…* • *Number Sense:* Develop a sound foundation to demonstrate the value of numbers by describing their various representations, relationships, and patterns. • *Mathematical Vocabulary:* Interpret mathematical vocabulary and apply proper terminology to engage in meaningful oral and written expression that communicates mathematical thinking, problem-solving methods, and rationale.	
	Meaning	
M06.A-N.3.2 Understand ordering and absolute value of rational numbers.	UNDERSTANDINGS *Students will understand that…* • Algebraic expressions, equations, inequalities, and functions (linear, absolute value) are used to model relationships between quantities in real-world situations. • Patterns and functions can be generalized and represented using; verbal models, tables, equations, and graphs.	ESSENTIAL QUESTIONS *Students will keep considering...* • How do I create a representation that describes the problem situation? How do I know if I got it right? Is one representation more appropriate than another? • What is the pattern here? How do I represent it? How do I use it?
PSSA Assessment Anchors:	***Knowledge and Skills Acquisition***	
M06.A-N.3 Apply and extend previous understandings of numbers to the system of rational numbers.	KNOWLEDGE *Students will know…* • Quantities in real-world contexts using positive and negative numbers • Meaning of 0 in real-world situations • Opposite numbers and that they are also known as additive inverses • Coordinates of rational numbers on a number line as well as a coordinate plane • Absolute value is a number's distance from zero on the number line • Absolute value can be used to determine the distance between coordinates on a coordinate plane	SKILLS *Students will be skilled at…* • Differentiating between positive and negative numbers when given the temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge in a real-world problem. • Determining the opposite of a number and recognizing that the opposite of the opposite of a number is the number itself when explaining the concept in written form. • Plotting pairs of integers and other rational numbers on a coordinate plane. • Explaining statements of order for rational numbers in real-world contexts. Example: Write –

| | VOCABULARY | 3°C > –7°C to express the fact that –3°C is warmer than –7°C. |
| | | Interpreting the absolute value of a rational number as a magnitude for a positive or negative quantity in a real-world situation. Example: For an account balance of –30 dollars, write \|–30\| = 30 to describe the size of the debt in dollars, and recognize that an account balance less than –30 dollars represent a debt greater than 30 dollars. Solving real-world and mathematical problems by plotting points in all four quadrants of the coordinate plane. |

The vocabulary list (middle column):

VOCABULARY
- Absolute Value
- Additive Inverse
- Axis
- Counting Number
- Degree (Temperature)
- Inequality
- Magnitude
- Negative Number
- Opposite Number
- Positive Number
- Rational Number

Stage 2 – Evidence

Code A/M/T	Evaluative Criteria	Assessment Evidence	
A/M/T Acquisition Meaning Making Transfer	*What criteria will be used in each assessment to evaluate attainment of the desired results?*	PERFORMANCE TASK(S) *Students will demonstrate understanding (meaning making and transfer) through complex performance by...* **Polygons in a Coordinate Plane** The student will locate and plot specific coordinates and identify the polygons in the coordinate plane. ***Goal:*** Your task is to draw polygons in a coordinate plane. ***Role/Audience:*** You are a video game designer and could be promoted to work on a virtual Battleship game. ***Situation/Product:*** You will locate the coordinates, plot the vertices and connect them to form polygons. ***Success Criteria:*** Your graph must include the polygons shaded a specific color and a label.	Differentiation Considerations: Find the area of each polygon.
A/M/T Acquisition Meaning Making Transfer	*What criteria will be used in each assessment to evaluate attainment of the*	OTHER EVIDENCE **[Unit Test]** [Multiple Choice] [True/False] [Matching] - Define absolute value and use a number line to show what it means.	Differentiation Considerations: Questions testing similar skills are modified. Work needs to be shown. Advanced students can write high level sentences utilizing math vocabulary and include examples when responding to the written responses.

	desired results?	• How do the quadrants on a coordinate plane vary? • In what ways are negative numbers used in a real-world situation? Give two examples.	Partial credit is provided to students that demonstrate steps even if their answer is not correct. The assessment can be read to students. Encouragement is given to highlight certain instructions.