Final Project

AP Statistics

AP Statistics has introduced you to the methods and procedures that allow us to explore four themes: Producing Data, Exploring Data, Anticipating Patterns, and Statistical Inference. This Final Project is designed to allow you to demonstrate your understanding of the connections between these themes as you carry out a statistical study. Your task is to identify a research question that interests you, design a study to collect data on that question, analyze the data, and answer the question using an appropriate form of inference.

Project Outline:

- Identify a Research Question

- Collect Data – Observational Study or Experiment

- Analyze Data – Graphically and Numerically

- Perform Inference – Answer Research Question

- Present Findings

Description/Overview:

The project is a cumulative one, and will use much of what you have learned in this class.

- The project will be done individually or a team of two. **(NO EXCEPTIONS)**
- Each team will explore a research topic of interest and perform an experiment or observational study and confidence interval and/or significance testing related to that topic.
- The team will record numerous variables during the study or experiment and then analyze the results using the techniques learned in class.
- The team will then create a presentation summarizing the results ***and*** create a portfolio/written report (Arial or Times Roman, font size 12, 1.5 space, 1" margin)
- Finally, ***all*** members of the team will present the project to the class.

Technology Requirements:

There will be an emphasis on the use of technology for this project. You will be graded on your ability to effectively use technology in conducting your research, analysis, and presentation of findings.

- The Internet can be a primary source for your research.
- Microsoft Excel or any graphing utility will be used for data analysis, charts, tests, confidence intervals, and graphs.
- A Microsoft PowerPoint slideshow (or something comparable) must accompany the oral presentation.
- Microsoft Word will be used for any written components.

Completing the Project:

- First, choose a topic that you want to research.
- Decide what variables you want to record, and how you will record them.
- Decide on how you will collect your data (either by performing an experiment or doing an observational study), and decide on what tests and intervals you'll use.
- **GET YOUR IDEA AND YOUR TESTS/INTERVALS APPROVED BY MR. B before you proceed!!!**
- Write a brief proposal of your project (TYPED) which includes:
    - Topic
    - How you plan to gather your data
    - What tests of significance/confidence intervals will be used
    - What exploratory data analysis will be used
    - Sources of error/bias
- Collect your data! Then use Microsoft Excel or any graphing utility to compile your results.
- Perform **both exploratory data analysis and inference** on your data.
    - Exploratory data analysis includes Ch. 2-17 of our curriculum (visual and numerical statistics and summaries, ***with conclusions about the population***).
    - There must be *at least* 1 graph for each test of significance/confidence interval
    - Inferential analysis includes Ch. 19 -27 of our curriculum
    - For Inference, you must have a ***minimum*** of 2 different tests of significance and matching confidence intervals ***OR*** 3 tests of significance.
- Create a power point presentation that discusses/shows ALL of your analysis and your results. See the next section or the grading rubric for details.
- Create a portfolio/written report to turn in (see grading rubric for specifics)

Check in:

FROM TIME TO TIME WE WILL CHECK IN TOGETHER TO MAKE SURE YOU ARE PROGRESSING ON YOUR PROJECT. IF YOUR CLASS TIME HAS NOT BEEN USED PRODUCTIVELY AND/ OR YOU ARE NOR PROGRESSING ON YOUR PROJECT, IT WILL HAVE AN EFFECT ON YOUR GRADE.

Requirements of the Presentation:

At the conclusion of the research, each team will present their research to the class. The presentation must be supported with an interactive PowerPoint slide show (or something comparable). The presentation must **last a minimum of 10 minutes but no more than 15 minutes**, structured as follows:

1. An introduction *(including background information on your topic)*
2. Summary of Topic and Data collection *(**what** you wanted to analyze and **how** you collected your data)*
3. Discussion and Summary of Data analysis *(**both** exploratory **and** inferential analysis)*
4. Overall conclusions *(broadened to the population, with your own opinions, from the data)*
5. Application to the population *(how do your results and conclusions apply to your population)*
6. Bias/Error in your methods and your personal opinions on the research/analysis/results

Please see the grading rubric for more details. Each team member should lead part of the presentation. You will also be answering questions from your classmates and the teacher at the end.

The presentation schedule will be determined *randomly* on that day, so you must be ready even if you don't get called that day. I will accept volunteers that would like to present first.

