

**Experimental Design Resource Sheet**

1. **Identify the problem.**
   * Write your problem statement or question.
   * Make sure it is specific and measurable.
2. **Formulate a hypothesis.** A hypothesis MUST: Be testable, falsifiable and based on previous research (class lecture counts for us!).
   * Record you hypothesis in the form of an If…Then Statement.
   * Indicate your independent and dependent variable.
     + Independent Variable: varied or manipulated, presumed cause.
     + Dependent Variable: measurable response, not manipulated, presumed effect .
3. **Design the procedure to be used to test the hypothesis.** Include the following:
   * Safety concerns
   * List of all materials used
   * Identify a control to be used for comparison if applicable- if no control is necessary explain why
   * List all control variables that could affect the outcome of the experiment and note the ones you cannot control in this setteing
   * Clearly define how the data will be collected and recorded, including measurement units
   * Design a data table to use to record information
   * Plan the strategy that will be used to summarize the data, for example, a graph might be used to summarize the data
   * Get the OK from your instructor
4. **Carry out the experimental procedure.**
   * Carry out Procedure
   * Follow step-by-step procedure.
   * Collect the data in data tables.
   * Make and record observations.
5. **Analyze your data & draw conclusions.**
   * Logically and clearly present all data and observations in the form of graphs and charts.
   * You can print out any tables or graphs and paste them into your lab journal.
   * Also, be sure to save all documents, tables and graphs on your USB for your web portfolio.
   * Clearly and concisely analyze all data and observations.
   * Write a conclusion statement followed by a conclusion paragraph. Was your hypothesis rejected or supported? Why or why not? Explain the rationale for the conclusion and clarify any details. Discuss any possible sources of error. Anything that might have affected the results of the experiment.