



# EXPERIMENTAL DESIGN CHECKLIST



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

## 2024 Experimental Design Division B Checklist

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

### Part I – Design and Construction of the Experiment (63 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) (e.g., a stand is taken)  
② ① ① A rationale is given for the hypothesis.

#### C. Variables (17 pts)

##### a. Independent Variable (IV) (5 pts)

- ② ① ① Correctly identified and **operationally** defined  
③ ② ① ① Levels of IV given

##### b. Dependent Variable (DV) (4 pts)

- ④ ③ ② ① ① Correctly identified and **operationally** defined

##### c. Controlled Variables (CV) (6 pts)

- ② ① ① First CV correctly identified **and relevant**  
② ① ① Second CV correctly identified **and relevant**  
② ① ① **Third CV correctly identified and relevant**

##### d. Constant (2 pts)

- ② ① ① Constant correctly identified **and relevant**

#### D. Materials (4 pts)

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

#### E. 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 Enough information is given so another could repeat procedure

#### F. 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

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

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

### Part II – Data, Analysis and Conclusions (69 pts)

#### H. 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

#### I. Statistics (14 pts)

- ④ ③ ② ① ① Statistics of Central Tendency (i.e., best fit, median, mode, mean)  
④ ③ ② ① ① One example calculation is given for each statistic including units  
④ ③ ② ① ① Statistics of Variation (i.e., min, max, range)  
② ① ① Calculations are accurate

#### J. 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

#### K. 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.

#### L. 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

#### M. Recommendations for Future Experimentation (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 given  
③ ② ① ① Suggestions for future experiments are given

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# EXPERIMENTAL DESIGN CHECKLIST (CONT.)

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

\_\_\_\_\_ Point Total:

\_\_\_\_\_/132

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

Materials Used (0.95),

Non-clean up (0.95),

Off topic (0.75),

or Non-lab (0.25)

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