

Grade 6 Mathematics – Unit 4: Introduction to Algebra

Phoenixville Area School District

Stage 1 Desired Results

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<p>PA Core Standards: M06.B-E.1.1 Identify, write, and evaluate numerical and algebraic expressions.</p> <p>M06.B-E.2.1 Create, solve, and interpret one- variable equations or inequalities in real-world and mathematical problems.</p> <p>M06.B-E.3.1 Use variables to represent two quantities in a real-world problem that change in relationship to one another.</p> <p>PSSA Assessment Anchors: M06.B-E.1 Apply and extend previous understandings of arithmetic to numerical and algebraic expressions.</p> <p>M06.B-E.2 Interpret and solve one-variable equations and inequalities.</p>	Transfer	
	<p>TRANSFER GOALS <i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> • <i>Number Sense:</i> Develop a sound foundation to demonstrate the value of numbers by describing their various representations, relationships, and patterns. • <i>Fluency:</i> Demonstrate automatic recall of addition, subtraction, multiplication, and division of rational numbers. • <i>Reasoning:</i> Demonstrate mathematical resilience and conceptual understanding through the use of vocabulary, written expression, graphical representation, and alternate strategies. 	
	Meaning	
	<p>UNDERSTANDINGS <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Variables represent the unknown so that mathematicians can generalize a pattern rather than being limited to looking at specific values. • Algebraic rules and properties determine how expressions are simplified and how equations are solved. 	<p>ESSENTIAL QUESTIONS <i>Students will keep considering...</i></p> <ul style="list-style-type: none"> • What is the nature of the relationship? How do I represent it? • What does this quantity/number/ expression/value mean? What are the ways to represent it? Is there a best way?
	Knowledge and Skills Acquisition	
	<p>KNOWLEDGE <i>Students will know...</i></p> <ul style="list-style-type: none"> • Numerical expressions involving whole-number exponents • Algebraic expressions from verbal descriptions • Mathematical terms (e.g., sum, term, product, factor, quotient, coefficient, quantity) • Expressions at specific values of their variable • Properties of operations to generate equivalent expressions • Substitution as a method to solve equations and inequalities • Algebraic expressions written to represent real-world or mathematical problems 	<p>SKILLS <i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> • Writing and evaluating numerical expressions involving whole-number exponents when simplifying an expression. • Converting verbal and/or written descriptions into algebraic expressions. • Recognizing mathematical terms when writing an algebraic expression. • Evaluating expressions when utilizing formulas in real-world problems. • Applying the order of operations to generate equivalent expressions when simplifying an expression.

<p>M06.B-E.3 Represent and analyze quantitative relationships between dependent and independent variables.</p>	<ul style="list-style-type: none"> • The form $x + p = q$ and $px = q$ for cases in which p, q, and x are all non-negative rational numbers • Inequalities in the form of $x > c$ or $x < c$ • Dependent and independent variables in an equation and found in a graph and table <p>VOCABULARY</p> <ul style="list-style-type: none"> • Algebraic Expression • Coefficient • Exponent • Expression • Inequality • Variable 	<ul style="list-style-type: none"> • Substituting given numbers to solve an equation or inequality. • Utilizing the form $x + p = q$ and $px = q$ when solving equations in real-world problems. • Using the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem and/or represent solutions of such inequalities on number lines. • Expressing the relationship between the dependent and independent variables when writing an equation. • Analyzing the relationship between the dependent and independent variables using graphs and tables and/or relate these to an equation.
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Stage 2 – Evidence

Code A/M/T	Evaluative Criteria	Assessment Evidence	
<p>A/M/T</p> <p>Acquisition</p> <p>Meaning Making</p> <p>Transfer</p>	<p><i>What criteria will be used in each assessment to evaluate attainment of the desired results?</i></p>	<p>PERFORMANCE TASK(S)</p> <p><i>Students will demonstrate understanding (meaning making and transfer) through complex performance by...</i></p> <p>Boxes</p> <p>The task challenges the student to know the meaning of equality. Equations and inequalities can be established as a strategy to solve the problems.</p> <ul style="list-style-type: none"> • Goal: Your task is to determine which box is the heaviest. • Role/Audience: You are given a pictorial representation as your occupation as a mover. • Situation/Product: You will use reasoning to determine which box is the heaviest. • Success Criteria: The product must include a written explanation to support the reasoning. 	<p>Differentiation Considerations:</p> <p>Partial credit is provided to students that demonstrate steps even if their answer is not correct.</p> <p>The assessment can be read to students. Encouragement is given to highlight certain instructions.</p>
<p>A/M/T</p> <p>Acquisition</p>	<p><i>What criteria will be used in each assessment</i></p>	<p>OTHER EVIDENCE</p> <p>[Unit Test]</p> <ul style="list-style-type: none"> • [Multiple Choice] • [True/False] 	<p>Differentiation Considerations:</p> <p>Questions testing similar skills are modified. Work needs to be shown.</p>

Meaning Making Transfer	<i>to evaluate attainment of the desired results?</i>	<ul style="list-style-type: none">• [Matching]• What is the difference between an equation and an inequality?• How do you know which is the independent variable and the dependent variable when graphing?	Advanced students can write high level sentences utilizing math vocabulary and include examples when responding to the written responses. 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.
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