Hattiesburg Public School District
Algebra I Mathematics Units
2015 – 2016

Unit 4: Linear Functions	**Time Frame:** 2 Weeks (Sept 16 – Oct 2)
Content Standards	**Standards for Mathematical Practice**
Major Standards	
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). **A-REI.D.11:** Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.* **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.* **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. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity*	(1) Make sense of problems and persevere in solving them. (2) Reason abstractly and quantitatively.*** (3) Construct viable arguments and critique the reasoning of others. *** (4) Model with mathematics. *** (5) Use appropriate tools strategically. *** (6) Attend to precision. (7) Look for and make use of structure. **** (8) Look for and express regularity in repeated reasoning. * ****NOTE: MPs taken from the FlipBook by McGraw Hill.**

F-IF.B.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*. **F-IF.B. 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. **S-ID.C.7:** Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.* **S-ID.C.8**: Compute (using technology) and interpret the correlation coefficient of a linear fit.* **S-ID.C. 9:** Distinguish between correlation and causation.*	
Supporting Standards	
F-IF.C.7: Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ● a. Graph linear ~~and quadratic~~ functions and show intercepts, ~~maxima, and minima.~~ **F-IF.C.9:** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*	

F-LE.A.1: Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals ~~and that exponential functions grow by equal factors over equal intervals~~. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. **F-LE.B.5:** Interpret the parameters in a linear or ~~exponential~~ function in terms of a context.* **S-ID.B.6:** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, ~~quadratic, and exponential~~ models. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.	
Additional Standards	
F-BF.B.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. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.*	

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Pre-requisite Standards				
Lesson 1	**Lesson 2**	**Lesson 3**	**Lesson 4**	**Lesson 5**
Lesson 6	**Lesson 7**	**Lesson 8**	**Lesson 9**	**Lesson 10**