SCIENCE OLYMPIAD
Exploring the World of Science

2019 Experimental Design Checklist for Divisions B & C
(Note: The maximum points available for each task are shown.)

Part I - Design and Construct Experiment

A. Hypothesis (6 pts)

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

B. Variables (**16 pts**)

a. Independent Variable (IV) (6 pts)
② ① ⓪ IV correctly identified
② ① ⓪ IV operationally defined
② ① ⓪ At least three levels of IV given

b. Dependent Variable (DV) (**4** pts)
② ① ⓪ DV correctly identified
② ① ⓪ DV operationally defined

c. Controlled Variables (CV) (**6** pts)
② ① ⓪ One CV correctly identified
② ① ⓪ Two CVs correctly identified
② ① ⓪ Three CVs correctly identified

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

② ① ⓪ SOC correctly identified and makes logical sense for the experiment
② ① ⓪ Reason given for selection of SOC

D. Materials (6 pts)

② ① ⓪ Materials listed separately from procedure
② ① ⓪ All materials used are listed
② ① ⓪ **No extra materials are used**

E. Procedure with Diagrams (12 pts)

② ① ⓪ Procedure well organized
② ① ⓪ Procedure is in a logical sequence
② ① ⓪ Repeated trials
② ① ⓪ Diagram of the experimental setup provided
④ ③ ② ① ⓪ Enough information is given so another could repeat procedure

F. Qualitative Observations (8 pts)

② ① ⓪ Observations about results given
② ① ⓪ Observations about procedure/deviations
② ① ⓪ Observations about results not directly relating to Dependent Variable or other data
② ① ⓪ Observations given throughout the course of the experiment

G. Quantitative Data - Data Table (10 pts)

② ① ⓪ All raw data is given
② ① ⓪ All data has units
② ① ⓪ Table(s) labeled properly
② ① ⓪ **Reports most relevant data**
② ① ⓪ All data reported using correct figures (significant figures C Division only)

Part II – Data, Analysis and Conclusions

H. Graphs (10 pts)

② ① ⓪ Appropriate type of graph used
② ① ⓪ Graph has title
② ① ⓪ Graph labeled properly (axes/series)
② ① ⓪ Units included
② ① ⓪ Appropriate scale used

I. Statistics (6 pts)

② ① ⓪ **Age-appropriate statistics (i.e., best fit, average/mean, median, mode) are used**
② ① ⓪ Example calculations are given with appropriate units
② ① ⓪ **Calculations are accurate**

J. Analysis and interpretation of data (10 pts)

② ① ⓪ All data discussed and interpreted
② ① ⓪ Unusual data points commented on
② ① ⓪ Trends in data explained and interpreted
② ① ⓪ **Interpretations based on statistics used are accurate**
② ① ⓪ Enough detail is given to understand data and all statements must be supported by the data.

K. Possible Experimental Errors (6 pts)

② ① ⓪ Possible reasons for errors are given
② ① ⓪ Important info about data collection given
② ① ⓪ Effect errors had on data discussed

L. Conclusion (8 pts)

② ① ⓪ Hypothesis is evaluated according to data
② ① ⓪ Hypothesis is re-stated
② ① ⓪ Reasons to accept/reject hypothesis given
② ① ⓪ All statements are supported by the data

M. Applications & Recommendations for Further Use (8 pts)

② ① ⓪ Specific suggestions to improve the experiment are given
② ① ⓪ Suggestions for other ways to look at hypothesis are given
② ① ⓪ Suggestions for future experiments are given
② ① ⓪ Practical application(s) of experiment are given

Team #: _____

School Name: _____

Point Total: _____/110

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

Final Score: _____

(revised 09/05/18)