01_Functions

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **2 weeks (8-10 Blocks)**
Status: **Published**

General Overview, Course Description or Course Philosophy

Math Lab is designed to support students and cultivate favorable attitudes towards mathematics. This course fosters conceptual understanding and procedural fluency of important content through relevant meaningful mathematical experiences while accommodating for the speed at which students learn. Math Lab encourages and develops problem-solving ability and critical thinking skills. Students will have access to resources that reinforce the curriculum and help to increase mastery of knowledge and skills. Small group instruction will encourage the discovery of mathematical content and support students' efforts to learn and achieve in their study of mathematics.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Objectives/Enduring Understandings:

Students will understand that:

- Functional relationships can be expressed in real contexts, graphs, algebraic equations, tables, and words

Essential Questions:

- Why does one need to define a function?
- When should functions be evaluated and compared?
- How does knowing the algebraic properties of a function help to graph that function?

CONTENT AREA STANDARDS

MA.N-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
MA.N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling.
MA.F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.

MA.F-BF.A.1a	Determine an explicit expression, a recursive process, or steps for calculation from a context.
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.A.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.
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.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
MA.F-LE.A.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
MA.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
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).
MA.A-SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
MA.A-SSE.A.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand:

- the definition of a function
- characteristics of a function
- function notation
- the set of all solutions of an equation forms its graph
- mapping diagram and vertical line test

- the definition of an arithmetic sequence

Procedural Knowledge

Students will be able to:

- create function tables by evalating functions in their domains
- define a function using tables, equations, and graphs
- analyze real-world situations and write equations to represent them
- apply the vertical line test and mappying diagram to determine whether or not a relation is a function
- identify and extent patterns in sequences
- create equations in function notation to represent arithmetic sequences
- identify recursive and explicit formulas for arithmetic sequences and use the formulas to extend the sequence

EVIDENCE OF LEARNING

Formative Assessments

- Student daily participation
- Student self-assessment
- Skills checklists
- Student-friendly proficiency scales
- Teacher feedback

Summative Assessments

- Assessment Reflection

RESOURCES (Instructional, Supplemental, Intervention Materials)

Kuta Software

Desmos Activities ([Function Carnival](), [Function Carnival Part 2](), [Functions Sort]())

Nearpod Activities ([What are Functions?](), [Evaluating Functions Practice]())

https://quizizz.com/collection/60e4463c853dc5001b788fca

[Assessment Reflection]()

INTERDISCIPLINARY CONNECTIONS

- Functions can be used to model real-world situations
- Knowledge of functions can be utilized in chemistry, physics, and computer science

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.