WAKE COUNTY PUBLIC SCHOOL SYSTEM

Middle School Programs
Building Healthy Core Learning
Common Core Math I, Unit 3

Math I UNIT 3 OVERVIEW: Two Variable Equations & Functions

Unit Outcomes At the end of this unit, your student should be able to:	**Key Vocabulary** Terms to deepen the student's understanding
✓ Construct models of functions using graphs, equations, and tables ✓ Use function notation and interpret statements that use function notation in terms of their context ✓ Describe the real world meaning of the domain of a function ✓ Calculate and interpret the average rate of change of a function from a graph, table or an equation ✓ Write a function that describes a relationship between two quantities	✓ Domain ✓ Explicit Equation ✓ Input ✓ Iteration ✓ Output ✓ Range ✓ Recursive Equation ✓ Relation ✓ Sequence ✓ Function ✓ Vertical Line Test
Key Standards Addressed Connections to Common Core/NC Essential Standards	**Where This Unit Fits** Connections to prior and future learning
8.F.1 Understand that a function is a rule that assigns to each input exactly one output. 8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph 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. 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 F-IF.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 F-IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. *Note: At this level, the focus is linear and exponential functions.* F-IF.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.	**Coming into this unit, students should have a strong foundation in:** ✓ Operations with integers ✓ Solving 1 variable equations ✓ Plotting points on a coordinate plane ✓ Basic knowledge of exponents **This unit builds to the following future skills and concepts:** ✓ Solving linear, quadratic, & exponential equations ✓ Solving systems of equations and inequalities through graphing ✓ Graphing and analyzing more complex functions (including inverse, step, exponential, absolute value, trigonometric and logarithmic functions) ✓ Using regression lines to predict linear, quadratic and exponential models

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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. Note: At this level, focus on linear, exponential and quadratic functions; no end behavior or periodicity.*

F-IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function. Note: At this level, focus on linear and exponential functions*

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. *Note: At this level, focus on linear functions and exponential functions whose domain is the subset of integers*

F-BF.1 Write a function that describes a relationship between two quantities

F-BF.3 Identify the effect on the graph of replacing *f(x)* by *f(x) + k, k f(x), f(kx)*, and *f(x + k)* for specific values of k (both positive and negative); find the value of *k* given the graphs

Additional Resources Materials to support understanding and enrichment	**"Learning Checks"** Questions Parents Can Use to Assess Understanding
✓ Teaching videos made by Wake County teachers ✓ WCPSS YouTube Channel – Math Playlist ✓ Rate of change/slope overview (video) ✓ Finding rate of change from a graph (practice) ✓ Domain and range overview (video) ✓ Finding domain and range (practice) ✓ Determining if a relation is a function (practice) ✓ Determining if a graph is a function (practice) ✓ Rate of change (formative assessment)	✓ How can the relationship between two quantities be described or represented? ✓ How are the key features such as rate of change identified, described, and interpreted from different representations of functions? ✓ How do you decide which representations of a function are most useful for solving problems in different mathematical and real world settings?