

Pre-Algebra – Unit 3: Expressions and Equations

Phoenixville Area School District

Stage 1 Desired Results					
<p>PA Core Standards: M07.B-E.1.1 Use properties of operations to generate equivalent expressions. M07.B-E.2.1 Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers. M07.B-E.2.2 Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems.</p> <p>PSSA Assessment Anchors: M07.B-E.1 Represent expressions in equivalent forms. M07.B-E.2 Solve real-world and mathematical problems using</p>	<i>Transfer</i>				
	<p>TRANSFER GOALS <i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> • Number Sense: Develop a sound foundation to demonstrate the value of numbers by describing their various representations, relationships, and patterns. • Problem-Solving: Persistently apply various problem-solving strategies and organized approaches to accurately understand and solve problems and provide evidence to support response. • Reasoning: Demonstrate mathematical resilience and conceptual understanding through the use of vocabulary, written expression, graphical representation, and alternate strategies. 				
	<i>Meaning</i>				
	<table border="1"> <thead> <tr> <th style="text-align: center;">UNDERSTANDINGS <i>Students will understand that...</i></th> <th style="text-align: center;">ESSENTIAL QUESTIONS <i>Students will keep considering...</i></th> </tr> </thead> <tbody> <tr> <td> <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. • Algebraic expressions, equations, inequalities, and functions (linear, absolute value, quadratic, polynomial, exponential, and logarithmic) 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. </td> <td> <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? • How do I create an equation/ 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? </td> </tr> </tbody> </table>	UNDERSTANDINGS <i>Students will understand that...</i>	ESSENTIAL QUESTIONS <i>Students will keep considering...</i>	<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. • Algebraic expressions, equations, inequalities, and functions (linear, absolute value, quadratic, polynomial, exponential, and logarithmic) 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. 	<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? • How do I create an equation/ 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?
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numerical and algebraic expressions, equations, and inequalities. M07.B-E.2.3 Determine the reasonableness of the answer(s) in problem solving situations.	Knowledge and Skills Acquisition	
	KNOWLEDGE <i>Students will know...</i> <ul style="list-style-type: none"> • Simplifying Expressions • The form $px + q = r$ and $p(x + q) = r$ for cases in which p, q, and x are rational numbers. • Factoring Expressions • Equations that require one or more steps to solve. • The form $px + q > r$ or $px + q < r$ where p, q, and r are rational numbers. • Solving Inequalities VOCABULARY <ul style="list-style-type: none"> • Expressions • Equations • Solution • Factoring • Distribute • Combine Like Terms 	SKILLS <i>Students will be skilled at...</i> <ul style="list-style-type: none"> • Applying properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients in order to simplify an expression. • Solving word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$ in order to solve real-world problems. • Solving and graphing inequalities of the form $px + q > r$ or $px + q < r$ in order to solve real world problems. • Determining the reasonableness of answer(s) or interpret the solution(s) in the context of a real-world problem.

Stage 2 – Evidence

Code A/M/T	Evaluative Criteria	Assessment Evidence	
A/M/T Acquisition Meaning Making Transfer	<i>What criteria will be used in each assessment to evaluate attainment of the desired results?</i>	PERFORMANCE TASK(S) <i>Students will demonstrate understanding (meaning making and transfer) through complex performance by...</i> Jane's TV With the application of the Pythagorean Theorem, you will become the expert on finding the right sized television for anyone's entertainment center. <ul style="list-style-type: none"> • Goal: Your task is to make recommendations for the space in which a specific television will fit and the proper sized set for a given area. 	Differentiation Considerations:

		<ul style="list-style-type: none"> • Role/Audience: You are a friend of Jane's. • Situation/Product: You will use the Pythagorean Theorem to figure out the dimensions of a television. • Success Criteria: Your recommendation must include evidence of the calculations and illustration(s). 	
<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>OTHER EVIDENCE</p> <p>Unit Test</p> <ul style="list-style-type: none"> • Multiple Choice • True/False • Matching • Describe the process followed when simplifying an algebraic expression. • How is a coefficient different from an exponent? 	<p>Differentiation Considerations:</p>