EXPERIMENTAL DESIGN CHECKLIST

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

2020 Experimental Design Division C Checklist

(Note: The maximum points available for each task are shown.)

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

A. **Statement of the Problem (2 pts)**

② ① ⓪ **Statement addresses the experiment including variables (Not a yes/no question)**

B. Hypothesis (6 pts)

② ① ⓪ Statement predicts a relationship between the independent and dependent variables
② ① ⓪ Statement gives specific direction to the prediction(s) (i.e., a stand is taken)
② ① ⓪ A rationale is given for the hypothesis.

C. Variables (20 pts)

a. Independent (IV) & Dependent (DV) Variable (12 pts)

④ ③ ② ① ⓪ **IV Correctly identified and defined**
④ ③ ② ① ⓪ Levels of IV given
④ ③ ② ① ⓪ **DV Correctly identified and defined**

b. **Controlled Variables (CV) & Constants (8 pts)**

② ① ⓪ **First** CV correctly identified
② ① ⓪ **Second** CV correctly identified
② ① ⓪ **First Constant correctly identified**
② ① ⓪ **Second Constant correctly identified**

D. Experimental Control (Standard of Comparison) (4 pts)

② ① ⓪ SOC logically identified for the experiment
② ① ⓪ Reason given for selection of SOC

E. Materials (4 pts)

② ① ⓪ **All materials are listed and quantified**
② ① ⓪ No extra materials are **listed**

F. Procedure **and Set-up** Diagrams (**14 pts**)

② ① ⓪ Procedure **is presented in list form**
② ① ⓪ Procedure is in a logical sequence
② ① ⓪ Steps for repeated trials are included
② ① ⓪ **Multiple diagrams** of setup are provided
② ① ⓪ **All diagrams are appropriately labeled**
④ ③ ② ① ⓪ Procedure detailed enough to repeat experiment accurately

G. Qualitative Observations (**6 pts**)

② ① ⓪ Observations about procedure provided
② ① ⓪ Observations about the results provided
② ① ⓪ Observations given throughout the course of the experiment

H. Quantitative Data - Data Table (1**0 pts**)

② ① ⓪ All raw data is **provided**
② ① ⓪ **Condensed data table with only the data to be graphed is provided**
② ① ⓪ Tables **and columns** labeled properly
② ① ⓪ All data has units
② ① ⓪ **Example calculations for derived variables are given**

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

I. Graph (1**2 pts**)

④ ③ ② ① ⓪ Appropriate **Graph is provided**
④ ③ ② ① ⓪ Graph properly titled and labeled
④ ③ ② ① ⓪ Appropriate scale and units included

J. Statistics (**14 pts**)

④ ③ ② ① ⓪ Statistics of Central Tendency used (i.e., best fit, median, mode, mean)
④ ③ ② ① ⓪ **One example calculation is given for each statistic with units**
④ ③ ② ① ⓪ **Statistics of variation are included (i.e., minimum, maximum, range, standard deviation)**
② ① ⓪ Calculations are accurate

K. **Significant Figures** (**12 pts**)

④ ③ ② ① ⓪ **Data is reported using correct significant figures**
④ ③ ② ① ⓪ **Graph completed using correct significant figures**
④ ③ ② ① ⓪ **Statistics are reported using correct significant figures**

L. Analysis **of Claim/Evidence/Reason (CER)** (**18 pts**)

② ① ⓪ **Statistics Claim completed logically**
② ① ⓪ **Statistics Evidence completed logically**
② ① ⓪ **Statistics Reasoning completed logically**
② ① ⓪ **Outliers Claim completed logically**
② ① ⓪ **Outliers Evidence completed logically**
② ① ⓪ **Outliers Reasoning completed logically**
② ① ⓪ **Data Trend Claim completed logically**
② ① ⓪ **Data Trend Evidence completed logically**
② ① ⓪ **Data Trend Reasoning completed logically**

M. Possible Experimental Errors (8 pts)

④ ③ ② ① ⓪ **One specific error is identified and effect on results discussed.**
④ ③ ② ① ⓪ **Second specific error is identified and effect on results discussed.**

N. Conclusion (8 pts)

② ① ⓪ Hypothesis is re-stated
② ① ⓪ **Hypothesis Claim completed logically**
② ① ⓪ **Hypothesis Evidence completed logically**
② ① ⓪ **Hypothesis Reasoning completed logically**

O. Applications & Recommendations for Further Use (**6** pts)

② ① ⓪ Suggestions to improve the experiment given
② ① ⓪ Suggestions for practical applications of experiment are given
② ① ⓪ Suggestions for future experiments are given

***Continued on back ***

EXPERIMENTAL DESIGN CHECKLIST (CONT.)

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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: _____

(revised 8/23/2019)