Experimental Design Format

**Title:** The effect of (IV) on (DV)

**Question/Problem/Purpose:**

(Background research or observation: any background notes, key terms, things you already know about the topic, or questions you have that you still don’t understand.)

**Hypothesis:** If the (IV) is (modified in this way), then this will happen to the (DV):

- (Accept Hypothesis if... )
- (Reject Hypothesis if... )

**(Identifying Experimental Components)**

- Independent Variable:

<table>
<thead>
<tr>
<th>Independent Variable:</th>
</tr>
</thead>
<tbody>
<tr>
<td>These boxes show how the IV is modified (you don’t need to use them all)</td>
</tr>
<tr>
<td># Trials of each I.V.</td>
</tr>
</tbody>
</table>

- Dependent Variable (how measured or described):
- Constants (what needs to be kept constant to make sure the experiment is controlled)?
- Control Group:
- Experimental Group(s):

**(Draw/sketch** experimental set up: )

**Procedures:** write out your procedures in a numbered step-by-step format. Be sure to get them approved before you begin (if they are not preapproved).

**Data:** design a table to record your data in (include class data whenever possible). Optional: also take pictures of your experiment.

*Remember all data tables should have an appropriate title, heading labels, & units.*See fig.1

**Analysis:** Graph your data with the IV on the x-axis and DV on the y-axis (D.R.Y. M.I.X.). If there are appropriate calculations to be computed, calculation analysis should go in this section too.

*Remember all graphs should have an appropriate title, axes labels, & units. (Title may be the same as Data Table).*

When creating graphs...remember: DRY MIX and TAILS

Fig.1

<table>
<thead>
<tr>
<th>D- Dependent variable</th>
<th>M- Manipulated</th>
<th>T-Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-responding or reactive</td>
<td>I- independent variable</td>
<td>A- Axis labels</td>
</tr>
<tr>
<td>Y-axis</td>
<td>X-axis</td>
<td>I-Intervals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L-Labels</td>
</tr>
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<td></td>
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<td>S-Scale</td>
</tr>
</tbody>
</table>
Conclusion: Writing a Scientific Argument (4 major components, each section should be **at least** 1 paragraph)

- **Summary**: Conclusion or explanation of the problem you were trying to solve. Give a brief summary/overview of experiment (including a brief description of the procedure used & the general results). State if your evidence supports your hypothesis & if you accept or reject your hypothesis (based on the data collected).
- **Evidence**: provide a detailed description of measurements and observations, and a summary explanation of each piece of data collected. Discuss class data whenever possible.
- **Reasoning**: Give possible scientific explanations as to why the evidence supports your conclusion. Justify why the results may have come out the way that they did by making connections to concepts learned in class to logically & scientifically explain the results that were observed.
- **Reflection**: (you should include **at least** 3 of these)
  - What would you do to make your evidence stronger? If you could do this again, would you do anything differently? If so, what?
  - What did you miss in your data collection?
  - What were unavoidable sources of error and **how** do you think they may have impacted your data?
    - Sloppy lab work, inaccurate calculations, “human error,” and not following directions don’t count. Think about flaws in the experimental design, uncontrolled variables you hadn’t anticipated, additional constants needed, etc.
  - What did you already know before and what did you learn?
  - What else would you like to learn?
  - How does the information relate to what we are learning in class?