Advanced Math Concepts
2nd Grading Period

Power Objectives:

- **Write and interpret the structure of expressions in equivalent forms to solve problems. (P.O. #2)**
- **Perform arithmetic operations on polynomials, understand the relationship between zeros and factors of polynomials and use polynomials identities to solve polynomials. (P.O. #3)**
- **Create equations that describe numbers or relationships. (P.O. #5)**
- **Understand, represent and solve equations and inequalities graphically. Use this understanding as a process of reasoning and explain the reasoning. (P.O. #6)**
- **Interpret functions that arise in applications in terms of the context and analyze functions using different representations. (P.O. #7)**

Academic Vocabulary:

- quadratic function
- cubic function
- square root function
- identity function
- reciprocal function
- absolute value function
- axis of symmetry
- parabola
- standard form
- vertex form
- quadratic regression
- reasonable domain and range
- factoring
- functions and function notatior
- domain and range
- piecewise functions
- transformations
- composite functions
- math modeling

Functions and Equations

Enduring Understandings:

- Many math applications involve functions and these functions often are composite meaning 2 or more.
- Domain and range are the inputs and outputs, the x and y, the independent and dependent variables of an equation.
- The domain and range of quadratic functions can be relative to a situation.
- Most applications in math are composed of transformations and piecewise functions. This means that the true model of a situation is complex and messy and requires multiple functions to describe its action and movement.

Essential Questions:

- How is any function related to the parent quadratic function?
- How does solving for x in any function compare to solving for x in linear functions?
- Why do we analyze domain and range of functions?
- How can functions help make predictions?
- Why does the degree of an equation reveal the number of solutions to the equation?
- Why do we use piecewise functions and transformation in modeling of real life situations?