Grading:

- The project is worth 200 points- see rubric for exact values

NOTES:

- Surveys of the school: You are NOT allowed to take an SRS of the student body, and voluntary response samples are not sound methods of data collection. Data collection must be done in another way.
- If you do any χ^2 test, you NEED to include a table with your observed data in your power point. Also, you need to include a table with your expected data.
- Summary tables from Microsoft Excel should NOT be copied & pasted into the power point.
- Test/Interval boxes from graphing utility should NOT be copied & pasted into the power point.
- 2-way tables (without row/column proportions) and graphs are allowed to be copied & pasted in.
- Be careful not to put too much information on each slide. Split up graphs, charts, etc. so it is easy to understand your analysis.
- Be sure to DESCRIBE and ANALYZE all graphs.

AP STATISTICS: FINAL PROJECT

"IT'S WHAT YOU LEARN AFTER YOU KNOW IT ALL COUNTS."
~ HARRY S. TRUMAN

Project Calendar				
Date		**Project Task**	**Assignment**	**RNB Sign**
Mon	5/12	Project Instructions/ Planning/ Questionnaire/Survey Request Letter	Determine Partner/ Determine Research Question/ Planning	
Wed	5/14	Begin Research	**Research Question/Plan Due**	
Thu	5/15	Experiment/Observational Study	Collect Data	
Mon	5/19	Experiment/Observational Study	Collect Data	
Wed	5/21	Experiment/Observational Study	**Raw Data Due**	
Thu	5/22	Analyze Data	Graphical/Numerical Analysis	
Mon	5/27	Analyze Data/ Answer Research Question	**Graphical/Numerical Analysis Due**	
Wed	5/28	Answer Research Question	**Inference Procedure Due**	
Thu	5/29	Write Up Findings/Write Final Report	Begin Final Report/Write Final Report	
Mon	6/2	Finish Report	**Final Printout Report Due**	
Wed	6/4	**Presentations**		
Thu	6/5	**Presentations**		

Note:

The purpose of this project is to allow you to communicate your understanding of the connections between the four themes of Statistics.

Your final report should clearly indicate your understanding of data collection, analysis, and inference. Printed report is due on **6/2**. **Late reports will be deducted 20 points/day late.**

Presentation should be 10-15 minutes and should incorporate visuals (Powerpoint, video, etc). You should know your report by heart. If you were just reading the content of the slides, you will be deducted at least10 points.

Timeline:

You will have time in class to complete the project. Use this time wisely. You may need to work outside of class as well.

- ☑ 5/14: Partner and Research Question
- ☑ 5/21: Raw Data
- ☑ 5/27: Exploratory Data Analysis
- ☑ 5/28: Inference
- ☑ 6/2: Final Printout Report
- ☑ 6/4-5: Presentations

GRADING RUBRIC

COMPONENT	PTS. POSSIBLE	PTS. DEDUCTED
(1) Proimposal (on time and complete, see guidelines)	10	_____

(2) Portfolio/Written Report

a. Title page	2	_____
b. Copy of Proposal	1	_____
c. Sources of Research/Procedure of Data Collection	5	_____
d. Data (printed out from Excel or typewritten)	5	_____
e. Written summary of Findings	20	_____
(summaries of exploratory and inferential analysis, with intro and conclusion and bias/error)		
f. Printed slides from presentation (6 per page)	2	_____

(3) Presentation

a. Length (minimum 10 minutes)	5	_____
b. Description of topic (what you wanted to research)	5	_____
c. Procedure (of data collection and analysis)	5	_____
d. Background on topic	5	_____
e. Exploratory Data Analysis		
i. Visual and Numerical Statistics (on all your variables)	15	_____
ii. Analysis (of above)	10	_____
iii. Conclusions (about population)	5	_____
f. Inferential Analysis of Data (2 tests & 2 intervals **or** 3 tests)		
i. Conditions (stated and checked thoroughly)	15	_____
ii. Hypotheses	5	_____
iii. Mechanics (for tests and intervals)	20	_____
iv. Conclusions	10	_____
g. Application (of your findings to population)	10	_____
h. Bias/Error	10	_____
i. Personal Opinions/Conclusions	10	_____
j. Q & A (from classmates)	5	_____
k. Days Late (_____ number of days late) - 20 (each day)		_____
(a fraction of a day is rounded to one day)		

(4) Individual

a. Use of class time (socializing affects your grade)	10	_____
b. Contributions to the research/presentation	10	_____

| **TOTAL:** | **200** | _____ |

TEAM: _____   **FINAL GRADE:** _____

PROJECT TITLE: _____