

### Inference Project

1. Write a proposal describing the design of your study. In your proposal, make sure to:
  - Describe the statistical question you are trying to answer.
  - State the null and alternative hypotheses you will be testing, along with the name of the significance test you will use to analyze the results. Be sure to define the parameter(s) of interest.
  - Describe how you will collect the data so the conditions for inference will be met.
  - Explain how you will conduct the study in a safe and ethical manner.
2. Once your teacher has approved your proposal, carry out the study.
3. Create a poster to summarize your project. Make sure to include the following:
  - *Title.* Write the title in the form of a question.
  - *Introduction.* The introduction should discuss what question you are trying to answer, why you chose this question, and what your hypotheses are.
  - *Data Collection.* In this section, you will describe how you obtained your data. Be specific.
  - *Graphs and Summary Statistics, Including Raw Data.* Begin by providing the raw data. If the data are quantitative, list them in a table. If the data are categorical, summarize them in a two-way table. Then make graphs that are well labeled and list appropriate summary statistics. Use the graphs and summary statistics to describe the evidence for the alternative hypothesis.
  - *Analysis and Conclusion.* Identify the inference procedure you used and discuss the conditions for inference. Give the standardized test statistic and  $P$ -value (with interpretation), along with the appropriate conclusion. Then provide the corresponding confidence interval (with interpretation).
  - *Reflections.* In this section, you should discuss any possible errors (e.g., Type I or Type II), limitations to your conclusion, what you could do to improve the study, and any other critical reflections.

**DUE DATES:** Proposal: \_\_\_\_\_

Poster/Presentation: \_\_\_\_\_