**IA BIO Design Template**

**Title of Experiment**

1. **Aim** ( a brief statement, 1-2 sentences, statement of the purpose of experiment, in own words):
2. **Safety Precautions** (Record any relevant safety information):
3. **Introduction**
4. Focused Research Question- BE DETAILED AND SPECIFIC!!

How does \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_affect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

(independent variable with units) (dependent variables with units and description of sample group)

**OR**

Is (are) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_as effective as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

1. Background

What do I already know about the topic of the experiment (any prior knowledge and or reference to text or other resource material)?

1. Hypothesis

Make a prediction on what you expect the outcome of the experiment will be.

Explain why you expect this result?

1. **Identifying Variables**
2. Independent Variable (this is the variable you change or manipulate)
3. State your independent variable (must be quantitative).
4. What are the units of measure for your independent variable?
5. What are the settings/treatments you are using for this experiment should have at least 5 treatments (one of the 5 can be the control if it is a controlled experiment)?
6. Why/How did you select these settings/treatments?

1. How will you obtain/measure this?

B) Dependent Variable (this is the resulting outcome of your settings or what you measure at the end of the experiment)

1. State your dependent variable (must be quantifiable).
2. What are the units of measure for your dependent variable and the precision of the instrument?
3. How will you obtain the measurements for this variable?
4. Fixed/constants/controlled Variables- Identify a *minimum* of 4 (these are the factors that could impact your results if not kept the same throughout the experiment).
   1. Variable 1
   2. Variable 2
5. Variable 3
6. Variable 4
7. Explain why it is important to keep each of the identified fixed variables the same; describe the impact each could have on your data.
   1. Variable 1
   2. Variable 2
   3. Variable 3
   4. Variable 4
8. How did your procedural design ensure that the variables were the same throughout the testing? In what steps of the procedure is each identified constant being controlled?
   1. Variable 1
   2. Variable 2
   3. Variable 3
   4. Variable 4
9. **Procedure**
   * 1. List Necessary Equipment, be specific and state precision
     2. Illustration of Experiment Layout (if necessary)
     3. Step by Step Method Used (written in third person and could be repeated EXACTLY by another person). Include replicates of each treatment – a minimum of 5. Include when and how data will be collected and where it will be recorded.

**7. Sample data table:**