

# Formal Lab Grade Check-off Sheet

<b>Section &amp; Requirements:</b>
<b>Title Page</b>
<b>Purpose:</b> Reason for completing experiment
<b>Background:</b> Complete coverage: <ul style="list-style-type: none"><li>-relevant literature values related to purpose included</li><li>-relevant research conducted and presented</li></ul> Sources cited & bibliography included in appendices
<b>Hypothesis:</b> Statement of claim
<b>Prediction:</b> If (options), then (predicted results), because (the why)... "Why" relates directly to information in background
<b>Variables &amp; Controls:</b> State what testing: <ul style="list-style-type: none"><li>-dependent (measured) variable</li><li>-independent (manipulated) variables</li></ul> State controls (constant/controlled variables) <ul style="list-style-type: none"><li>-include why control required &amp; how will be controlled</li></ul>
<b>Materials:</b> Specific names of each item # of each item size of each item error/uncertainties for all measurement devices
<b>Procedure:</b> numbered list extremely detailed & precise step by step instructions labeled diagrams as necessary for clarity/understanding step-by-step processes for use of equipment included contains set-up for testing steps contains manipulation and measurement of data steps contains clean up of laboratory station steps includes sufficient spread of manipulated independent variable produces sufficient data (sample size 30 or greater)
<b>Results:</b> <u>Raw Data:</u> Qualitative Data: <ul style="list-style-type: none"><li>-Labeled "Qualitative Raw Data"</li><li>-Presented in paragraph or data table format</li></ul> Quantitative Data: <ul style="list-style-type: none"><li>-Labeled "Quantitative Raw Data"</li><li>-Specific Title above data table</li><li>-Specific labels for columns &amp; rows included in data table</li><li>-Units included in data table titles/labels</li></ul>

- Error/Uncertainties included in data table
- Standardized decimal place used for data set
- Any shared or literature data noted & referenced

### Processed Data:

#### Data Table:

- Specific Title above data table
- Specific labels for columns & rows included in data table
- Units included in data table titles/labels
- Error/Uncertainties included in data table
- Standardized decimal place used for data set
- Formulas for calculations below data table

#### Graphic Representation: (scatter plots, bar, etc)

- Specific Title above each graph
- Specific labels for x-axis & y-axis
  - a) units, #'s , & errors/uncertainties included
- Statistical analysis of data included
  - a) Continuous Data: t-tests, standard deviation, calculation of mean, etc.
  - b) Discontinuous Data: chi square, box & whisker plots, stem & leaf plots, etc.
- Presented on graph paper or computer generated

### **Conclusion:**

Restated purpose

Short summary made of *experimental process*

Restated hypothesis & prediction

Hypothesis & prediction evaluation included:

- Supported or refuted based on collected data
- Specific data (qualitative & quantitative) stated to support evaluation of hypothesis

Describes why these results may have occurred:

- Restates & relates back to information presented in background **and/or** additional required research (additional citations added to bibliography as needed)

Presents detailed errors/uncertainties for lab

- Errors/uncertainties include all aspects of lab:
  - a) laboratory equipment precision & accuracy
  - b) human issues
  - c) inherent to the experimental method used (i.e. lack of control of certain aspects of the lab, etc.)

The following is included for **each individual error/ uncertainty**:

- Significance of error/uncertainty to quality and accuracy of collected data
- Describes how to specifically modify lab procedures to reduce affects of errors/uncertainties on resulting data

Describes direction of further experimentation

- Describes new direction of study related to this lab
- States new purpose
- New hypothesis with if, then, and because included