Algebra 2: Unit 4 Instructional Focus — Modeling with Functions

Topic	Instructional Foci
Topic 1: The Modeling Cycle	In this unit students synthesize and generalize what they have learned about a variety of function families. They explore the effects of transformations on graphs of diverse functions, in order to abstract the general principle that transformations on a graph always have the same effect regardless of the type of the underlying function. Combinations of functions are used to model real-world events. Students identify appropriate types of functions to model a situation, they adjust parameters to improve the model, and they compare models by analyzing appropriateness of fit and making judgments about the domain over which a model is a good fit. The description of modeling as "the process of choosing and using mathematics and statistics to analyze empirical situations, to understand them better, and to make decisions" (CCSS, 2010) is at the heart of this unit. The narrative discussion and diagram of the modeling cycle should be considered when knowledge of functions, statistics, and geometry is applied in a modeling context. Honors students explore parametric models. ***Concepts:*** • Identify parent functions by their algebraic representations and graphs, and construct geometric and algebraic representations of their transformations. • Analyze the graphs of combinations of functions. • Understand how the modeling cycle can be used to solve real-world problems. • Apply the modeling cycle to model damped oscillation with combined functions. • Apply the modeling cycle to model a minimal time problem. • Apply recursive processes and the modeling cycle to real-world applications. ***Concepts unique to Honors Algebra 2:*** • Apply the modeling cycle to model motion parametrically.