Technology Integration Workshop
2020

Unit Title: Functions

Grade Level: 10

Subject Area: Algebra 2/Honors Algebra 2

Duration/Length/Number of class periods: 12 class periods (50 min each)

Description:
Students will learn all the basic features of a function including domain, range, continuity, linearity, intercepts, and transformations. They will learn how functions can represent real life situations and how each feature of the graph can tell us important information about that situation. They will also learn how to manipulate functions using transformations in order to make the function better fit a situation.

Established Goals (National, State, Local):

9.2.1.3	Find the domain of a function defined symbolically, graphically or in a real-world context. *For example*: The formula $f(x) = \pi x^2$ can represent a function whose domain is all real numbers, but in the context of the area of a circle, the domain would be restricted to positive x.
9.2.1.4	Obtain information and draw conclusions from graphs of functions and other relations. *For example*: If a graph shows the relationship between the elapsed flight time of a golf ball at a given moment and its height at that same moment, identify the time interval during which the ball is at least 100 feet above the ground.

9.2.1.6	Identify intercepts, zeros, maxima, minima and intervals of increase and decrease from the graph of a function.
9.2.1.9	Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations. *For example*: Determine how the graph of $f(x) = \lvert x - h \rvert + k$ changes as h and k change.
9.2.2.3	Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions.

Other MN Standards addressed: 8.2.1.3, 8.2.2.2, 8.2.2.3, 8.2.4.4, 9.2.1.1, 9.2.1.2

ACT Standards addressed: AF403, 503, 603, 604 (702, 703, 704, 705, 706), A406, 501, 514, F401, 503, 504, 505, 506, 507, 509, 511, 601

What Enduring Understandings are desired?

- How can a mathematical function represent a real life situation?
- What does the domain and range of a function tell us about that situation?
- What features of the graph can I analyze to find out more about the situation?
- How can I use transformations to make adjustments to functions so that they can be the best model for a real life situation?

What Essential Questions will be considered?

How can analyzing a function help you understand the situation it models?

Students will know / be able to:

- Identify the domain and range of a function and whether it is one to one.
- Determine continuity of functions and whether functions are one to one.
- Determine linearity, intercepts, and **symmetry** of functions.
- Identify extrema and end behavior of functions.
- Sketch graphs of functions given key features of the function.
- Graph Linear Functions and Inequalities in Two Variables by hand and using technology.
- Write and graph piecewise-defined and absolute value functions (and step functions).
- Identify and use transformations of Functions and determine how they affect a function.

Description	Formative	Summative	Introductory Activity	Learning Activity	Student Technology Used	Teacher Technology Used	ISTE Standards
Skills Assessment/Pretest Activity (Google Form) (Written Portion)			X		Google Forms/Google Classroom	Google Forms/Google Classroom/Google Sheets, Khan Academy	1c, 1d
Daily Instructional Videos (Sample Lesson Video) (EdPuzzle)				X	YouTube, Google Classroom, Edpuzzle	YouTube, Google Classroom, Edpuzzle, Screencastomatic, Smart Notebook Software	1c, 1d, 3c
Domain and Range Desmos Activity (Teacher Link) (Student Link)				X	Desmos, Google Classroom	Desmos, Google Classroom	1c, 1d, 3c, 4d
Online Daily "Checks"	X				Reveal Textbook Online Resources - SE	Reveal Textbook Online Resources - TE	1c, 1d
Investigating Key Features of Graphs Using Technology				X	Reveal Textbook Online Resources - SE, Graphing	Reveal Textbook Online Resources - TE	1d, 3c. 4a, 4b, 4d, 5c, 7b

					Calculator or Geogebra		
Mid Unit Quiz	X						
Design Satellite Dish or Bridge Using Function Transformations (Project)		X					3d, 4a, 4b, 5c, 7b
Unit Review Goose Chase Scavenger Hunt (Link to Game)				X	Goosechase.edu	Goosechase.edu	1c, 1d, 5c, 7b
Unit Exam		X					

Materials, tools and resources: McGraw Hill Reveal Algebra 2 Textbook and Online Resources, Google Classroom, Teacher Created Instructional Videos, Edpuzzle, Goosechase, Screencastomatic, YouTube, Smart Notebook Software, Graphing Calculator or Geogebra or Desmos, Khan Academy

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I have another UbD template that I had previously created, the link is below for that document:

Alternate Form of UbD Template with more detail in daily lesson plans