

# Algebra II – Unit 3: Quadratic Functions

## Phoenixville Area School District

Stage 1 Desired Results		
<b>PA Core Standards:</b> CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.  CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.  CC.2.1.HS.F.7 Apply concepts of complex numbers in polynomial identities and quadratic equations to solve problems.  CC.2.2.HS.D.4 Understand the relationship between zeros and factors of polynomials to make generalizations about functions and their graphs.  CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.	<b>Transfer</b>	
	<b>TRANSFER GOALS</b> <i>Students will be able to independently use their learning to...</i> <ul style="list-style-type: none"> <li>• <i>Fluency:</i> Demonstrate automatic recall of addition, subtraction, multiplication, and division of rational numbers.</li> <li>• <i>Problem-Solving:</i> Persistently apply various problem-solving strategies and organized approaches to accurately understand and solve problems and provide evidence to support response.</li> <li>• <i>Reasoning:</i> Demonstrate mathematical resilience and conceptual understanding through the use of vocabulary, written expression, graphical representation, and alternate strategies.</li> </ul>	
	<b>Meaning</b>	
	<b>UNDERSTANDINGS</b> <i>Students will understand that...</i> <ul style="list-style-type: none"> <li>• Algebraic rules and properties determine how expressions are simplified and how equations are solved.</li> <li>• 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.</li> <li>• Patterns and functions can be generalized and represented using, verbal models, tables, equations, and graphs.</li> </ul>	<b>ESSENTIAL QUESTIONS</b> <i>Students will keep considering...</i> <ul style="list-style-type: none"> <li>• What is the question asking? How do I get there?</li> <li>• What does this quantity/number/ expression/value mean? What are the ways to represent it? Is there a best way?</li> <li>• 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?</li> </ul>

<b>Knowledge and Skills Acquisition</b>		
<p>CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations.</p> <p>CC.2.2.HS.C.4 Interpret the effects transformations have on functions.</p> <p>CC.2.2.HS.C.5 Construct and compare linear and quadratic, models to solve problems.</p> <p>CC.2.2.HS.C.6 Interpret functions in terms of the situations they model.</p>	<p><b>KNOWLEDGE</b>  <i>Students will know...</i></p> <ul style="list-style-type: none"> <li>• How to graph and analyze quadratic functions and write its equation in different forms</li> <li>• How to solve quadratic equations by factoring, taking a square root, completing the square, and quadratic formula</li> <li>• How to simplify, multiply, and divide radicals</li> <li>• How to add subtract, subtract, multiply, and divide complex numbers</li> </ul> <p><b>VOCABULARY</b></p> <ul style="list-style-type: none"> <li>• Quadratic</li> <li>• Vertex Form/Standard Form/Factored Form</li> <li>• Factor/Zero/Root</li> <li>• Difference of Squares/Perfect Square</li> <li>• Radical/Square Root</li> <li>• Complex Number</li> <li>• Completing the Square</li> <li>• Quadratic Formula</li> </ul>	<p><b>SKILLS</b>  <i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>• Writing, graphing, and analyzing quadratic functions through matching and open response questions</li> <li>• Solving quadratic equations by factoring, taking a square root, completing the square, or using the quadratic formula through open response questions</li> <li>• Simplifying, adding, subtracting, multiplying, and dividing complex numbers through open response questions</li> <li>• Solving and analyzing the solutions to real-world application open response and constructed response problems</li> </ul>

## 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><b>[Performance Assessment Title]</b> [Performance Assessment Description]</p> <ul style="list-style-type: none"> <li>• <i>Goal:</i> Your task is to...</li> <li>• <i>Role/Audience:</i> You are a...</li> <li>• <i>Situation/Product:</i> You will...</li> <li>• <i>Success Criteria:</i> Your [product] must include...</li> </ul>	<p>Differentiation Considerations:</p>
<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><b>[Unit Test]</b></p> <ul style="list-style-type: none"> <li>• [Multiple Choice]</li> <li>• [True/False]</li> <li>• [Matching]</li> <li>• [Constructed Response Prompts:]</li> </ul>	<p>Differentiation Considerations:</p>