

Pre-Algebra – Unit 8: Equations and Functions

Phoenixville Area School District

Stage 1 Desired Results			
<p>PA Core Standards: M08.B-E.2.1 Analyze and describe linear relationships between two variables, using slope. M08.B-E.3.1 Write, solve, graph, and interpret linear equations in one or two variables, using various methods. M08.B-F.1.1 Define, evaluate, and compare functions displayed algebraically, graphically, or numerically in tables or by verbal descriptions.</p> <p>PSSA Assessment Anchors: M08.B-E.2 Understand the connections between proportional relationships, lines, and linear equations. M08.B-E.3 Analyze and solve linear equations and pairs of simultaneous linear equations. M08.B-F.1 Analyze and interpret functions.</p>	<p><i>Transfer</i></p>		
	<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. 		
	<p><i>Meaning</i></p>		
	<table border="1"> <tr> <td> <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. • 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> <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? • 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> </table>	<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. • 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. 	<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? • 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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Knowledge and Skills Acquisition	
<p>KNOWLEDGE <i>Students will know...</i></p> <ul style="list-style-type: none"> • Equations with Variables on Both Side • Multi-Step Equations & Inequalities • Relations and Functions • Graphing Equations • Equations and Intercepts • Constant Rate of Change & Slope • Slope-Intercept Form <p>VOCABULARY</p> <ul style="list-style-type: none"> • No Solution • All Real numbers • Relations • Functions • Domain • Range • Input • Output • Intercepts • Slope 	<p>SKILLS <i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> • Deriving the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b. • Writing and identifying linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). • Solve linear equations that have rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. • Determining whether a relation is a function. • Interpreting the equation $y = mx + b$ as defining a linear function whose graph is a straight line. • Constructing a function to model a linear relationship between two quantities. • Determining the rate of change and initial value of a linear function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. • Interpreting the rate of change and initial value of a linear function in terms of the

		<p>situation it models and in terms of its graph or a table of values.</p> <ul style="list-style-type: none"> • Describing qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). • Sketching or determining a graph that exhibits the qualitative features of a function that has been described verbally.
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Stage 2 – Evidence

Code A/M/T	Evaluative Criteria	Assessment Evidence	
<p style="background-color: yellow;">A/M/T</p> <p style="background-color: yellow;">Acquisition</p> <p style="background-color: yellow;">Meaning Making</p> <p style="background-color: yellow;">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>Party</p> <p>Use models to solve problems involving quantity and change. Formulate an equation to represent given situations.</p> <ul style="list-style-type: none"> • Goal: Your task is to use an algebraic formula to calculate the expected cost for a party. • Role/Audience: You are planning festivities for 100 people as part of the committee and need to share the projected costs. • Situation/Product: You will give a formula and graph that provides the cost in terms of people. • Success Criteria: Your presentation will include how much a party for 100 people will cost and an explanation of how this was calculated. 	<p>Differentiation Considerations:</p>
<p style="background-color: yellow;">A/M/T</p> <p style="background-color: yellow;">Acquisition</p> <p style="background-color: yellow;">Meaning Making</p> <p style="background-color: yellow;">Transfer</p>	<p><i>What criteria will be used in each assessment to evaluate attainment of the</i></p>	<p>OTHER EVIDENCE</p> <p>Unit Test</p> <ul style="list-style-type: none"> • Multiple Choice • True/False • Matching 	<p>Differentiation Considerations:</p>

	<i>desired results?</i>	<ul style="list-style-type: none">• Describe the strategy to use to solve when variables appear on both sides of an equation.• How is an equation properly graphed?• Which strategy is favorable to graph an equation – using a function table or one set of coordinates and the slope? Why?	
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