

UNIT OF STUDY

Title: "Quadratic Quandary" (Unit 16) Subject/Course: Integrated Algebra B Part 2 Length: 2½ weeks	
Topic: Solve & Simplify Radicals/ Solve & Graph Quadratics Grade: 9 Designer: Foresee/Phipps	
UNIT GOALS AND EXPECTATIONS	
IMPORTANT CONCEPTS/UNDERSTANDINGS: <ul style="list-style-type: none"> • A square root of a negative number does not exist, it is imaginary. • When you add an even root (such as a square root) to solve a problem you must also include a +/- sign. • Simplifying is NOT solving! • You must have the same number of primes as the root of the expression in order to bring it out from under the radical • If a number is already on the outside of a radical leave it alone until there is something else on the outside to combine it with. • A fraction inside a radical must be simplified. • There cannot be a radical in the denominator of a fraction. • A max/min is NOT a number, it is a coordinate point! • The graph of a quadratic equation is a parabola. • Roots, zeros, x-intercepts, and solutions of the graph of a quadratic equation are the same thing. • Quadratic Equations can have zero, one, or two real solutions. • To solve quadratic equations the equation must be transformed so that one side of the equation is zero. 	ESSENTIAL QUESTIONS: <ul style="list-style-type: none"> • What is the difference between a square root of a negative number, a square root of a positive number, and a negative square root of both? • What will the answer to a simplification problem look like and how is it different from a problem that a person is required to solve? • When will a quadratic equation produce one solution versus two solutions? • When must a +/- sign be added to a problem/solution? • In what order must operations be applied to solve a problem dealing with exponents or radicals? • When will I know to stop simplifying a radical expression? • What is the difference between a max versus a min on a parabola? • When will a parabola have one versus two roots? • How is a quadratic equation set equal to zero when originally it is not?
STUDENT LEARNING EXPECTATIONS: <ul style="list-style-type: none"> • LA.1.AI.1 Evaluate <i>algebraic expressions</i>, including radicals, by applying the order of operations • LA.1.AI.8 Simplify <i>radical expressions</i> such as $\frac{3}{\sqrt{7}}$ • LA.1.AI.9 Add, subtract, and multiply simple radical expressions like $3\sqrt{20} + 7\sqrt{5}$ and $4\sqrt{5} * 2\sqrt{3}$ 	<ul style="list-style-type: none"> • NLF.3.AI.3 Solve <i>quadratic equations</i> using the appropriate methods with and without technology <ul style="list-style-type: none"> ○ <i>factoring</i> ○ <i>quadratic formula</i> with real number solutions • NLF.3.AI.2 Determine <i>minimum, maximum, vertex, and zeros</i>, given the graph
SPECIFIC DECLARATIVE KNOWLEDGE –	SPECIFIC PROCEDURAL KNOWLEDGE –

<p>What I know</p> <p>Vocabulary</p> <ul style="list-style-type: none"> • Radical Expressions • Radical Equations • Associative Property • Commutative Property • Maximum Point • Minimum Point • Negative Square Root • Parabola • Principal • Quadratic Equation • Quadratic Formula • Square Root • Roots/Zeros/X-intercepts/Solutions 	<p>What I need to do</p> <ul style="list-style-type: none"> • Evaluate positive and negative radical expressions. • Solve one and two step radical equations. • Simplify radicals • Simplify radicals multiplied to fractions • Simplify radicals with fractions • Simplify radicals divided by whole numbers. • Simplify radicals with variables. • Find minimum and maximums from quadratic graphs • Graph quadratic equations. • Finding roots from quadratic graphs. • Use quadratic formula to solve quadratic equations. • Split the radical into two parts when there is a fraction inside of the radical, then simplify both parts. • Determine if a solution satisfies the original equation.
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UNIT ASSESSMENTS
(Include tasks related to Dimensions 3 and 4 and Bloom’s Taxonomy)

- 3 Open Response prompts requiring students to solve and graph problems dealing with quadratic equations.
- 1 Open Response prompt requiring students to solve real world situations involving square roots.
- 1 Open Response prompt requiring students to solve numerous problems about quadratics and radical expressions.

<p>Traditional Assessments:</p> <ul style="list-style-type: none"> • Multiple Choice Quizzes over: solving & simplifying radical expressions, and graphing & solving quadratic equations • Vocabulary Test • Warm-Up Quizzes • Unit Test 	<p>Other Evidence of Learning:</p> <ul style="list-style-type: none"> • “Homelearning” • Classwork • Warm-up exercises
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<p>ACTIVITIES AND LEARNING EXPERIENCES</p> <ul style="list-style-type: none"> • Introduce Vocabulary using 4-Step Vocabulary Strategy • Use Mastery Math materials to practice concepts • “Quadratic Exploration” • Quadratic Equation Songs (“Pop Goes the Weasel,” “Row Row Row Your Boat,” “Jingle Bells”) 	<p>Resources</p> <ul style="list-style-type: none"> • Vocabulary List • 4-Step Vocabulary Worksheet • Mastery Math materials • www.mathopenref.com/quadraticexplore.html
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Career Connections

NASA, Scientist, Engineers, Physicist, Tank Operator, Weapons Specialist, Expert Marksman (Rambo wannabe)