Unit 3b- Use Sampling to Draw Inferences About Populations

Content Area: **Math**
Course(s): **Math 7 PRE-ALGEBRA**
Time Period: **Marking Period 3**
Length: **WK 3-5 Envision Mathematics Topic 8**
Status: **Published**

Essential Questions

- How can sampling be used to draw inferences about one or more populations?

Big Ideas

- Use random sampling to draw inferences about a population.
- Draw informal comparative inferences about two populations.

Cross Curricular Integration

Integration Area: Science

MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Activity: Students will draw inferences about data to develop a walking and bicycling path for shared public use. They will use random sampling techniques to gather information about preferences of the people that are likely to use the path.

Diversity Integration

Objective: Students will take the data from 6th grade on heritage and discuss if it is a good representation of the school.

Students will be able to talk about random sampling and come up with a new survey to complete using random sampling.

Description of Activity: Students will use the data found from the 6th grade data to discuss random sampling and how they could fix the method to be able to generalize the results.

Students will then come up with their own survey to complete a random sample with in the school and complete.

Students will then discuss their results from their random sampling.

CSDT Technology Connection

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose

Enduring Understandings

Ratios and Proportional Relationships

7.RP.3 Use proportional relationships to solve multi-step ratio and percent problems. Examples: Simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

Statistics and Probability

7.SP.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are only valid if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

7.SP.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how

far off the estimate or prediction might be.

7.SP.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team; about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.

Mathematical Practices Focus

1. Make sense of problems and persevere in solving them. Lesson 1,2,3, page 353
2. Reason abstractly and quantitatively. Lesson 1,2,3,4, page 353
3. Construct viable arguments and critique the reasoning of others. Lesson 1,2,4,page 353
4. Model with mathematics. Lesson 2,3,4, page 353
5. Use appropriate tools strategically. Page 353
6. Attend to precision. Lesson 1
7. Look for and make use of structure. Page 353
8. Look for and express regularity in repeated reasoning. Lesson 1,3,4, page 353