The following titles and subtitles should be used for your lab report and given in this order with your lab report:

* **Personal Engagement**
  1. In a statement, discuss why you chose this idea. You are justifying the purpose behind your study.
  2. The quality and time put into your paper will provide evidence of your engagement through your process and the product produced
* **Exploration** 
  1. **Investigation Topic**
     1. Focused and not vague in any way.
  2. **Background Information**
     1. In paragraph form, provide research behind choosing your question (or use it to lead into your question). There should be enough information to give the reader the needed knowledge to follow your lab but not too long as to point out the obvious or becomes excessive. Discuss potential trends that are expected through your exploration. Need citations.
  3. **Research Question**
     1. Focused, both variables are present, style of question allows for analysis using data
  4. **Variables**
     1. Independent Variable – what is the range tested
     2. Dependent Variable – what is being measured and how
     3. Controlled Variables – what variables need to be controlled, how are they being controlled and why.
  5. **Protocol Diagram**
     1. Draw & label a diagram which best shows the major protocol(s) you used.
     2. This should focus on a technique that was used to measure the dependent variable
     3. Photograph of Lab setup
        1. Annotate this to show how variables were used, especially the controlled variables.
        2. Do NOT just label equipment.
  6. **Procedure**
     1. Written in passive voice, and past tense.
        1. You can go in detailed steps or chunk by operations in the lab
        2. You may put your variables into the method only (especially if you are running out of space), just make sure they are clear.
* **Analysis** 
  1. **Raw Data** 
     1. All collected data must be relevant to research question (do not include extraneous data)
     2. Quantitative Data Table
        1. Raw data only.
        2. Design and clarity is important.
        3. Always include titles, labels, and units
           1. Forgetting one unit or misidentifying one unit is enough to drop your score in this section
        4. Uncertainties are mandatory and can be given within column heading for equipment precision
     3. Qualitative Data
  2. **Data Processing**
     1. Appropriate manipulation of data is used.
        1. Sample Calculation
           1. Neatly lay out and explain one example only of any type of manipulation that was done to the raw data to help make it more useful for interpretation.
     2. Statistical Analysis is carried out
        1. Error propagation, t-tests, chi-square, standard deviation, etc.
     3. Presentation
        1. One or more data tables AND one or more graphs (of your processed data).
        2. Design and clarity is important (always include labels, titles, units)
        3. Demonstrating errors and uncertainties is mandatory for processed data.
  3. **Conclusion**
     1. Interpret processed data.
     2. Draw conclusions strictly based off of the data and the correlations found.
        1. Discuss variability if needed
* **Evaluation** 
  1. **Conclusion**
     1. Paragraph section in which you get a chance to discuss the results of your experiment.
     2. Place it in context to the research question (essentially answer the research question)
        1. What does the data say about the “science”
     3. Address whether your data seems to support or refute your expected trend based of the background information.
        1. Needs to be discussed, not just stated.
        2. Refer to your graphs to give support to this discussion.
           1. Avoid words “proof” or “proves”
        3. Discuss statistical tests and what the results show. (reliability/validity)
  2. **Limitations of Experimental Design**
     1. Paragraph section discusses how well your experimental design helped answer your experimental question.
        1. What worked well and why?
        2. What did not work well and why?
        3. Discuss outliers and reasons for them.
        4. Discuss what the error bars show.
  3. **Suggestions for Improvement**
     1. In reference to the limitations given in the previous subsection, what realistic and useful improvements could be made if you were to do this investigation again?
        1. Discuss how these suggested improvements will help collect more reliable/valid data and how it will extend the investigation.
* **Reference Section**
  + 1. For citations from aim section or alternative protocols.