

## NJDOE MODEL CURRICULUM PROJECT

<b>CONTENT AREA: Mathematics</b>	<b>Course: Algebra 1</b>	<b>UNIT #: 5</b>	<b>UNIT NAME: Functions and Descriptive Statistics</b>
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#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
<b>1</b>	Write linear and exponential functions (e.g. growth/decay and arithmetic and geometric sequences) from graphs, tables, or a description of the relationship, recursively and with an explicit formula, and describe how quantities increase linearly and exponentially over equal intervals.	F.LE.1 F.LE.2
<b>2</b>	Represent data on the real number line (i.e. dot plots, histograms, and box plots) and use statistics to compare and interpret differences in shape, center, and spread in the context of the data (account for effects of outliers).	S.ID.1 S.ID.2 S.ID.3
<b>3</b>	Use the mean and standard deviation of a data set to fit it to a normal distribution, estimate population percentages, and recognize that there are data sets for which such a procedure is not appropriate (use calculators, spreadsheets, and tables to estimate areas under the normal curve).	S.ID.4
<b>4</b>	Summarize and interpret categorical data for two categories in two-way frequency tables; recognize associations and trends in the data.	S.ID.5
<b>5</b>	Represent and describe data for two variables on a scatter plot, fit a function to the data, analyze residuals (in order to informally assess fit), and use the function to solve problems. <i>a) Uses a given function or choose a function suggested by the context. Emphasize linear and exponential models.</i>	S.ID.6
<b>6</b>	Interpret the slope, intercept and correlation coefficient (compute using technology) of a linear model.	S.ID.7 S.ID.8
<b>7</b>	Distinguish between correlation and causation in a data context.	S.ID.9

**Major Content** **Supporting Content** **Additional Content** (Identified by PARCC Model Content Frameworks).

**Bold type indicates grade level fluency requirements.** (Identified by PARCC Model Content Frameworks).

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### Selected Opportunities for Connection to Mathematical Practices

- 1. Make sense of problems and persevere in solving them. \***
  - 2. Reason abstractly and quantitatively.**  
Examine several related events determine if the relationship is correlation or causation. Ex. Watching TV and getting a low score on a test.
  3. Construct viable arguments and critique the reasoning of others.
  - 4. Model with mathematics. \***
  - 5. Use appropriate tools strategically.**  
SLO 6 Compute the correlation coefficient for a linear model using technology.
  - 6. Attend to precision.**  
SLO 5 Create data displays and give oral or written descriptions, in context, using explicit language.
  7. Look for and make use of structure.
  8. Look for and express regularity in repeated reasoning.
- \*MP.1 and MP.4 are overarching practices relevant to Algebra 1. (PARCC Model Content Frameworks).  
*All of the content presented in this course has connections to the standards for mathematical practices.*

***Bold type identifies possible starting points for connections to the SLOs in this unit.***

Code #	Common Core State Standards
<b>S.ID.1</b>	Represent data with plots on the real number line (dot plots, histograms, and box plots).
<b>S.ID.2</b>	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
<b>S.ID.3</b>	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
<b>S.ID.4</b>	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to

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	estimate areas under the normal curve.
<b>S.ID.5</b>	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
<b>S.ID.6</b>	<p>Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.</p> <ol style="list-style-type: none"> <li>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. <i>Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.</i></li> <li>b. Informally assess the fit of a function by plotting and analyzing residuals.</li> <li>c. Fit a linear function for a scatter plot that suggests a linear association.</li> </ol>
<b>S.ID.7</b>	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
<b>S.ID.8</b>	Compute (using technology) and interpret the correlation coefficient of a linear fit.
<b>S.ID.9</b>	Distinguish between correlation and causation.
<b>F.LE.1</b>	<p>Distinguish between situations that can be modeled with linear functions and with exponential functions.</p> <ol style="list-style-type: none"> <li>a. Prove that linear functions grow by equal differences over equal intervals; and that exponential functions grow by equal factors over equal intervals.</li> <li>b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.</li> <li>c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative another.</li> </ol>
<b>F.LE.2</b>	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).

**Major Content** **Supporting Content** **Additional Content** (Identified by PARCC Model Content Frameworks).

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