Mp1c-Linear Functions

Content Area: **Math**
Course(s): **Math 8 Algebra 1 Honors**
Time Period: **Marking Period 1**
Length: **MP1**
Status: **Published**

Essential Questions

- Why are graphs useful?

Big Ideas

- Reason quantitatively and use units to solve problems.
- Represent and solve equations and inequalities graphically.
- Interpret functions that arise in applications in terms of the context.
- Analyze functions using different representations.

Diversity Integration

Objective: Students will be able to tell the differences between linear (arithmetic) and exponential (geometric) growth.

Description of Activity: The differences between linear (arithmetic) and exponential (geometric) growth functions are emphasized in this lesson. A student page instructs students to locate four specific sites on the Internet. After data is collected on the student worksheet, pattern predictions are made. Graphing the collected data is done using Desmos Graphing Calculator or by using pencil and grid paper. Student description and analysis concludes the lesson.

Enduring Understandings

Quantities

N.Q.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.

Reasoning with Equations & Inequalities

A.REI.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).

Interpreting Functions

F.IF.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. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F.IF.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.

F.IF.7a   Graph linear and quadratic functions and show intercepts, maxima, and minima.

Building Functions

F.BF.2   Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.

Linear, Quadratic, & Exponential Models

F.LE.1a   Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

F.LE.1b   Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.

F.LE.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).