Algebra II Math: Conics and Special Topics

Before You Begin	
● [At-A-Glance Yearly ARRC Outline](#)	● [Numeracy / Fluency Resources with Visuals](#) ([google doc](#)) ● Misconceptions of student work in this unit

Unit 12 Rationale
Mathematical relations in the real-world can be modeled by functions and/or equations. Collecting and graphing data in order to analyze the relationship(s) between and among the quantities involved in the problem facilitates students in forming an analytical understanding of real world problems. Also, patterns generated in real world contexts can be translated into mathematical models, including conic sections and the fine arts. **Students will know...** ● there are physical laws that are modeled by various mathematical functions ● the techniques for collecting unbiased data and making mathematical decisions ● the types of real world problem situations modeled by conic sections, including satellite dishes and concentric circles in the natural world **Students will be able to...** ● identify independent and dependent quantities ● use technology to regress data to the appropriate mathematical model ● identify the appropriate domain and range in the given problem situation After this unit of study, students should be able to clearly explain their answers to the following questions: In what ways can functions model real world applications? In what ways are mathematical patterns and thinking connected to explanations and understanding of the world around us?

Suggested Pacing
Unit 12: 5 Days (HS double block) ● Days 1-2 (HS): write the equation of a parabola using given attributes, including vertex, focus, directrix, axis of symmetry, and direction of opening (**2A.4B**) ● Day 3-4 (HS): show that the equation of a circle with center at the origin and radius r is $x^2 + y^2 = r^2$ and determine the equation for the graph of a circle with radius r and center (h, k), $(x - h)^2 + (y - k)^2 = r^2$ (**G.12E**) ● Days 5 (HS): Assessment

Academic Vocabulary : Interactive FULL glossary		
Glossary and Index of Terms	**Algebra I Vocab Cards**	**Algebra II Vocab Cards**
● parabola ● circle ● quadratic function ● origin	● radius ● center (h, k) ● vertex of a parabola ● focus of a parabola	● directrix ● axis of symmetry ● mathematical model ● regression

Additional Resources

Chapter 14 Modeling with Functions (Student textbook)

Chapter 14 Modeling with Functions
    Lesson 14.3: "It's Time to Focus", p 1101 - 1124
        Parabolas as Conics

Chapter 14 Modeling with Functions
    Lesson 14.4: "But I Regress", p 1125 - 1140
        Regression

Chapter 14 Modeling with Functions
    Lesson 14.5: "Grab Bag", p 1141 - 1152
        Choosing Functions to Model Situations

Chapter 14 Modeling with Functions (Teacher textbook)

Student assignments for chapter 14   Student assignments Teacher's Key for chapter 14
Warm-up problems