Warm up

BYOT or Work on Super Bowl Data for 15 mins

10-2 Populations and Samples

EQ: How do you compare and analyze sampling methods?

Standard

- **MCC7.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 valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

County Introduction

https://www.youtube.com/watch?v=7nr9rQpm2A4

WHEN INFORMATION IS GATHERED ABOUT A GROUP, SUCH AS THE DEER IN NORTH AMERICA, THE ENTIRE GROUP IS CALLED THE POPULATION.

ALL THE ...

Because testing each member of a large group can be difficult or impossible, researchers often study a part of the population, called a **<u>sample</u>**.

- **<u>Population</u>**- Group about which info is gathered.

- **<u>Census</u>**: Collection of data from a whole population rather than just a sample.
  Example: surveying travel time by asking everyone at school is a **census** (of the school). ... but asking only the first 50 people you meet is a **sample**.

- **<u>Sample</u>**- When part of a population is chosen to get information about the whole population

- **<u>Survey</u>**: To gather information by individual *samples* so as to learn about the whole thing.

  Example: you could survey a river's water quality by taking a cupful of water from different locations at different times.

  Another example: you can do a survey on people's opinions, by asking randomly chosen people the same questions.

Characteristics:

- A **parameter** is a characteristic of a <u>population</u>.

  - For example, say you want to know the mean income of the subscribers to a particular magazine —a parameter of a population.

- A **statistic** is a characteristic of a <u>sample</u>.

  - You draw a random sample of 100 subscribers and determine that their mean income is $27,500 (a statistic).

Sampling Methods

Video

Types of Samples Review

- **Random sample**- Consists of individuals from the population chosen in such a way that every set of individuals has an equal chance to be part of the sample actually collected.

- This gives every member of the population an equal chance of being chosen.

- Ex:

Types of Samples

A biased sample does not fairly represent the population. A study of 50 elk belonging to a breeder could be biased because the breeder's elk might be less likely to have Mad Elk Disease than elk in the wild.
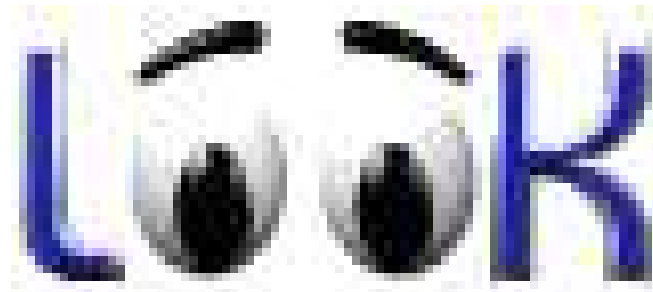
Types of Samples

- A **convenience sample** is based on members of the population that are readily available. (Just passing by)

- Would you survey teenagers about whether texting and driving should be legal???

Types of Samples

- **Voluntary response sample** consists of people who chose themselves. Often people that volunteer to respond to questions have strong opinions, often negative ones, that may not represent the population well.

- Ex: Surveying mall goers

Now- Let's look at some examples

Example 1

Determine which sampling method will better represent the entire population. Justify your answer.

Sampling method	Results
Emma surveys only the band students she knows personally.	84% want blue uniforms
Jared writes each band student's name on a card. She questions those students whose name she draws.	61% want blue uniforms

Example 2

Determine which sampling method will better represent the entire population. Justify your answer.

Sampling method	Results
Susan surveys every other swimmer on the team.	72% want practice early
Sydney questions the swimmers who are in his Biology class.	50% want practice early

Example 3

Gigi went to the food court in a mall to ask the people if they liked ice cream. She thought it would be a good location since food court has 3 different ice cream stores. She asked as many people as she could as they walked by her table. Is this sample biased? Why or why not?

Example

Determine whether each sample may be biased. Explain.

A. The mayor surveys 100 supporters at a rally about the most important issues to be addressed by the city council.

B. The principal sends out questionnaires to all of the students to find out what kind of music students prefer at dances.

Example

Determine whether each sample may be biased. Explain.

A. The owner of a record shop surveys only customers over the age of 18 who shop at his store.

B. The teacher writes the name of each student on a piece of paper and questions the students whose names are drawn.

Wrap up Video

- http://youtu.be/lnDPVBp-1_A

CW:

Is it Valid # 6 – 9

Questions:

6. What is the population of your survey?

- *The population is the entire set of items data was collected for*

- Population is the entire class ☺

7. Did your class perform a census or a survey?

- *Census-ask everyone Survey- Ask part*

- Census

8. How would you record your results from question 1 as a piece of data?

Answers will vary

9. How would you describe your results in question 2 as a parameter for the population?

A parameter means you describe a characteristic about the population based on your data.

Most seventh grade students carry a cell phone.

Is it Valid # 10 – 14

For each of the problems below, answer the questions in regard to population, samples, and surveys.

After the 2000 census, the United States Census Bureau reported that 7.4% of Georgia residents were between the ages of 10 and 14.

10. Was a parameter or a statistic reported? Explain your reasoning.

This is an example of a statistic since it includes actual data.

11. What is the population for this survey?

Every person in the United States

The manager of the Millcreek Mall wants to know the mean age of the people who shop at the mall and the stores in which they typically shop. He hires Barker Market Research Company to collect the data. Dennis works for the Barker Market Research Company and has been put in charge of collecting data for the Millcreek Mall. Dennis decides to interview 100 people one Saturday because it is the mall's busiest shopping day.

12. Is the survey a sample or a census? **It is a sample.**

13. What is the population for this survey?

The population is everyone who comes to the mall.

14. Is the sample size for the survey appropriate?

The sample size is too small for the population. The 100 people are not a representative sample of the entire population.

Populations and Samples Bingo