

## 2016 Experimental Design Checklist for B/C (rev. 10/4/15)

(Note: all tasks listed under each section are worth a maximum of 2 points unless otherwise stated)

### A. Statement of problem (4 Points)

- Not a yes/no question and includes independent and dependent variables
- Problem is clearly testable and is written in a clear and concise manner

### B. Hypothesis (8 points)

- Statement predicts a relationship or trend
- Statement gives specific direction to the predictions(s): A stand is taken.
- Prediction includes both independent and dependent variables
- A rationale is given for the hypothesis.

### C. Variables

#### Independent Variable (IV) (6 Points)

- IV correctly identified
- IV operationally defined
- At least three levels of IV given

#### Dependent Variable (DV) (6 points)

- DV correctly identified
- DV operationally defined

#### Controlled Variables (CV) (8 points)

- One CV correctly identified
- Two CVs correctly identified
- Three CVs correctly identified
- Four CVs correctly identified

### D. Experimental Control (Standard of Comparison-SOC) (4 points)

- SOC correctly identified and makes logical sense for the experiment
- Reason given for selection of SOC

### E. Materials (6 points)

- All materials used are listed
- All materials used are listed properly (no extras)
- Materials listed separately from procedure

### F. Procedure: Including Diagrams (12 points)

- (2pts) Procedure well organized
- (2pts) Procedure is in a logical sequence
- (2pts) Diagrams used
- (2pts) Repeated trials
- (4pts) Enough information is given so another could repeat procedure

### G. Qualitative Observations (8 points)

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

### H. Quantitative Data - Data Table (12 points)

- All raw data is given
- All data has units
- Condensed table containing most important data
- Table(s) labeled properly
- Example calculations are given
- All data reported using correct figures (significant figures C Division only)

### I. Graphs (10 points)

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

### J. Statistics Division B&C (6 points)

- Such as: average (mean), median, mode, range, line of best-fit or other appropriate statistic used

### K Analysis and interpretation of data (8 points)

- All data discussed and interpreted
- Unusual data points commented on
- Trends in data explained and interpreted
- Enough detail is given to understand data and all statements must be supported by the data.

### L. Possible Experimental Errors (6 points)

- Possible reasons for errors are given
- Important info about data collection given
- Effect errors had on data discussed

### M. Conclusion (8 points)

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

### N. Applications and Recommendations for Further Use (8 points)

- Suggestions for improvement of specific experiment are given
- Suggestion for other ways to look at hypothesis given
- Suggestions for future experiments given
- Practical application(s) of experiment given