AFM - Unit Statistics
Notes 2-7, Samples and Surveys

Name _____
Date _____ Period _____

A population is all the members of a set.

A sample is part of a population.

If you determine a sample carefully, it can give a good estimate of the total population.

Sampling Types and Methods

1. Convenience Sample - select any members of the population who are conveniently and readily available.
2. Self-Selected Sample - select only members of the population who volunteer for the sample.
3. Systematic Sample - order the population in some way, and then select from it at regular intervals.
4. Random - all members of the population are equally likely to be chosen. 5. Cluster Sample - natural groups in population and select samples from each group.
6. Stratified Sample - divided by strata and select samples from each group.

A bias is a systematic error introduced by the sampling method.

Example 1 Analyzing Sampling Methods

A newspaper wants to find out what percent of the city population favors a property tax increase to raise money for local parks. What is the sampling method used for each situation? Does the sample have a bias? Explain.

A. A newspaper article on the tax increase invites readers to call the paper and express their opinions. Self-selected
Bias - only people who care may call and express opinions
age bias

B. A reporter interviews people leaving the city's largest park.
Convenience
Bias - only representation from people who use parks

C. A survey service calls every 50th listing from the local phone book.

Systematic Bias- only people with land lines age bias

Study Methods

1. Observational Study - measure or observe members of a sample in such a way that they are not affected by the study.
2. Controlled Experiment - divide the sample into two groups. You impose a treatment on one group but not on the other "control" group. Then you compare the effect on the treated group to the control group.
3. Survey - ask every member of the sample a set of questions.
4. Simulation - uses a probability experiment to mimic a real-life situation.

A poorly written survey question can introduce bias. It should avoid:

- Combining two or more issues
- Using double negatives
- overlapping answer choices
- Words that cause strong reactions (loaded questions)
- Suggesting that you want a particular answer (leading)

Example 2 Analyzing Survey Questions

Is there any bias in the survey question? Explain.

A. Do you think farmers should use poison to control insects on crops?

loaded question

B. Don't you agree that most childcare workers are underpaid?

leading

C. Do you think teachers should communicate frequently with students and their parents about class grade?

↓ make 2 questions