Unit 6
Probability and Statistics

Algebra I

Unit Description:

Students will study univariate data using statistics, compare different distributions, and analyze for similarities and differences. Bivariate categorical data will be arranged in two-way frequency tables. Numerical bivariate data will be graphed and the "best-fit" line will be used to summarize and predict trends in the data. Technology will be used to calculate measure of strength in relationships, as well as correlation and causation.

Standards for Mathematical Practice

MP.1 Make sense of problems and persevere in solving them.
MP.2 Reason abstractly and quantitatively.
MP.3 Construct viable arguments and critique the reasoning of others.
MP.4 Model with mathematics.
MP.5 Use appropriate tools strategically.
MP.6 Attend to precision.
MP.7 Look for and make use of structure.
MP.8 Look for and express regularity in repeated reasoning.

Louisiana Student Standards for Mathematics (LSSM)

S – Statistics and Probability ID – Interpreting Categorical and Quantitative Data	
A. Summarize, represent, and interpret data on a single count or measurement variable.	
S-ID.A.2	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.
S-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
B. Summarize, represent, and interpret data on two categorical and quantitative variables.	
S-ID.B.5	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.
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.
C. Interpret linear models.	
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.

***As defined by LSSM, the basic modeling cycle involves:**
1. identifying variables in the situation and selecting those that represent essential features,
2. formulating a model by creating and selecting geometric, graphical, tabular, algebraic, or statistical representations that describe relationships between the variables,
3. analyzing and performing operations on these relationships to draw conclusions,
4. interpreting the results of the mathematics in terms of the original situation,
5. validating the conclusions by comparing them with the situation, and then either improving the model or, if it is acceptable,
6. reporting on the conclusions and the reasoning behind them.

Choices, assumptions, and approximations are present throughout this cycle.

Enduring Understandings:

*The way that data is collected, organized, and displayed influences interpretation.
*Describing center, spread, and shape is essential analysis of both univariate and bivariate data.
*Mathematical models are used to predict and make inferences about data.
*Mathematics can be used to solve real world problems and can be used to communicate solutions.

Essential Questions:

*How do various representations of data lead to different interpretations of the data?
*How are center and spread of data sets described and compared?
*What information is appropriate to interpret from a data-based model?
*How can mathematical representations be used to communicate information effectively?