Module 1 Topic 1

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **9 Sessions**
Status: **Published**

Quantities and Relationships

Standards

MATH.9-12.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.
MATH.9-12.N.Q.A.2	Define appropriate quantities for the purpose of descriptive modeling.
MATH.9-12.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 $y = f(x)$.
MATH.9-12.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.
MATH.9-12.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.
MATH.9-12.F.IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
MATH.9-12.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).

Learning Objectives

- Lesson 1: Students identify the independent and, dependent quantities in given contexts., They match graphs to the scenarios, they model. Students then compare, and contrast the graphs' characteristics,, noticing that graphs are lines,, connected line segments, or curves that, increase, decrease, or both increase, and decrease. They write a scenario, and sketch a graph for a given context

- Lesson 2: Students sort graphs into groups, based onbtheir own rationale and, label each groupnaccording to its, unique characteristics. They reason, why selected graphs are in the same, group; they consider discrete graphs,, graphs with vertical symmetry, and, graphs that do not represent, functions. Students compare, their groupings to those of their, classmates to generate a list of, graphical behaviors.

- Lesson 3: Students determine whether relations, are functions. They identify increasing,, decreasing, or constant graphs as, linear or exponential functions,, graphs with an absolute maximum, or minimum as quadratic or linear, absolute value functions, and graphs, with equation changes for different, domain parts as linear piecewise, functions. They use technology to, match each graph with its equation.

- Lesson 4: Students determine whether a, graph's characteristics apply to the, linear, exponential, quadratic, linear, absolute value, or linear piecewise, function family. They identify the, function family, its

domain, and the, graph's behavior for the matched, scenarios and graphs from the, first lesson. Students write an, equation based on a function and its, characteristics and use technology to, sketch its graph.

Essential Skills

- Lesson 1: When one quantity depends on another in a situation, it is the dependent quantity. The, quantity it depends on is the independent quantity., • You can use a graph to model a scenario., • Label the x-axis with the independent quantity and the y-axis with the dependent quantity., • Characteristics of a graph include whether the graph increases or decreases, is, composed of line segments or a curve, or has a maximum or minimum point.
- Lesson 2: A graph describes the relationship between an independent quantity and a dependent, quantity. A graph may include these characteristics:, • Points that are or are not connected, • A line, a curve, or connected segments or curves, • A minimum, maximum, or no minimum or maximum, • Increasing, decreasing, constant, or both increasing and decreasing components, • Vertical or horizontal symmetry, • An x-value with one or more than one y-value.
- Lesson 3: A relation is the mapping between a set of input values called the domain and a set of, output values called the range., • A function is a relation that assigns to each element of the domain exactly one element, of the range., • Function families have distinctive forms, where a, b, and c are real numbers., • Linear functions: $f(x) = ax + b$, • Exponential functions: $f(x) = a \cdot b^{*} + c$, where b is greater than 0 but is not equal to 1, • Quadratic functions: $f(x) = ax2 + bx + c$, where $a \neq 0$, • Linear absolute value functions: $f(x) = a|x + b| + c$, where $a \neq 0$, • Linear piecewise functions have different equations for different pieces of the domain.
- Lesson 4: Each function family has certain graphical behaviors, with some behaviors common, among different function families., • An equation's values determine most of the function's characteristics. To show a, function is discrete, you must identify the domain., • You need an equation, not just a list of characteristics, to generatea unique graph.

Instructional Tasks/Activities

- Arts inspired projects
- Exit Ticket
- Formative Assessments
- Graphic Organizers
- Ladder Activity
- Mathia
- Pie Activity
- Quizizz
- Review, makeup assignments, complete missing assignments, absent work
- Stations or rotational activities
- Workbook Pages
- Worksheets

Assessment Procedure

- Exit Ticket/Entrance Ticket/Do Now

- Kahoot
- Problem Correction
- Project
- Quiz
- Review
- Rubric
- Teacher Collected Data
- Test
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Chromebook
- Diffit
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Forms
- Google Slides
- Kahoot
- MagicSchool AI
- MATHia
- Online assessments
- Power Point
- Quizizz
- Screencastify

Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

Gifted and Talented

- Compare & Contrast
- Conferencing

- Debates
- Jigsaw
- Peer Partner Learning
- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- large print
- modified quiz as needed
- modified test as needed
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)
- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

Environment

- alter physical room environment
- assign peer tutors/work buddies/note takers
- assign preferential seating
- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

Resources

- Carnegie Learning MATHbook
- Diffit
- www.KhanAcademy.com

State Mandated Topics in the Unit

State Mandated Topics Addressed in this Unit	
N/A	N/A