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| **Clarity for Learning** | |
| **Standard KY.HS.F.1(Algebra 1)** Understand properties and key features of functions and the different ways functions can be represented.  a. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x.  b. Using appropriate function notation, evaluate functions for inputs in their domains and interpret statements that use function notation in terms of a context.  c. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities and sketch graphs showing key features given a verbal description of the relationship.  d. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.  e. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). | |
| **Concepts (Nouns)**  function  domain  range  input  output  function notation | **Skills (Verbs)**  evaluate  interpret  relate  compare |
| **Learning Progressions**  *Prerequisites:*   * Operations with rational numbers * Working with ordered pairs from a graph or table * Key features of linear functions * Solve linear equations * Write linear equation in the form y = mx + b   *Grade Level Skills:*   * Identify a function from tables, graphs, mappings, and equations. * Evaluate functions and interpret function notation in context. * When a function models a relationship between two quantities use a verbal description and identify key features of the graph. * Determine the domain of a function * Determine if a relation is a function. * Evaluate expressions in function notation. * Compare two functions algebraically, numerically, graphically, verbally.   *Clarifications:*  a. When describing relationships between quantities, the defining characteristic of a function is the input value determines the output value or, equivalently, the output value depends upon the input value. In some situations where two quantities are related, each can be viewed as a function of the other.  c. A function is often described and understood in terms of the output behavior, or over what input values is it increasing, decreasing, or constant. Important questions include, “For what input values is the output value positive, negative, or 0? What happens to the output when the input value gets very large in magnitude?” Graphs become useful representations for understanding and comparing functions because these behaviors are often easy to see in the graphs of functions. Key features include, but are not limited to: intercepts; intervals where the function is increasing, decreasing, or remaining constant; relative maxima and minima; symmetries; end behavior; periodicity.  e. Students compare characteristics from various representations for one type of family of function at a time. For quadratics, students might determine which function has a larger maximum when given two different representations of quadratic functions. | |
| **Learning Intentions (I am learning to...)** | **Success Criteria (I know I’m successful when...)** |
| Understand the properties and key features of functions. | * I can understand that a relation is a function if each element of the domain is assigned to exactly one element in the range. * I can determine a reasonable domain and identify constraints on the domain based on the context of a real-world problem. * I can write and evaluate linear functions using function notation. * I can graph a linear function and relate the domain of a function to its graph. * I can interpret functions represented by graphs, tables, verbal descriptions, and function notation in terms of a context. * I can interpret the key features of the graph of a linear function and use them to write the function that the graph represents. |