

# Experimental Design

# 1. Statement of problem

- Not a yes/no question
- Independent and dependent variables included
- Problem is clearly testable
- Response is written in a clear and concise manner

## 2. Hypothesis

- Statement gives specific direction to the predictions: A stand is taken.
- Prediction includes both independent and dependent variables
- Statement gives enough information to understand predictions
- Response is written in a clear and concise manner

## 3. Variables

- Independent Variable ,dependent variable, and standard of comparison must be operationally defined.

## 4. Materials and Procedure

- All materials used are listed
- Materials listed separately from procedure
- Procedure well organized
- Procedure is in a logical sequence
- Enough information is given so another could repeat procedure
- Diagrams used
- Repeated trials

# 5. Qualitative Observations

- Observations given at start of experiment
- Observations given middle of experiment
- Observations given end of experiment
- Adequate detail given to understand

# 6. Quantitative Data

## ■ Data Table

- All raw data is given
- All data has units
- Tables labeled properly: titles, units, headings
- Example calculations are given
- Appropriate statistics are given (example: average)

# 6. Quantitative Data

## ■ Graphs

- Appropriate type of graph used
- Graph has title
- Graph labeled properly: axes, series
- Unites included
- Appropriate scale used
- Trends in data are represented

## 7. Analysis and interpretation of data

- All data discussed and interpreted
- Unusual data points commented on
- Trends in data explained and interpreted
- Enough detail is given to understand data

## 8. Possible Experimental Errors

- Possible reasons for errors are given
- Effect errors had on data discussed

# 9. Conclusion

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

# 10. Recommendations for further experimentation

- Suggestions for improvement of specific experiment are given
- Suggestions for future experiments given
- Further predictions made based on results
- Practical applications of experiment given

# CRITERIA

- Creativity and originality
- Clear statement of objectives; identification of all relevant variables
- Scientific Approach
- Lab note book
- Conclusion consistent with data
- Clarity of Presentation
- Display Board