



## 2023 Experimental Design Division C Checklist

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

### Part I – Design and Construction of the Experiment (70 pts)

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

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

#### B. Hypothesis (6 pts)

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

#### C. Variables (20 pts)

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

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

##### b. Controlled Variables (CV) (4 pts)

- ② ① ① First CV correctly identified
- ② ① ① Second CV correctly identified

##### c. Constant (4 pts)

- ② ① ① First Constant correctly identified
- ② ① ① Second Constant correctly identified

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

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

#### E. Materials (4 pts)

- ② ① ① All materials **used** are listed and quantified
- ② ① ① No **unused or** extra materials are listed

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

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

#### G. Qualitative Observations (12 pts)

- ④ ③ ② ① ① Observations about procedure provided
- ④ ③ ② ① ① Observations about the results provided
- ④ ③ ② ① ① Observations given throughout the course of the experiment

#### H. Quantitative Data - Data Table (8 pts)

- ② ① ① All raw data is provided
- ② ① ① Condensed data table with only the data to be graphed is provided
- ② ① ① Tables and columns labeled properly
- ② ① ① All data has units

### Part II – Data, Analysis and Conclusions (97 pts)

#### I. Graph (12 pts)

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

#### J. Statistics (14 pts)

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

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

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

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

- ② ① ① **Variation** Claim completed logically
- ② ① ① **Variation** Evidence completed logically
- ② ① ① **Variation** Reasoning completed logically
- ② ① ① Outliers Claim completed logically
- ② ① ① Outliers Evidence completed logically
- ② ① ① Outliers Reasoning completed logically
- ② ① ① Data Trend Claim completed logically
- ② ① ① Data Trend Evidence completed logically
- ② ① ① Data Trend Reasoning completed logically

#### M. Possible Experimental Errors (8 pts)

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

#### N. Conclusion (8 pts)

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

#### O. Applications & Recommendations for Further Use (9 pts)

- ③ ② ① ① Suggestions to improve the experiment with rationale are provided
- ③ ② ① ① Suggestions for practical applications of experiment are provided
- ③ ② ① ① Suggestions for future experiments are provided

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# EXPERIMENTAL DESIGN CHECKLIST (CONT.)

See General Rules, Eye Protection & other Policies on [www.soinc.org](http://www.soinc.org) as they apply to every event.



## P. Abstract (16 pts)

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

School: \_\_\_\_\_ Team# \_\_\_\_\_

Point Total: \_\_\_\_\_/167

Deduction multiplier(s): \_\_\_\_\_

**Materials Used (0.95)**, Non-clean up (0.95), Off topic (0.75), or Non-lab (0.25)

Final Score: \_\_\_\_\_

(revised 06/07/2022)