ACC 9 - Functions

Content Area: **Mathematics**
Course(s): **Math 7 Accelerated**
Time Period: **June**
Length: **4 weeks**
Status: **Published**

Unit Summary

In this unit, students will be introduced to functions, a standard covered in eighth grade. Students are introduced to the concept of a function that relates inputs and outputs. Students will create basic input/outout tables. Students will identify relationships between input and output. They will identify functions in different forms (tables, equations, graphs). The study of functions can relate to previous units including ratess and constant of proportionality. In sixth grade and during earlier seventh grade units, students studied rate and constant of proportionality in proportional relationships. They developed an understanding of how one quantity changes in relationship to another. Students will draw on that knowledge as they investigate how quantities are related in tables, equations, and graphs. Students will make connections between stories and graphs by modeling situations like distance or speed over time.

Standards

MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.8.F.A	Define, evaluate, and compare functions.
MA.8.F.A.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
MA.8.F.A.2	Compare properties (e.g. rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
MA.8.F.A.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.
MA.8.F.B	Use functions to model relationships between quantities.
MA.8.F.B.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
MA.8.F.B.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.
TECH.8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
TECH.8.1.8.A.CS1	Understand and use technology systems.

TECH.8.1.8.A.CS2	Select and use applications effectively and productively.
TECH.8.1.8.D.CS2	Demonstrate personal responsibility for lifelong learning.

Student Learning Objectives

- Students will learn to use a function rule to determine the output.

Essential Questions

- What is a function?
- What can be determined about the relationship between the two quantities by analyzing a function?

Enduring Understandings

- Students will understand that a function is the relationship between an input and an output.
- Students will understand that a graph can be identified as a function by its characteristics.

Application

- Students will be able to independently use their learning to define, analyze, and use a function.
- Students will be able to independently use their learning to determine the input and output of a function and identify what these values represent.
- Students will be able to independently use their learning to appropriately utilize mathematical vocabulary such as relation, function, domain, range, input, output, vertical line, positive/negative correlation, rate of change.

Skills

Students will be skilled at:

- Defining a function as each input is assigned exactly one output.
- Determining if a relation is a function.
- Identifying the domain and range of a relation.
- Utilizing the vertical line test to determine if a relation is a function.
- Completing input/output table to represent a relation.
- Evaluating a function.
- Graphing a function.
- Determining and observe the rate of change (y/x) and specific values when given an x and y value.
- Determining when a function is increasing, decreasing - positive/negative correlation.
- Determining rate of change in a function.

- Utilizing a function rule to determine output.