

DIRECTIONS: For each situation below, determine what type of sampling technique is used (Simple Random Sampling, Stratified Random Sampling, Systematic Sampling, Cluster Sampling, or Convenience Sampling). Each scenario will only use one sampling method.

- Strat. 1. To get a sense of election outcomes, a political group chooses ten precincts to conduct a survey of voters in those areas.
- Cluster 2. A company is taking a survey of its employees and separates them into the following groups: Male/Part-Time, Male/Full-Time, Female/Part-Time, Female/Full-Time.
- Syst. 3. A researcher wants to sample eight houses from a street of 120 houses. Every 15th house is beginning with house #11. The houses selected are 11, 26, 41, 56, 71, 86, 101, and 116.
- Conv. 4. A group of students in a high school do a study about teacher attitudes. They interview teachers at the school.
- Simp. Ran 5. A researcher wants to select ten students for a survey. Each student's name is placed in a hat and 10 names are selected.
- Cluster 6. A researcher wants to sample eight houses from a street of 120 houses. Every 15th house is beginning with house #11. The houses selected are 11, 26, 41, 56, 71, 86, 101, and 116.
- Conv. 7. The researcher stands at a shopping mall and selects the first 75 shoppers as they walk by to fill out a survey.
- Strat. 8. To determine the average milk yield of each cow type in his herd, a farmer divides his herd into four sub-groups and takes samples from each group.
- Simp. Ran 9. All senior's names are placed into a fishbowl and 5 names are drawn to complete a college survey.
- Strat. 10. A researcher selects 15 households from each zip code in the Houston area.

11. Know the definitions and uses for the vocab terms above AND the following words:

Experimental
Observational
Statistic
Histogram
Census
Population

Blind/Double Blind
Frequency
Sample
Treatment Group
Placebo Effect
Simulation

Control Group
Parameter
Null/Alternative
Hypothesis

12. Write the Null & Alternative Hypothesis for the given situation:

"A doctor's office claims that the wait time is 15 minutes or less"

Null: $H_0: \mu \leq 15$ minutes

Alternative: $H_a: \mu > 15$ minutes

13. Mrs. Knox's English classes were working on their term themes. During 2nd period, she allowed students to listen to their choice of music through earbuds while working, but her 4th period class was required to work quietly without music. Mrs. Knox averaged this major grade for each class and compared 2nd period's average to 4th period's average.

- Is this an experimental or observational study? How do you know?

experimental - groups were made and treatment given

- What is the variable of interest?

Term theme taken as major grade

- What is the treatment?

Listening to music

- Which Group is considered the "control group"? How do you know?

4th period - no music

14. What is the formula for finding margin of error? And for finding your sample size?

$$M.O.E. = \frac{1}{\sqrt{n}}$$

$$n = \frac{1}{\text{decimal}^2}$$

15. What is the margin of error for a sample size of 1000 people?

$$\pm 3.2\%$$

16. Given the margin of error, $\pm 4.7\%$, find the sample size.

452 people

17. Given that a survey had a "yes" range of 53.2 – 65.4%, how many people were surveyed?

$$M.O.E. = \pm 6.1\%$$

$$n = 268 \text{ people}$$

18. Find the margin of error for a survey with a sample size of 6,847 people and a 78% "yes" rate.

$$m.o.e = \frac{1}{\sqrt{6847}} = \pm 1.2\%$$

$$\boxed{76.8 - 79.2\%}$$

19. If you increase your sample size, what kind of effect is there on your margin of error?

Decrease in Margin of Error

20. Politician Paul and Candidate Carl are running for Governor. The latest surveys show that Politician Paul has 46% of the vote, while Candidate Carl has 43% of the vote. The news report, however, states that this survey has a 10% margin of error.

- What interval describes each potential governor's chances of winning the election and what do they mean for each of them?

Paul: 36-56%

Carl: 33-53%

Both go above 50%, so both have a chance to win

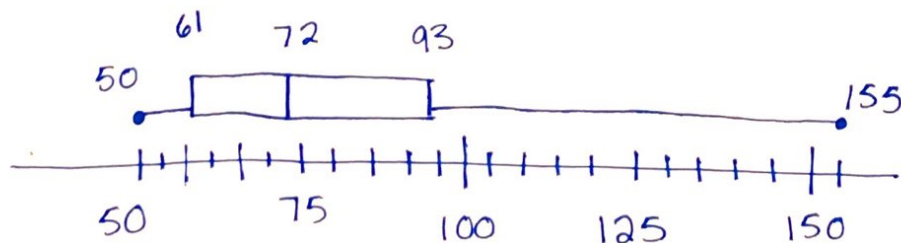
21. The number of calls received by a Healthcare Hotline during 17 randomly selected days are listed below:

50, 57, 77, 66, 53, 72, 51, 88, 82, 70, 112, 107, 69, 88, 98, 65, 155

a) Find the following pertaining to the data:

- Minimum: 50
- Q1: 61
- Median: 72
- Q3: 93
- Maximum: 155

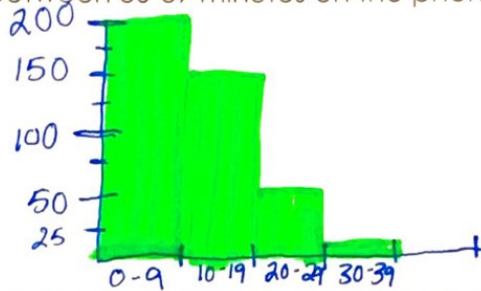
b) Create a Box-and-Whisker plot pertaining to the scenario:



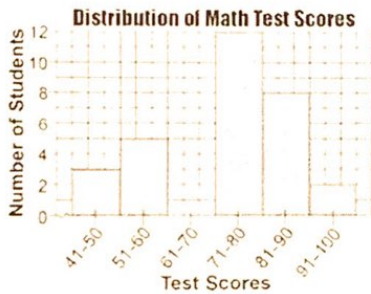
22. Create a histogram for the following scenario:

Jonathan was conducting a survey in which he asked people how much time they spent talking on the phone each month. He found that 200 people spent between 0-9 minutes, 150 people spent between 10-19 minutes, 50 people spent between 20-29 minutes, and 10 people spent between 30-39 minutes on the phone.

minutes	Freq.
0-9	200
10-19	150
20-29	50
30-39	10



23. Given the following histogram, complete the following frequency table:



Test Scores	Frequency	Cumulative Frequency
91-100	2	2
81-90	8	10
71-80	12	22
61-70	0	22
51-60	5	27
41-50	3	30