

Study Design: Part 1

- Topics: Statistical Questions and Valid Claims
- Objective: Students will be able to determine if statistical questions have valid claims, and infer information from a sample to the larger population.
- Standards: CCSS Math: 6.SP.A.1, Math: 7.SP.A.1, 7.SP.A.2, AP Stats: DAT-2 (EU), DAT-2.A (LO), DAT-2.A.1 (EK), DAT-2.A.2 (EK)

What is a Statistical Question?

Definition: A statistical question is one that can be answered by collecting data and where there will be variability in that data.

For example, there will likely be variability in the data collected to answer the question, "How much do the animals at Fancy Farm weigh?" but not to answer, "What color hat is Sara wearing?".

Making a Valid Claim

Definition: To make a valid conclusion, you'll need a representative, not skewed, sample.

Example: Yonkers Public Schools wants to know if it should spend \$300 thousand to redo the football field at Gorton HS.

Which of the following survey methods will allow YPS to make a valid conclusion about whether residents of the district support the proposed plan?

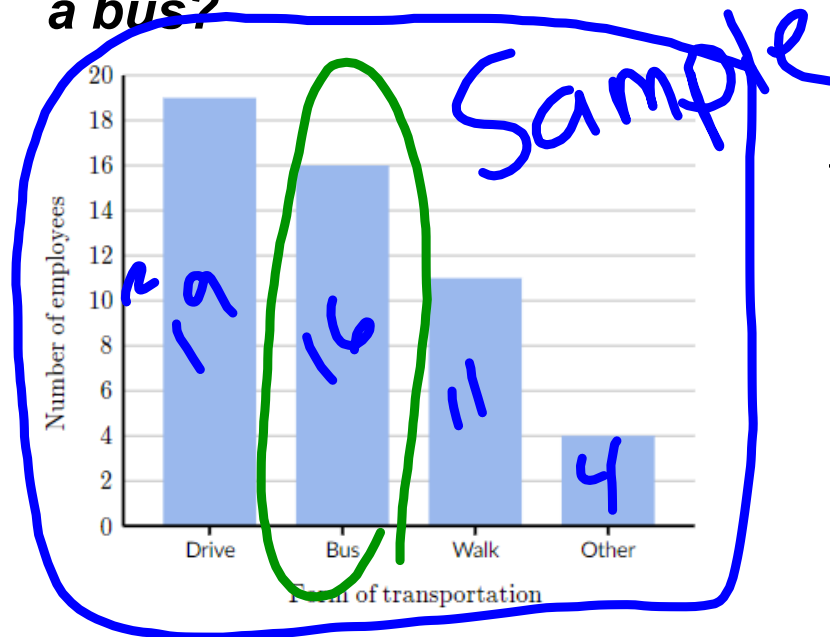
- Ask 200 people attending various sporting events at Yonkers High Schools.
- Ask 200 residents of the district whose names are chosen at random.

Bias

Making Inferences from Random Sample

Given a sample of data, extrapolate it to the larger population.

Example: A group of randomly selected Clyde Marketing employees were asked what their most common form of transportation is. The bar graph below shows the results of the survey. There are 275 employees at Clyde Marketing. **Based on the data, what is the most reasonable estimate for the number of Clyde Marketing employees whose most common form of transportation is riding a bus?**



Handwritten calculations and notes:

- 16 (Sample)
- 275 (Population)
- $\frac{\text{Sample}}{\text{Population}} = \frac{\text{Inference}}{\text{Population}}$
- 50 (Sample)
- 275 (Population)
- $275(16) = 50 \times$
- $4400 \div 50 = 88$
- $x = 88$

SS: Identifying the Population and Sample

Identify who the population and sample in this setting.

Example: The owners of a sports stadium wanted to predict what additional refreshment options would sell well. They selected 80 seat numbers at random and surveyed the occupants of those seats.

Identify the population and sample in this setting.

-  The population is all people who buy refreshments in the sports stadium; the sample is the occupants of the 80 selected seats.
-  The population is the occupants of the 80 selected seats; the sample is the refreshment options.
-  The population is the occupants of all seats in the sports stadium; the sample is the occupants of the 80 selected seats.

Displaying and Comparing Quantitative Data

You should be working on the following skills:

1. Statistical questions
2. Valid claims
3. Making inferences from random samples
4. Identifying the population and sample

Attachments

Ztable.pdf