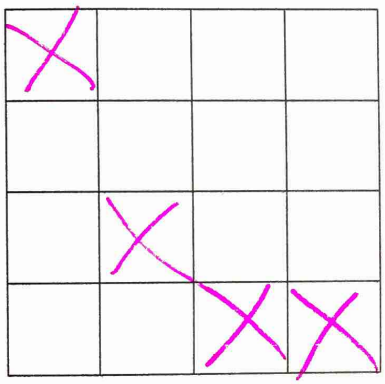
Name: _____ Hour: _____ Date: _____

Lesson 4.1: Day 2: How much do fans love Justin Timberlake?

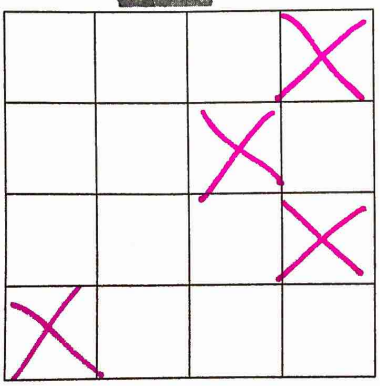
Justin Timberlake's concert promoter wants to find out how much fans enjoy his concerts. He wants to ask attenders, "From 1 to 10, where 10 is the most, how much did you enjoy the concert?" The area surveyed is square and divided into 16 equally sized sections (4 rows x 4 columns). The stage runs along the Northern edge of the venue (where Justin is pictured). We want to take a sample of 4 seats.

1. Using a random number generator, pick a simple random sample (SRS) of 4 seats. Place an X in the 4 seats that you choose.

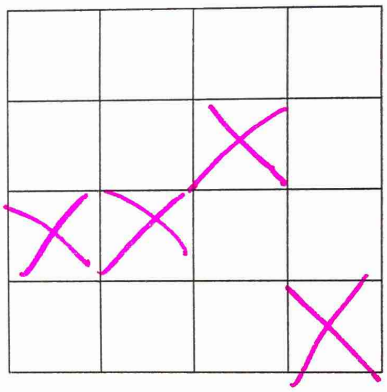


Answers will vary

2. Now, randomly choose one seat from each horizontal row. This is called a stratified random sample.



3. Finally, randomly choose one seat from each vertical column. This is also a stratified random sample.



4. Which method do you think will work the best? Explain.

The raws because the raw your seat is in affects how much you like the shaw.

Name: _____ Hour: _____ Date: _____

5. Now, it's time for the actual data. The numbers below are the average enjoyment for each of the 16 sections. For each of your three samples above, calculate the average enjoyment. Add your average to the dotplots on the board.

9.5	9.8	9.7	9.4
8.1	8.3	8.2	8.3
6.8	7.1	6.9	7.0
5.1	5.8	5.7	5.4

Answers will vary

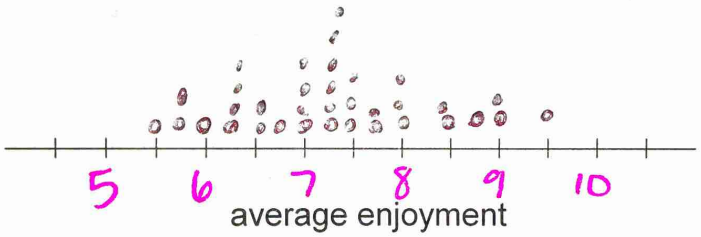
Sample #1: $\frac{+ \quad + \quad + \quad +}{4} = \bar{x}$

Sample #2: $\frac{+ \quad + \quad + \quad +}{4} = \bar{x}$

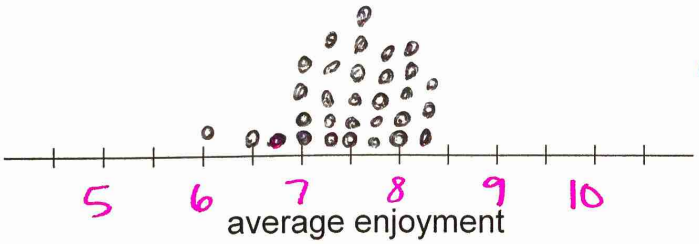
Sample #3: $\frac{+ \quad + \quad + \quad +}{4} = \bar{x}$

Graphing the results:

Simple Random Sample:

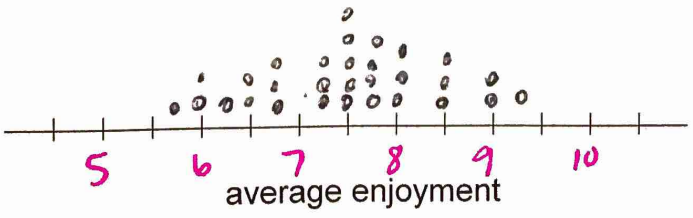


Stratified by Row:



Least variability

Stratified by Column:



choose strata based on characteristics that may affect responses. & least variable.

6. Which method was best? Why?

Rows, it was the least variable. How affects enjoyment.

Name: _____ Hour: _____ Date: _____

Lesson 4.1: Day 2: Other Random Sampling Methods

Big Ideas:

- Stratified Random sample: splits population into groups (strata) and chooses an SRS from each group.
- Cluster sampling: split population into groups based on location (clusters) and randomly select clusters. Talk to everyone in cluster.

Simple Random Sample: choosing a group from the population so that every individual and group of individuals has an equal chance of being chosen.
Steps for SRS: ① Label ② Randomize ③ Select.

Check Your Understanding:

A factory runs 24 hours a day, producing wood pencils on three 8-hour shifts— day, evening, and overnight. In the last stage of manufacturing, the pencils are packaged in boxes of 10 pencils each. Each day a sample of 300 pencils is selected and inspected for quality.

1. Describe how to select a stratified random sample of 300 pencils. Explain your choice of strata.

   For each shift (Day, evening, overnight) choose 100 pencils. ① Label all pencils, 1 to N ② Randomly choose 100 pencils ③ Check the 100 pencils.

2. Describe how to select a cluster sample of 300 pencils. Explain your choice of clusters.

   Boxes are the clusters ① Label every box, 1 to ... N, ② Randomly choose 30 boxes. ③ Check all pencils in 30 boxes.

3. Explain a benefit of using a stratified random sample and a benefit of using a cluster random sample in this context.

- Stratified: We get 100 from every shift so we get a more precise estimate.
- Cluster: simplifies process. We don't have to label every pencil, just every box.