Objective: Conduct an experiment and analyze the data by using the inference techniques that we have learned this semester. Pick a topic that you and your partner can have fun with – just make sure that it is *appropriate* fun.

Here's what you need to do:

1. ### Find a partner and a topic of interest.
    a. Explore a subject in which **you have an interest**.
    b. Decide on a **question** related to your topic of interest.
    c. You must collect data (survey/experiment) and **perform a hypothesis test/confidence interval** to assist you in answering your question.

2. ### Write a proposal (so that I can approve of your project)
    a. What is the question that you are asking?
    b. What type of data will you collect (categorical/quantitative) and *exactly* how will you collect it? **Details are very important!!!**
    c. How are you incorporating **randomness** in collecting your data? Are you conducting a random sample? Randomly assigning volunteers to treatments? Will you be able to show causation? Who can you generalize the results to?
    d. What graph(s) and inference procedure (hypothesis test/confidence interval) do you plan to use?
    e. **E-mail your proposal to brianyoun@gmail.com, and put "AP Stat" somewhere in the subject header.** Make sure each partner has a copy of the proposal!

3. ### Conduct your survey / experiment! Collect data!
    a. This may be done outside of class.
    b. Be sure to use randomization properly.
    c. Record your data carefully!
    d. **Both partners should have a copy of all data at all times!!!**

4. ### Create graphs & plots & tables, etc.
    a. Use a computer (Fathom!) or a calculator.
    b. Possibilities: dot plot, histogram, box plot, scatterplot, bar graph
    c. Find the mean, standard deviation, and 5-number summary for your data *if appropriate*.
    d. **Copy all of your plots into your Word document.** Submit via e-mail to brianyoun@gmail.com, and put "AP Stat" somewhere in the subject header

5. ### Conduct a **hypothesis test** and **confidence interval.**
    a. Be sure to include *all the appropriate parts*. Anything that I would expect to see on a test problem (conditions, formulas, definitions, conclusions, etc) should be clearly shown!

6. ### Write a paper! (see guidelines on the next page)
    a. Your final report is to be typed in Word (equations may be printed very neatly).
    b. You may use words to describe symbols (x-bar, mu, alpha, etc).
    c. Your writing should be beautiful and flow like water from a fountain ☺
    d. **E-mail your final paper to brianyoun@gmail.com, and put "AP Stat" somewhere in the subject header.**

7. ### Prepare a well-planned *short* oral report.
    a. **Time limit:** 2 minutes
    b. Ideas: create a power point, use drama, YouTube.
    c. Be creative, informative, and entertaining!

Guidelines to help your paper flow like a beautiful novel ☺

- a **title page**: title, name(s), period, date

- an **introduction** stating your subject, describing your interest in that subject, and the _question_ you are asking about your subject

- a **copy of your original data** _clearly stating and describing the <u>the method you used to gather the data</u>_

- You must explain how your method incorporated the **principals of experimental design**.

- all **graphs, plots, statistics** within your narrative

- your complete **hypothesis test** and **confidence interval** _(if appropriate)_

- a **summary** of your findings. **Answer your original question making <u>references</u> to what you found in your graphs, plots, statistics, hypothesis test and confidence interval. To whom can you generalize your findings?**

- **Reflect on your study and report**. What problems did you encounter? What might you have done to make the experiment better? Did any lurking variables surface while you were working?

This project will broken up as two or more **test grade(s)** for the 6th Six Weeks.

Due Dates:

Friday, April 10	Detailed description of (1) topic of interest and (2) implementation plan (project must receive approval) _(e-mail to brianyoun@gmail.com, please put "AP Stat" somewhere in the subject header)_
??? (Date TBD)	Data and Graphs due _(e-mail to brianyoun@gmail.com, please put "AP Stat" somewhere in the subject header)_
Friday, May 22	Project due _(e-mail to brianyoun@gmail.com, please put "AP Stat" somewhere in the subject header)_

Final Project due: 4:59 P.M., FRIDAY, May 22

Late????? Gasp!!!!

If the project is turned in **late**, 10 points will be deducted for each school day.
For example, if the project is due on Tuesday and you turn it in on Thursday, then 20 points will be deducted from your grade before grading begins.

Group Member Names:

_____

Experimental Design Project Rubric

	Exceptional, well written. Thorough and detailed explanations	Adequate, possibly a few minor errors.	Weak, more detail necessary, and/or several errors	Missing	Total
Question stated in intro stating your subject, with description of interest in question	10	6	2	0	
Clear description of method used to gather data. How did you incorporate principals of experimental design?	10	6	2	0	
Graphs, plots, statistics included in within narrative	15	8	3	0	
Hypotheses being tested. Define any symbols used.	5	3	1	0	
Conditions for inference	5	3	1	0	
Calculation of test statistic and p-value, showing all formulas and steps	5	3	1	0	
Conclusion for inference test	5	3	1	0	
Confidence interval and interpretation	5	3	1	0	
Summary of your findings. Answer your question making references to what you found in your graphs, plots, statistics, inference tests, confidence int.	15	8	3	0	
Reflection on your experiment and report. What problems did you encounter? What improvements might you have made?	10	6	2	0	
Title Page	4	2	1	0	
Due Dates met	6	3	1	0	
Partner Contribution	5	■■■■	■■■■	0	

Comments:

Final Score: