**Statistical Survey Project**

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_

**The project will be due \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Overview**

You will be designing and conducting your own survey to draw an inference about a certain population. You will need to display the data collected in 3 different ways, and will be presenting your data and results of your study to your class.

If you follow these steps, you will do well on this project!

**Step 1**

Choose two ***quantitative*** survey questions and write them down here. A ***quantitative*** survey question is a question with a numerical value. For example, “How often do you pack your lunch during a school week?”. Do not use a survey question such as “What is your favorite subject?”

My two possible questions are:

1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 2**

Meet with your teacher to discuss your two questions, and which would be the better choice to yield valid results. Highlight the question that you and your teacher decide that you will be using.

**Step 3**

You will need to survey two different groups, for comparison. For example, you could sample boys vs. girls; students at your school vs. adults at your school; people who shop at a certain store vs. another store.

Describe your two comparison groups (sample populations), and how they will meet the needs of your survey.

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Prediction: What do you predict the results will be?

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**Step 4**

Conduct your survey!!! Your sample size for each population must be at least 60. The greater the sample the better the results will be! Record your samples in the table below. Group 1 will be recorded on this page, Group 2 will be recorded on the following page.

Question: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Group 1 - Sample Population: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Question: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Group 2 - Sample Population: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Step 5**

Create a frequency table for your two data sets. An example is shown below.

Frequency Table for Population 1

|  |  |
| --- | --- |
| Peas in a Pod | Frequency (how many times it occurred) |
| 3 peas | 5 |
| 4 peas | 10 |
| 5 peas | 28 |
| 6 peas | 36 |
| 7 peas | 12 |
| 8 peas | 9 |
|  | Total = 100 |

Frequency Table for Population 2

**Step 6**

Create ONE dot plot for both populations. Use two different colors and be sure to indicate which color represents which population. Be sure to title your dot plot.

Population 1 Color \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Population 2 Color \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 7**

Create a 5-number summary and find the range and IQR for both populations.

|  |  |
| --- | --- |
| Population 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Population 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Mean (review) =  Median =  Q1 =  Q2 =  Q3 =  IQR =  Range =  Maximum Value =  Minimum Value = | Mean (review) =  Median =  Q1 =  Q2 =  Q3 =  IQR =  Range =  Maximum Value =  Minimum Value = |

**Step 8**

Find the mean for each population and then create a number line for each population and find the ***mean absolute deviation*** (MAD).

Population 1: Mean \_\_\_\_\_\_\_\_\_\_\_\_\_; MAD \_\_\_\_\_\_\_\_\_\_\_

Population 2: Mean \_\_\_\_\_\_\_\_\_\_\_\_\_\_; MAD \_\_\_\_\_\_\_\_\_\_\_

**Step 9**

Construct a box-and-whisker plot for both of your populations.

Population 1

Population 2

**Step 10**

You will now need to assemble all of your graphical displays and data to present to the class. You may choose to make a poster, a prezi or a powerpoint presentation, or some other type of display to present your graphical data and conclusions. You may hand draw your graphs, as you did on the prior pages, or you may use software to help you, such as excel, or <http://illuminations.nctm.org/ActivityDetail.aspx?ID=77> for dot plots.

**Step 11**

Answer the following questions about your survey in the form of a report. It may be typed or neatly handwritten.

Introduction

1. Describe the question you are studying.
2. What assumption(s) made you believe your chose subgroup (e.g. boys v. girls) would yield more interesting results. Explain.

Analysis

1. What are the results of your study?
2. Do you believe your findings are statistically valid? Why or why not?
3. What possible factors may have contributed to your results? (E.g. was one population biased?)

Graphical Analysis

1. Of the 3 displays, frequency tables, dot plot, box-and-whisker plots, which display best illustrates the similarities or differences between your two subgroups? Explain.
2. Of the 3 displays, frequency tables, dot plot, box-and-whisker plots, which display is the worst at illustrating the similarities or differences between your two subgroups? Explain.
3. For each population, is your dot plot skewed to the left, right, or neither? What does this tell you about the data?
4. For both populations, is your box and whisker plot skewed to the left, right, or neither? What does this tell you about the data?
5. For the box and whisker plot, which population had the greatest variability? What does this tell you about the population?
6. Does your data have any outliers? If so, how did the outlier change your results?

Conclusion

* Write a one-paragraph summary about what you learned about the two populations you surveyed, and what inferences can be made.
* Were you surprised by your findings or did your study confirm your previous prediction. Explain.
* What did you learn mathematically and/or technologically from conducting this study?
* Any final thoughts.

**Statistical Survey Project – Rubric**

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| --- | --- | --- |
| **Components of the Project** | **Points Possible** | **Points Earned** |
| Pre-Planning & Survey |  |  |
| Step 1 & 2: Question Approved by Teacher | 5 pts. |  |
| Step 3: Comparison Groups & Prediction | 5 pts. |  |
| Step 4: Survey of Two Sample Populations | 10 pts. |  |
| Graphical Displays |  |  |
| Step 5: Frequency Tables | 10 pts. (5 points each) |  |
| Step 6: Dot Plot | 10 pts. (5 points each) |  |
| Step 7, 8 & 9: Analyzing Data, MAD, Box-and-Whisker Plots | 30 pts. |  |
| Presentation |  |  |
| All graphical displays are presented; student is able to clearly describe their survey question, sample population and results. | 20 pts. |  |
| Written Analysis |  |  |
| Introduction | 5 pts. |  |
| Analysis | 10 pts. |  |
| Graphical Analysis | 10 pts. |  |
| Conclusion | 5 pts. |  |
|  |  |  |
| Total Points: | 120 Points |  |