**EXPERIMENTAL DESIGN CHECKLIST**

See General Rules, Eye Protection & other Policies on www.soinc.org as they apply to every event.

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### Part I – Design and Construction of the Experiment (66 pts)

#### A. Statement of the Problem (2 pts)
- Statement addresses the experiment including variables (Not a yes/no question)

#### B. Hypothesis (6 pts)
- Statement predicts a relationship between the independent and dependent variables
- Statement gives specific direction to the prediction(s) (i.e., a stand is taken)
- A rationale is given for the hypothesis.

#### C. Variables (20 pts)
- **a. Independent (IV) & Dependent (DV) Variable (12 pts)**
  - IV Correctly identified and defined
  - Levels of IV given
  - DV Correctly identified and defined
- **b. Controlled Variables (CV) & Constants (8 pts)**
  - First CV correctly identified
  - Second CV correctly identified
  - First Constant correctly identified
  - Second Constant correctly identified

#### D. Experimental Control (Standard of Comparison) (4 pts)
- SOC logically identified for the experiment
- Reason given for selection of SOC

#### E. Materials (4 pts)
- All materials are listed and quantified
- No extra materials are listed

#### F. Procedure and Set-up Diagrams (14 pts)
- Procedure is presented in list form
- Procedure is in a logical sequence
- Steps for repeated trials are included
- Multiple diagrams of setup are provided
- All diagrams are appropriately labeled
- Procedure detailed enough to repeat experiment accurately

#### G. Qualitative Observations (6 pts)
- Observations about procedure provided
- Observations about the results provided
- Observations given throughout the course of the experiment

#### H. Quantitative Data - Data Table (10 pts)
- All raw data is provided
- Condensed data table with only the data to be graphed is provided
- Tables and columns labeled properly
- All data has units
- Example calculations for derived variables are given

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### Part II – Data, Analysis and Conclusions (94 pts)

#### I. Graph (12 pts)
- Appropriate Graph is provided
- Graph properly titled and labeled
- Appropriate scale and units included

#### J. Statistics (14 pts)
- Statistics of Central Tendency used (i.e., best fit, median, mode, mean)
- One example calculation is given for each statistic with units
- Statistics of variation are included (i.e., minimum, maximum, range, standard deviation)
- Calculations are accurate

#### K. Significant Figures (12 pts)
- Data is reported using correct significant figures
- Graph completed using correct significant figures
- Statistics are reported using correct significant figures

#### L. Analysis of Claim/Evidence/Reason (CER) (18 pts)
- Statistics Claim completed logically
- Statistics Evidence completed logically
- Statistics Reasoning completed logically
- Outliers Claim completed logically
- Outliers Evidence completed logically
- Outliers Reasoning completed logically
- Data Trend Claim completed logically
- Data Trend Evidence completed logically
- Data Trend Reasoning completed logically

#### M. Possible Experimental Errors (8 pts)
- One specific error is identified and effect on results discussed.
- Second specific error is identified and effect on results discussed.

#### N. Conclusion (8 pts)
- Hypothesis is re-stated
- Hypothesis Claim completed logically
- Hypothesis Evidence completed logically
- Hypothesis Reasoning completed logically

#### O. Applications & Recommendations for Further Use (6 pts)
- Suggestions to improve the experiment given
- Suggestions for practical applications of experiment are given
- Suggestions for future experiments are given

***Continued on back***
P. Abstract (16 pts)

- 4 3 2 1 0  Brief and well-organized
- 4 3 2 1 0  Contains the Statement of the Problem and Hypothesis
- 4 3 2 1 0  Describes the research procedure
- 4 3 2 1 0  Includes major findings and conclusion

School: ____________________________ Team# __________

Point Total: _____ /160

Deduction multiplier(s): __________________
Non-clean up (0.95), Off topic (0.75), or Non-lab (0.25)

Final Score: ____________________