# SyModule 4- Sampling Guided Notes

Populations and Samples

Populations are what we want
Samples are necessary shortcuts

Population of interest:

Variable:

2 3 2 1 1 0 1 2 1 0 4 1

Population parameters:
Mean:

Standard deviation:

Sample statistics:
Mean:

Standard deviation:

Population of interest:

Variable:

Population parameters:
p=

Sample statistics:
p-hat=

**Review of symbols**

Simple Random Sampling

Billy, Jamie, Sue, Barnie, Jack, Mary, Andrew, John, Nitro, Christina, Jeremy, Meredith

How do we choose a sample fairly?

**SRS with a random number generator**

| | | | | |
|---|---|---|---|---|
| Billy | Jamie | Sue | Barnie | Jack |
| Mary | Andrew | John | Nina | |
| Christina | | | | |
| Jeremy | Meredith | | | |

What proportion of this population is male?

Samples of 4:

The SRS is brilliant because the results are **predictable**

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Stratified Random Sampling

The problem with the SRS in some populations

In a school of 580 students, I want to sample 40 students and want all grades approximately represented. How many should I ask in each grade?

| Grade | Frequency |
|---|---|
| 9th | |
| 10th | |
| 11th | |
| 12th | |

You know you need 8 ninth graders, but how do you choose them?

Step 1:

Step 2:

Step 3:

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Systematic Sampling

How would you collect a random sample of 50 people walking out of a grocery store next Tuesday afternoon?

Systematic sampling:

1. Estimate population size
2. Decide how many people you want to sample
3. Divide (1) by (2) to decide how often to stop
4. Start with a random individual

1.
2.
3.
4.

Thus we will sample person __, __, __...

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Cluster Sampling

1. Identify- equally sized groups (clusters)
2. Use SRS to choose entire cluster(s) for sample

**Problem**

Most of the time when we have a cluster, they are not well mixed

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Doing it Wrong

Just watch the video :)