Unit 5 - Intro to Functions

Content Area: **Mathematics**
Course(s): **Algebra 7**
Time Period: **December**
Length: **4 weeks**
Status: **Published**

Transfer

Big Idea: Intro to Functions

Enduring Understandings

Samples

Functions can be represented in a variety of ways, such as graphs, tables, equations, or words. Each representation is particularly useful in certain situations.

New functions can be made from other functions by applying arithmetic operations or by applying one function to the output of another.

Functions are used to analyze change in various contexts and model real-world phenomena.

Essential Questions

Samples

What is the best way to represent and describe functions?

How do I translate between the various algebraic forms of a linear function?

What types of real world situations can be described by linear and non-linear functions?

Critical Knowledge and Skills

Vocabulary

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Continuous Graph, Dependent Variable, Discrete Graph, Domain, Function, Function Notation, Input, Independent Variable, Linear Function, Nonlinear Function, Output, Range, Relation, Vertical Line Test

Learning Objectives

Bloom's Taxonomy

Represent mathematical relationships using graphs and tables (F.IF.4)

Identify and represent patterns that describe linear functions (A.REI.10)

Identify and represent patterns that describe nonlinear functions (A.REI.10)

Graph equations that represent functions (F.IF.5)

To calculate and interpret the average rate of change of a function (F.IF.6)

Write equations that represent functions (N.Q.2)

Determine whether a relation is a function (F.IF.1)

Find domain and range and use function notation (F.IF.1)

Evaluate functions for inputs in their domains using function notation (F.IF.2)

Compare properties of different types of functions each represented in different ways (algebraically, graphically, numerically in tables, or by verbal descriptions) (F.IF.9, F.LE.1)

Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$ and $f(x+k)$ for specific values of k (F.BF.3)

Resources

Desmos Function Bundle

Desmos What's My Transformation?

Khan Academy: Functions

Standards

MA.F-IF.A	Understand the concept of a function and use function notation
MA.F-IF.A.1	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. The graph of f is the graph of the equation $y = f(x)$.
MA.F-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
MA.F-IF.B	Interpret functions that arise in applications in terms of the context
MA.F-IF.B.4	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.
MA.N-Q.A	Reason quantitatively and use units to solve problems.
MA.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
MA.N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling.
MA.F-IF.B.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
MA.F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
MA.F-BF.B	Build new functions from existing functions
MA.F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.
MA.F-LE.A	Construct and compare linear and exponential models and solve problems
MA.F-LE.A.1	Distinguish between situations that can be modeled with linear functions and with exponential functions.
MA.A-REI.D	Represent and solve equations and inequalities graphically
MA.A-REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).