Anoka-Hennepin Secondary Curriculum Unit Plan

Department:	Mathematics	Course:	Intermediate PreAlgebra	Unit 9 Title:	Data and Probability (Experimental, Theoretical and Geometric)	Grade Level(s):	7
Assessed Trimester:	Trimester 3	Pacing:	8-13 Days	Date Created:	5/31/2014	Last Revision Date:	6/18/2014

Course Understandings: *Students will understand that:*

A. There are multiple strategies and representations that can be used to solve real world problems involving rational numbers.
C. Proportional reasoning and percents can be used to solve real world problems.
E. Probabilities can be used to predict situational outcomes.
F. There are multiple ways to represent data and interpret the results.
G. There are appropriate uses for various technologies and that limitations may exist with them.

DESIRED RESULTS (Stage 1) - WHAT WE WANT STUDENT TO KNOW AND BE ABLE TO DO?

Established Goals

Minnesota State/Local/Technology Standard(s) addressed (2007):

- **Standard (7.4.1.#):** Use mean, median, and range to draw conclusions about data and make predictions.
  Benchmark:
  7.4.1.1 Design simple experiments and collect data. Determine mean, median, and range for quantitative data and from data represented in a display. Use these quantities to draw conclusions about the data, compare different data sets, and make predictions.
  7.4.1.2 Describe the impact that inserting or deleting a data point has on the mean and median on a data set. Know how to create data displays using a spreadsheet to examine the impact.

- **Standard (7.4.2.#):** Display and interpret data in a variety of ways, including circle graphs and histograms.
  Benchmark:
  7.4.2.1 Use reasoning with proportions to display and interpret data in circle graphs (pie charts) and histograms. Choose the appropriate data display and know how to create the display using a spreadsheet or other graphing technology.

- **Standard (7.4.3.#):** Calculate probabilities and reason about probabilities using proportions to solve real-world and mathematical problems.
  Benchmark:
  7.4.3.1 Use random numbers generated by a calculator or a spreadsheet or taken from a table to simulate situations involving randomness, make a histogram to display the results, and compare the results to known probabilities.
  7.4.3.2 Calculate probability as a fraction of sample space or as a fraction of area. Express probabilities as percents, decimals and fractions.
  7.4.3.3 Use proportional reasoning to draw conclusions about and predict relative frequencies of outcomes based on probabilities.

Transfer

Students will be able to independently use their learning to: (product, high order reasoning)

- Solve real-world and mathematical problems involving probabilities and measures of central tendency.

Meaning

Unit Understanding(s):	Essential Question(s):
Students will understand that: ● Predictions can be made using numerical and geometric probabilities. ● Adding or removing a data point affects the measures of central tendency. ● There are multiple representations of data and know how to determine the most appropriate representation. ● Various data displays can be used to determine measures of central tendencies and make predictions.	**Students will keep considering:** ● How is the probability of an event determined and described? ● How does the type of data influence the choice of display? ● How can information be gathered, recorded, and organized? ● Why is data collected and analyzed? ● How do people use data to influence others? ● How can predictions be made based on data? ● How is probability used in everyday life?

Acquisition

Knowledge - Students will:	Skills - Students will:
● Understand mean, median, range, and outliers. ● Understand how to write probability as a fraction, decimal, and percent. ● Identify sample space ● Understand and define probability. ● Understand the meaning of probability as part/whole. ● Understand data displays such as circle graphs, histograms, frequency tables, and stem-and-leaf plots. **Reasoning - Students will:** ● Choose appropriate measure of central tendency. ● Draw conclusions resulting from data. ● Predict the impact of inserting or deleting a data point and how it affects the mean and median of a data set. ● Predict and justify frequencies of probability outcomes. ● Develop a plan for organizing data. ● Choose the appropriate data display given the data. ● Predict and justify frequencies of probability outcomes.	● Determine mean, median, and range. ● Create a circle graph or histogram. ● Carry out the appropriate computation to find the geometric probability. ● Use an experiment to find the experimental probability. ● Use multiple technologies to display data.

Common Misunderstandings	Essential new vocabulary
● Students forget to find the average when finding the median of an even set of numbers. ● When students are asked to find the mean of a data set and have access to their calculator, they may forget to enter the calculations using the correct order of operations. ● When finding the median students may forget to put the data in order from least to greatest. ● As students make histograms, sometimes they do not use equal intervals on the horizontal axis. ● Students may assume the percent shown on a circle graph is the equal to the number of responses in that category. (24% means 24 people) ● Students may confuse experimental probability and theoretical probability. ● Students often draw incorrect conclusions about how probability works in real life situations. For example, a student may claim that since the probability of getting tails is 0.5, tails will come up twice after 4 coins flips. Explain that if an event has a 50% probability, this does not mean it happens 50% of the time in application.	● Circle Graph ● Frequency Table ● Histogram ● Outlier ● Stem-and-Leaf Plot