***Group Statistics Project***

*Work in groups of 2-4.*

**Intro: Surveys, Experiments, and Inference**

This project is meant to be a very brief and simple version of what type of product can be produced from the findings of a survey (or of an experiment if you decide on option 2). When publishing a paper (or writing a thesis) for instance, this is the type of work that is done, but on a much larger scale and with much more depth of background research. If you choose option 2, you will design an experiment and determine if changing one variable impacts something else (see option 2 below).

**OPTION 1: SURVEY**

Choose 3-5 questions to ask Moses Brown students or staff (or you may also decide on survey questions for Providence residents or something of that sort.) Ideally these questions should be about a topic that you are actually interested in learning about your peers/society (remember that surveys take time and you can potentially find out valuable and interesting information about the surrounding world). Remember that who you survey determines who you can speak about regarding the results of your study (i.e. if you only survey HS juniors, then you can only really make a statement about HS juniors). Think about who you want your results to speak about.

These questions could be quantitative (such as homework minutes per night, number of hours of sleep etc.) or could be questions where you will use proportions (i.e. what proportion of students say math is their favorite subject).

Ideally, your questions could focus on a common theme.

Your survey should be given to at least 25 participants, but you may of course survey more people if you feel the need. You may also include additional basic questions about gender, grade, etc. but these don’t count as the 3-5 questions but will allow you to say more about the group that you surveyed.

**Option 2: Design an Experiment**

Design an experiment. This can be a lot of fun by the way, but can potentially take more work depending on your project’s design.

For the sake of our study, if your p-value is below 5% than we will consider it statistically significant. Remember that you can do this on your calculator (with a 2 Samp T-Test or 2 Prop Z-Test)

Remember my example: Do students complete math problems quicker while Mozart is playing versus while techno is playing?

Create a control group and an experimental group. Make sure you RANDOMLY assign participants to groups (i.e. picking names out of a hat or using the random integer generator on your calculator. Make sure that all other factors are controlled for.

Come check with me about your experiment’s design if you have questions. The key to a good experiment is to change one variable and keep everything else about the experiment the same (i.e. same room that students answer the question in, same directions, etc. the only difference is that music is playing in one room and not in another in my example.)

**Writing a brief report on your findings.**

**Title/Authors:** Choose an appropriate title and include the authors.

**Introduction/Hypothesis:** Briefly describe what you decided to ask in your surveys (or if you chose option 2, a brief description of your experimental question) and why you believe that it is an important topic. Also, state your hypotheses (what do you expect to find). It is important to come up with your hypotheses before you conduct the study. Your intro is a place to elaborate on why your topic might be of interest to your reader. Hook the reader!!

**Method:** Describe who you surveyed (be specific i.e. Moses Brown High School students for example), how you selected your participants (simple random sample, convenience sample, etc.), how many participants were surveyed. (Note: if you choose option 2, describe in detail the experiment design. Be precise in your method. Someone should be able to replicate your study by reading the description. Be Specific!!

**Results** (Visual Display of Data): Describe the results of your study including a 95% confidence interval for each of your results (only if you do option 1). You may also want to include a visual display of all or some of your results (bar graph, circle graph, etc).

For option 2, include the p-value against the level of significance (let’s use 0.05). Also display a graph of your results.

**Conclusion:** What did you learn from your study? Did your results support your hypothesis? What further questions would you like to ask in a future study? Were there any problems with your methodology that might have influenced the results?

**What to Hand In**

1. Your final product should be typed (12 font, double spaced) and handed in and include all information above.
2. Please also hand in the survey that you gave to participants in your study as a separate document (this can be an appendix at the end of your paper which you can refer to if needed in the paper).
3. Finally, also include the RAW data of the surveys that you tallied (i.e. make an excel sheet of the raw data that you collected). For example you could make a column stating the number hours of sleep that each participant responded. Make this an appendix as well.

*NOTE: Your paper should only be 1-2 pages long of writing and then some graphs, appendixes, etc.. Remember, this is just a brief assignment and you can think of it as a preliminary study that if the results were interesting/valid could lead to further research. Be sure to print and edit your paper to check for mistakes!*

|  |  |
| --- | --- |
| ***Completion***  *All Aspects of the project are included (Title/Authors, Intro/Hypotheses, Method, Results/Visual Display, Conclusion, Survey/Data (attached)).* | *\_\_\_\_\_\_\_\_\_*  *10* |
| ***Writing***  *The paper is clear, concise, and easy to understand. A reader could easily decipher the method and results and conclusions from this study. The paper is free of grammatical mistakes and sentence structure is sound. The writer is clearly interested in the topic at hand and the writing is scientific and formal.* | *\_\_\_\_\_\_\_\_\_*  *75* |
| ***Formatting/Presentation of Results***  *The paper is properly formatted and easy to follow. Subheadings for each section are included. Visual displays are easy to follow.* | *\_\_\_\_\_\_\_\_\_*  *5* |
| ***Creativity/***  *The project is meaningful and interesting. The researchers were engaged in their topic and also engage the readers in their findings.* | *\_\_\_\_\_\_\_\_\_*  *10* |

**Project 1 Evaluation: Survey/Experiment Project**

Names:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Additional Comments\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**FINAL GRADE:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**