* Population:

The population in a statistical study is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* Census: A census collects data from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Sample:

A sample is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the population from which we collect data

* Sampling method: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Good sample: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (to \_\_\_\_\_\_\_\_\_\_\_\_\_ the inference from the sample to the population)
* Bad sample (bias)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bias: Selecting individuals from the population who are easy to reach.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bias: Allowing people to choose to be in the sample by responding to a general invitation.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bias**:** Some groups in the population are left out.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bias**:** tendency to provide inaccurate or even false, answers to self-report questions
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bias**:** Data are not obtained from all individuals in the sample.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bias: when the wording of a question systematically influences the responses
* FRQ: “describe how the design of a sample survey leads to bias”

**Exam Tip:**

* Recognize the type of bias
* Describe how the members of the sample might respond differently from the rest of the population
* underestimate or overestimate the actual proportion/mean/…
* **Example:**

Explain how using your statistics class as a sample to estimate the proportion of all high school students who own a graphing calculator could result in bias.

* Sample without replacement:

Once an individual from the population is selected for inclusion in the sample, it \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A sample selected without replacement includes n \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ individuals from the population.

* Sample with replacement:

After an individual from the population is selected and the corresponding data are recorded, the individual is \_\_\_\_\_\_\_\_\_\_\_\_ in the population and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the sampling process.

A sample selected with replacement might include any particular individual from the population more than once.

* good methods of sampling
* Simple random sampling:

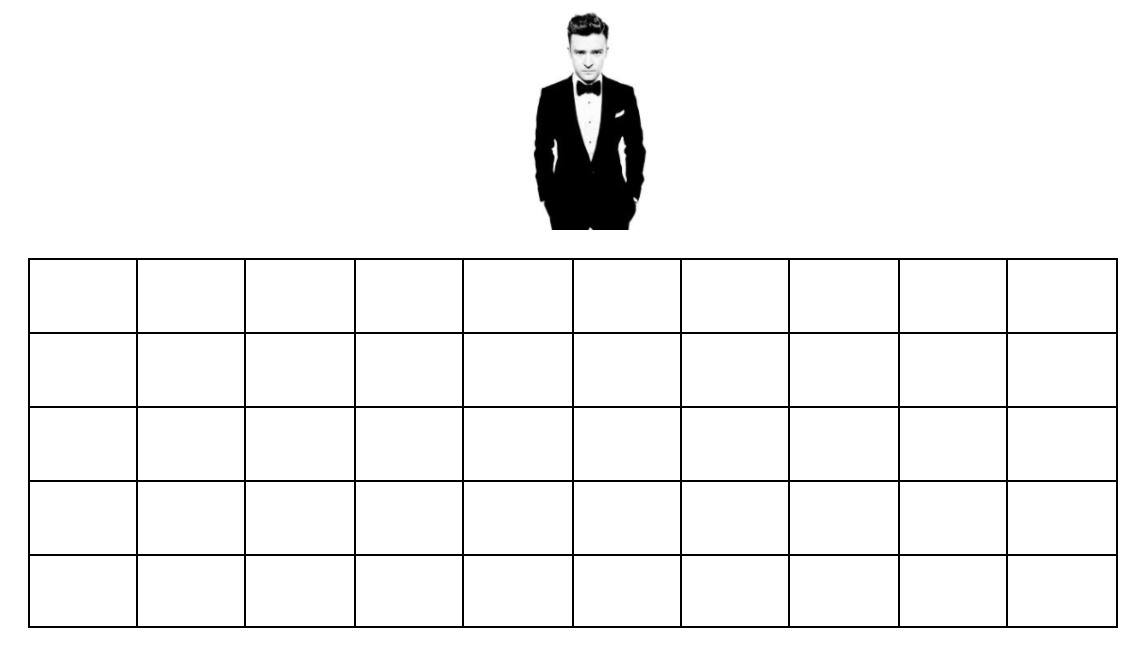
Ensure that every different possible sample of the desired size has the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**[FRQ]**

* **Label:** Give each member of the population a **\_\_\_\_\_\_\_\_\_\_\_** numerical label with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* **Randomize:**
* Read \_\_\_\_\_\_\_\_\_\_\_ groups of digits of the appropriate length \_\_\_\_\_\_\_\_\_\_\_\_\_\_ across a line in the table.
* \_\_\_\_\_\_\_\_\_\_\_\_ any group of digits that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the sample.
* \_\_\_\_\_\_\_\_\_ when you have chosen n different labels.
* **Select:** Choose the individuals that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**[Example] How Much Do Fans Love Justin Timberlake?**

JT’s concert promoter wants to find out how much fans enjoy the concerts. He will ask fans, “From 1 to 100, where 100 is the most, how much did you enjoy the concert?” The section he wants to survey has 50 seats (5 rows x 10 columns). The stage runs along the northern edge of the venue (where Justin is pictured). He wants to take a sample of 10 seats.

****

Q: Take a simple random sample (SRS) of 10 fans. Explain below the steps you used to obtain an SRS.

1. **Label**
2. **Randomize**
3. **Select**

* **Practice**
* Systematic sample
* Cluster sample
* Stratified random sample

