

# Day 1: Collecting Data

# 3 Ways to Collect Data!

How are we taking things in?

1. SURVEYS
  2. OBSERVATIONAL STUDIES
  3. EXPERIMENTS
-

# Surveys

## 1. Surveys!

- We usually use a questionnaire to measure the characteristics or attitudes of people.
  - Age, Gender, Ethnicity
  - How do you feel about the Royal Wedding?

# Observational Studies

## 2. Observational Studies

- Individuals are observed and outcomes are measured.
  - We just watch! We do nothing to try and affect what happens!

# Experiments

## 3. Experiments!

- Treatments are imposed to observe a response.
  - We are changing variables to see the effect! (Cause & Effect Relationship!)

## Observational Study or Experiment?

Fifty people with clinical depression were divided into two groups. Over a 6 month period, one group was given a traditional treatment for depression while the other group was given a new drug. The people were evaluated at the end of the period to determine whether their depression has improved.

## Observational Study or Experiment?

To determine whether or not apples really do keep the doctor away, forty patients at a doctor's office were asked to report how often they came to the doctor and the number of apples they had eaten recently.

## Observational Study or Experiment?

To determine whether music really helped students' scores on a test, a teacher who taught two U.S. History classes played classical music during testing for one class and played no music during testing for another class.



# Types of Sampling

Sample: A group that represents the population!!

1. SIMPLE RANDOM SAMPLE
  2. STRATIFIED RANDOM SAMPLE
  3. CLUSTER SAMPLE
  4. SYSTEMATIC RANDOM SAMPLE
  5. CONVENIENCE SAMPLE
  6. VOLUNTARY RESPONSE
-

# Simple Random Sample (SRS)

1. Simple Random Sample (SRS)
  - All individual in the population have the same probability of being selected.
    - Example: Pulling your number out of the cup!

# Stratified Random Sample

## 1. Stratified Random Sample

- Divide population into subgroups, or strata, and then randomly select subjects proportionally from the different strata.
  - Allows us to highlight groups.
    - Example: Freshman, Sophomores, Junior, Seniors. Each group is sampled.

# Cluster Sample

## 1. Cluster Sample

- Divide the population into groups and then a random sample of these clusters selected.
  - Example: Dividing into Freshman, Sophomore, Junior, Senior classes. BUT only sampling Freshman and Seniors.

# Systematic Random Sample

1. Systematic Random Sample
  - A researcher selects a number at random,  $n$ , and then selects every  $n$ th individual in the study.
    - Example: Picking every 5th person in line.

# Convenience Sample

## 1. Convenience Sample

- Taking a group that is easily accessible.
  - Example: Picking the first 100 people to enter school in the morning.

# Voluntary Response

## 1. Voluntary Response

- Subjects choose to take part in the sample.
  - Example: People who call in to give their opinions. OR polls that are online. THEY choose to take part in the process.

## Name that Sample!

A teacher asked the first 10 students to enter the classroom to their feeling towards which movies to play.

SIMPLE RANDOM SAMPLE

STRATIFIED RANDOM SAMPLE

CLUSTER SAMPLE

SYSTEMATIC RANDOM SAMPLE

CONVENIENCE SAMPLE

VOLUNTARY RESPONSE



## Name that Sample!

A principal gives a survey to all students of 15 randomly selected classes in the school.

SIMPLE RANDOM SAMPLE

STRATIFIED RANDOM SAMPLE

CLUSTER SAMPLE

SYSTEMATIC RANDOM SAMPLE

CONVENIENCE SAMPLE

VOLUNTARY RESPONSE

## Name that Sample!

Every 10th person to enter a concert is asked their favorite song.

SIMPLE RANDOM SAMPLE

STRATIFIED RANDOM SAMPLE

CLUSTER SAMPLE

SYSTEMATIC RANDOM SAMPLE

CONVENIENCE SAMPLE

VOLUNTARY RESPONSE

## Name that Sample!

A researcher randomly selects and interviews 10 math, 10 english, 10 science and 10 social study teachers.

SIMPLE RANDOM SAMPLE

STRATIFIED RANDOM SAMPLE

CLUSTER SAMPLE

SYSTEMATIC RANDOM SAMPLE

CONVENIENCE SAMPLE

VOLUNTARY RESPONSE

## Name that Sample!

The names of 30 students are put into a hat, it is then shaken and 3 names are picked to win tickets to a concert.

SIMPLE RANDOM SAMPLE

STRATIFIED RANDOM SAMPLE

CLUSTER SAMPLE

SYSTEMATIC RANDOM SAMPLE

CONVENIENCE SAMPLE

VOLUNTARY RESPONSE