


Algebra II Curriculum Bundle #3

Title		Suggested Dates
Quadratics		October 5 – October 23 (14 days)

Big Idea/Enduring Understanding	Guiding Questions
No matter how you choose to solve a quadratic function for real solutions, you are always looking for where the function crosses the x-axis.	<ol style="list-style-type: none"> 1. What does it mean if the parabola does not cross the x-axis? 2. How many ways can you solve a quadratic? 3. How many different terms are used to identify a solution to a quadratic?
The graph of a quadratic function is a parabola. It forms a curve because the slope doesn't stay constant like in a linear function.	<ol style="list-style-type: none"> 1. How does a quadratic function differ from a linear function? 2. What portion of the parabola represents the maximum or minimum and why? 3. What does the standard form of a quadratic function look like? 4. How can models of a quadratic function be used to make predictions in a real world situation? 5. What are some applications of quadratic functions and how can you tell if a quadratic can be used to model a situation?

The resources included here provide teaching examples and/or meaningful learning experiences to address the District Curriculum. In order to address the TEKS to the proper depth and complexity, teachers are encouraged to use resources to the degree that they are congruent with the TEKS and research-based best practices. Teaching using only the suggested resources does not guarantee student mastery of all standards. Teachers must use professional judgment to select among these and/or other resources to teach the District Curriculum.

Knowledge & Skills with Student Expectations	District Specificity/Examples	Suggested Resources (See note above)
PSAT sample problems intended for use as warm-ups starting on Sept 17th can be found in the campus shared folder called "PSAT Math Preparation 2009-10"		
<p>2A.6 Quadratic and Square Root Functions. The student understands that quadratic functions can be represented in different ways and translates among their various representations.</p> <p>2A.6A The student determines the reasonable domain and range values of quadratic functions, as well as interprets and determines the reasonableness of solutions to quadratic equations and inequalities.</p> <p>NOTE: PSAT will be given on the 14th.</p>	<ul style="list-style-type: none"> • Identify domain and range in application problems, especially limitations on domain and range in application problems. For example, lengths, widths and areas can not be negative. • Identify the solutions of a quadratic equation/inequality and determine the reasonableness of a solution in a problem situation using graphs, tables, equations. • Quadratic regressions. 	<p>A&M Curriculum Fall Section 7-5 Quadratic application problems: Day 1</p> <p>PSAT warm-ups from the district</p>

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<p>2A.6 Quadratic and Square Root Functions. The student understands that quadratic functions can be represented in different ways and translates among their various representations.</p> <p>2A.6B The student relates representations of quadratic functions, such as algebraic, tabular, graphical, and verbal descriptions.</p>	<ul style="list-style-type: none"> • Make connections between and among all the listed representations of quadratic functions; ie, identify the characteristics from a table and relate the same to the graph. (with and without calculator) • Determine graph from equation • Write equation given a word problem • Write equation given a chart • Given a chart, use finite differences method and /or systems of equations to write equations. (optional) 	<p>Texas Alg II Holt, Rinehart, & Winston</p> <p>Explore graphs & factors Pg. 332</p>	<p>A&M Curriculum Fall Section 7-5B Quadratic application problems: Day 2</p>
<p>2A.6 Quadratic and Square Root Functions. The student understands that quadratic functions can be represented in different ways and translates among their various representations.</p> <p>2A.6C The student determines a quadratic function from its roots (real and complex) or a graph.</p>	<ul style="list-style-type: none"> • Understand that roots/solutions are associated with the equation and that zeros/x-intercepts are associated with the graph. • Find roots from a table, graph and algebraically. • Use the sum and product of the roots to write the equation. (optional) • Multiply the binomial factors together to write the equation (distribute). • Determine roots given factored form • Determine the equation given a graph and/or roots, vertical scale factor and y-intercept 	<p>Texas Alg II Holt, Rinehart, & Winston</p> <p>Section 5-3 Solving Quadratic Equations by Graphing (use graph & table only) Pg. 333-340</p>	<p>A&M Curriculum Fall Section 6-5 Writing Quadratic Equations</p>

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<p>2A.7 Quadratic and Square Root Functions. The student interprets and describes the effects of changes in the parameters of quadratic functions in applied and mathematical situations.</p> <p>2A.7A The student uses characteristics of the quadratic parent function to sketch the related graphs and connects between the $y = ax^2 + bx + c$ and the $y = a(x - h)^2 + k$ symbolic representations of quadratic functions.</p>	<ul style="list-style-type: none"> • Connect all quadratic graphs to the parent function. • Connect the x-value of the vertex (h) to $-b/2a$. • Recognize that c is the y-intercept. • Use completing the square to transform the standard form ($y = ax^2 + bx + c$) to vertex form ($y = a(x-h)^2+k$). • Square the binomial in $y = a(x-h)^2 + k$ and simplify to find the standard form as shown above. • Connect the x-value of the vertex to h and the y-value of the vertex with k. • Identify the line of symmetry and write its equation. • Use the value of “a” to determine whether the function opens up or down. • Connect the y-value of the vertex as the maximum or minimum value of the function. 	<p>Texas Alg II Holt, Rinehart, & Winston</p> <p>Section 5-2 Properties of Quadratic functions in standard form Pg. 323-330</p> <p>Section 5-4 Completing the Square Pg. 341-348</p> <p>Discovering Advanced Algebra Key Curriculum Press</p> <p>Section 7.2 Equivalent Quadratic Forms Pg. 368-376</p> <p>Section 7.3 Completing the Square Pg. 377-384</p>	<p>TI Website <u>Completing the square</u></p>
<p>2A.7 Quadratic and Square Root Functions. The student interprets and describes the effects of changes in the parameters of quadratic functions in applied and mathematical situations.</p> <p>2A.7B The student uses the parent function to investigate, describe, and predict the effects of changes in a, h, and k on the graphs of $y = a(x - h)^2 + k$ form of a function in applied and purely mathematical situations.</p>	<ul style="list-style-type: none"> • Describe transformations as related to a specific problem situation. • Stretch, shrink, and reflect (a) • Shift left/right (h) • Shift up/down (k) • Investigate the role of ‘b’ as a horizontal stretch and shrink $y = ((x-h)/b)^2 + k$ (OPTIONAL) 	<p>Texas Alg II Holt, Rinehart, & Winston</p> <p>Section 5-1 Using Transformations to graph quadratics Pg. 315-322</p> <p>Discovering Advanced Algebra Key Curriculum Press</p> <p>Section 4.4 Translations & the Quadratic Family Pg. 193-200</p>	