Sampling: Opinions

Strand: Data Analysis

Topic: Surveying and polling

Primary SOL: AFDA.8   The student will design and conduct an experiment/survey. Key concepts include
  a) samples size;
  b) sampling technique;
  c) controlling sources of bias and experimental error;
  d) data collections; and
  e) data analysis and reporting.

Related SOL: AFDA.6, AFDA.7

Materials
- Politics and Opinions activity sheet (attached)
- Spreadsheet application

Vocabulary

bias, cluster sampling, experimental error, normal distribution, population, qualitative, quantitative, randomness, sample size, standard deviation, simple random sampling, stratified sampling

Student/Teacher Actions: What should students be doing? What should teachers be doing?

Time: 90 minutes

1. Have students research different methods used for political polling, including cluster sampling, stratified sampling, and simple random sampling.

2. Distribute the Politics and Opinions activity sheet and have students complete.

Assessment
- **Questions**
  - How does sample size and randomness affect the accuracy in sampling?
  - Would surveying your classmates give an accurate representation of school opinions? Why or why not?

- **Journal/writing prompts**
  - Describe how sampling techniques can be manipulated to make the data appear to reflect desired results.
  - Create a brochure for a fictitious polling company explaining the sampling methods your company will use and how you believe it is the most accurate. Afterward, you will make a short pitch to your prospective clients (the class).

- **Other Assessments**
  - Create an slip in which students need to compare the different sampling techniques.

- o Have students design a survey, including a plan on how they would sample their community to determine the most popular sports team. The plan should explain how they determined sample size.

Extensions and Connections

- Expand the activity sheet to become a unit-long project.

- Have students survey a sample of the student body to predict the winners of class officer elections (or prom court). After the final results are announced, have students compare the results and explain any variations and why they may have occurred.

- Have students research historic polling as it relates to previous elections (either state or national) and determine how accurate the data has been.

Strategies for Differentiation

- Have students complete data collection on a tablet or with a digital survey posted online.

- Use vocabulary cards for related vocabulary listed above.

- Have students complete a graphic organizer where they must list the characteristics, processes, and sources of bias that could exist for each of the sampling techniques discussed.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

Politics and Opinions

You have been hired by the School Board to answer this question about *all* of the students/teachers in your school: How much homework do teachers assign and/or do students do? Unfortunately, you cannot possibly get that from everyone, so you decide to take a sample and use the data from your sample to make conclusions about the entire school population.

Initial Questions

1. What types of quantitative questions do you think need to be asked?

2. What qualitative questions should be asked?

3. What type of demographic information might be useful to the School Board?

4. Because you are going to use a sample, which type of sampling strategy will get you the most accurate information? How many students need to be included in the sample?

5. What types of things could bias your sample in this survey that you have created? What steps can you take to reduce and address bias of those completing the survey?

6. Construct a five- to eight-question survey that contains quantitative and qualitative questions. Be sure to include the personal data you want as well.

Mathematics Instructional Plan–AFDA

Homework Survey

The purpose of the survey is to find out information requested by the School Board.

1.

2.

3.

4.

5.

6.

7.

8.

---

7. Describe the plan you have to gather the sample data. Include the number in your sample, your strategy, and timeline.

Sample Description

---

8. In a spreadsheet, organize your data and determine what statistics you will need to use in your presentation to the School Board.

9. For your numeric data (i.e., minutes of homework done daily), calculate the mean and standard deviation of the sample. Assuming that this is a normal distribution, determine the likelihood that a student in the school population would study more than 60 minutes.

10. Anticipate what information the School Board might want to know about the study and how the research was conducted. Prepare a five- to 10-minute presentation to explain how you conducted the survey and interpreted your results.