

Math 7H - Unit 6

Day 3 - Avoiding Bias

Lesson Objectives:

- I understand generalizations about a population from a sample are valid only if the sample is representative of that population.

To get valid results from a survey, a sample must be chosen very carefully. If a sampling method is valid, you can make generalizations about the population.

Bias is the tendency to skew results or favor one answer over another.



The tumultuous town mayor (from yesterday's Bell Work) wants to re-route the town bus routes. So, he goes to the two nearest bus stops and asks riders for their opinions.

Describe the good and not-so-good parts of this approach.

A **convenience sample** consists of members of a population that are easily accessed.

A radio station asks its listeners to call in with their preference for the tumultuous mayor or his opponent in an upcoming election.

Describe the good and not-so-good parts of this approach.

A **voluntary response sample** involves only those who want to participate in the sampling.

Both convenience samples and voluntary response samples are biased. One or more parts of the population are being favored over others.

Every tenth person who walks into city hall is surveyed to determine his or her music preference.

Describe the good and not-so-good parts of this approach.

In a **systematic random sample** items or people are selected according to a specific time or item interval.

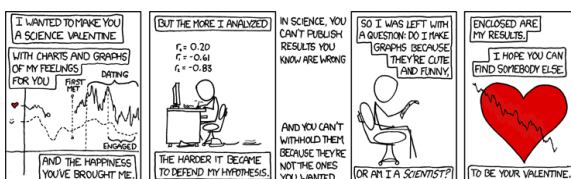
The tumultuous town mayor decides he can't talk to every household to get ideas for a new trash plan. So, he puts all the town's phone numbers into a large hat and chooses at random some numbers to call.

Describe the good and not-so-good parts of this approach.

In a **simple random sample** each item or person in the population is as likely to be chosen as any other.

Both systematic random samples and simple random samples are unbiased. These samples accurately represent the entire population.

Bias can be created by too small of sample size, volunteering to participate in a survey, questions that lead to a certain answer, and not wanting to look bad with an answer.



I'd Like to Know Where You Got the Notion



Determine whether each conclusion is valid. Justify your answer.

1. To evaluate the quality of their product, a manufacturer of cell phones checks every 50th phone off the assembly line. Out of 200 phones tested, 4 are defective. The manager concludes that about 2% of the cell phones produced will be defective.

2. To determine whether the students will attend an arts festival at the school, Oliver surveys his friends in the art club. All of Oliver's friends plan to attend. So, Oliver assumes that all the students at his school will also attend.

5. A researcher wants to find out how much money the average Utah family spends to heat their home during the winter. Seventy randomly selected families from St. George are surveyed. Of the families, 60 said that they spend less than \$100 on heating during the winter. The researcher concluded that the average Utah family spends less than \$100 on heating during the winter. Is the conclusion valid? Explain.

Determine whether each conclusion is valid. Justify your answer.

3. A magazine asks its readers to complete and return a questionnaire about popular television actors. The majority of those who replied like one actor the most, so the magazine decides to write more articles about that actor.

4. To determine what people in California think about a proposed law, 5,000 people from the state are randomly surveyed. Of the people surveyed, 58% are against the law. The legislature concludes that the law should not be passed.

Homework

Bias & Unbiased Samples WKS

* Individual Think Time *



What to do if you get stuck...

1. Reread the problem. Did you write it down correctly?
2. Reread your notes. Is there a problem similar that we did together in class?
3. Find a problem similar in your book. Try this one to see if it helps.
4. Skip the problem until the end of Individual Think Time. Then ask an "educated" question of a neighbor or Mrs. Call.

Today we're working by...

