

Experimental Design Rubric for B/C

a. Statement of problem (2 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 (4 points)

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

c. Variables

Independent Variable (IV) (3 Points)

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

Dependent Variable (DV) (3 points)

- (2pts) DV correctly identified
- DV operationally defined

Controlled Variables (CV) (4 points)

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

d. Experimental Control (Standard of Comparison-SOC) (2 points)

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

e. Materials (3 points)

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

f. Procedure: Including Diagrams (6 points)

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

g. Qualitative Observations (4 points)

- Observations about results given
- Observations about procedure/deviations
- Observations about results not directly relating to DV
- Observations given throughout the course of the experiment.

h. Quantitative Data - Data Table (6 points)

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

i. Graph(s) (6 points)

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

j. Statistics **Division B&C-** (2 points)

- Average (mean), median, mode, range, or drawn in line best of-fit

Division C only (4 more points)

- Measure of central tendency
- Measure of variation
- Regression analysis
- Other appropriate statistic used

k. Analysis and interpretation of data (4 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 (3 points)

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

m. Conclusion (4 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 (4 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