

Unit 4: Introduction to Functions

Cluster: Define, evaluate and compare functions.

Nevada Academic Content Standard

What does this standard mean that a student will know and be able to do? (adapted from North Carolina 8th Grade Standards, *Unpacked Content*)

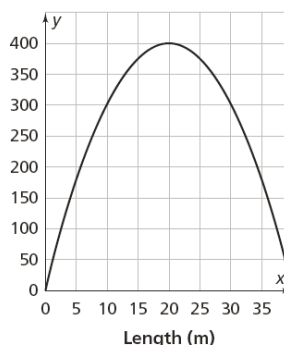
8.F.A.1

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. (Function notation is not required in Grade 8.)

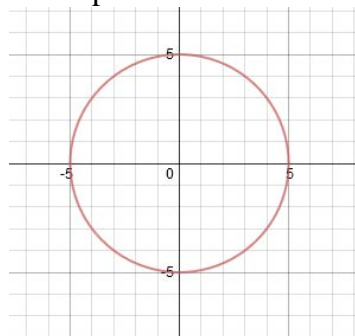
Students understand rules that take x as input and gives y as output as being a function. Functions occur when there is exactly one y -value associated with any x -value. Using y to represent the output we can represent a function with the equations $y = x^2 + 5x + 4$. Students are **not** expected to use the function notation $f(x)$ at this level. Students identify functions from equations, graphs, and tables/ordered pairs.

Graphs

Students recognize graphs (such as the one below) as a function, using the vertical line test, showing that each x value has only one y -value;



whereas, graphs such as the following are not functions since there are two y -values for multiple x -values.



Approximate Time Frame: 1- 2 weeks

Terms:

- | | | |
|------------------------------------|----------------------|-----------------------|
| ✓ ordered pairs | ✓ domain/range | ✓ square root |
| ✓ coordinate plane | ✓ relation | ✓ terminating decimal |
| ✓ x -coordinate/ y -coordinate | ✓ function | ✓ whole number |
| ✓ input/output | ✓ vertical line test | |
| | ✓ mapping diagram | |

Resources

MGH – McGraw Hill, Glencoe Math (2015)

ML – McDougal Littell, Pre-Algebra Book; Larson, 2005

EX – Explorations in Core Math (Holt McDougal)

NY – Engage New York

MAP – Math Assessment Project (MARS)

	<i>Suggested Topics for Lessons</i>	<i>Suggested Resources</i>
Prep for unit	Ordered Pairs & the Coordinate plane	<ul style="list-style-type: none"> ➤ MGH 4-2 Relations (page 277) ➤ ML1.8 The Coordinate Plane (page 47) ➤ EX 2-1 Ordered Pairs (page 47) ➤ EX 2-2 Graphing on the Coordinate Plane (page 51)
8.F.A.1	Defining Functions SBAC Evidence - The student: <ol style="list-style-type: none"> 1. Recognizes that a function is a rule that assigns to each input exactly one output 2. Identifies or produces input/output pairs for given functions 	<ul style="list-style-type: none"> ➤ MGH 4-3 Inquiry Lab: Relations & Functions (page 285) ➤ MGH 4-3 Functions (page 287) ➤ ML 8.1 Relations and Functions (page 385) ➤ EX 2-4 Functions (page 61) ➤ Learn Zillion Lesson Plan: Understand function properties by investigating the input and output of real-world situations ➤ Learn Zillion Video Lesson: Understand a function as a type of relation ➤ Learn Zillion Video Lesson: Defining a function by looking at its parts ➤ Learn Zillion Video Lesson: Determine whether a set of points plotted on a graph is a function ➤ Learn Zillion Video Lesson: Determine whether a graph is a function ➤ Learn Zillion Video Lesson: Determine whether a set of ordered pairs represents a function ➤ Illustrative Math Task: Function Rules ➤ IL Lesson (go to Lesson 2, Segment 1): Defining and Graphing Functions ➤ NY Module 5 Lesson 1: The Concept of a Function ➤ NY Module 5 Lesson 2: Formal Definition of a Function
Prep for 8.F.A.2	Representing functions 4 ways: algebraically, graphically, numerically in tables, verbally <ol style="list-style-type: none"> 3. The student recognizes the same function written in different functional forms (algebraic, graphic, tabular, or verbal). 	<ul style="list-style-type: none"> ➤ MGH 4-4 Linear Functions (page 295) ➤ ML 8.2 Linear Equations in Two Variables (page 391) ➤ Worksheet Works (create your own worksheet): Hundreds of Worksheets ➤ Purple Math: Graphing Linear Equations (Making a Chart) ➤ Learn Zillion Lesson Plan: Describe functions algebraically by examining their graphs and tables ➤ Wikis.iut.tufts Activity: Who Shares my Function-Linear w/All Representations ➤ Wikis.iut.tufts Activity: Who Shares my Function-Linear w/Graphs, Tables, Equations