

Scientific Experiment Guidelines

1. **The Investigative Question:** What specific question are you hoping to answer? Questions should be specific and testable.
2. **Prediction / Hypothesis Statement:** What you assume you will observe or find through performing the experiment. Predictions are written in the if....then format. Your hypothesis is your preliminary explanation for your prediction, written as “because... in your statement. (If..., then..., because...)
3. **Manipulated Variable:** (Independent variable) The one variable in the experiment that is different from the others. You control this variable.
4. **Responding Variable:** (Dependent variable) The variable in the experiment that will respond in some way to the difference in the manipulated variable.
5. **Constant Variables:** The variables in the experiment that do not change.
6. **Materials:** A specific list of everything you will need in order to test your hypothesis.
7. **Procedure / Methods:** Steps for performing and completing the experiment.
 - Every numbered step should be a complete sentence.
 - These steps need to be very specific, including every little thing that needs to be done including the type of data to be collected, measurements and units.
 - The steps need to be written so someone else can follow them (like a recipe).
 - The steps need to be written in complete sentences and in the third person format, as if you are giving commands, do not include the words “I” or “We”.
 - i. e.g.: Add 10ml of water to the beaker.
8. **Results: Data Tables:** Before conducting your experiment, you need to design a data table based on the information being collected. It needs a title that represents the relationship between the manipulated and responding variables. All columns should be labeled and include proper units. **Graphs:** Graph the data you collect in either a line, bar or circle graph. The format is based on the type of data collected and should best display the information you are trying to support in your hypothesis. *Manipulated variable should be labeled on the x-axis, responding variable on the y-axis.* All graphs should have titles as well.\
9. **Claims & Evidence T Chart:** This step analyzes what your data means. Start each claim with “I claim...” and each evidence example with “because...”. The evidence that supports each claim should come *directly from your data table or graph.* You must use specific numbers / observations.
10. **Conclusions:** Here you will answer the following questions:
 - a. Introduction sentence(s) must include the topic of study and investigative question.
 - b. Describe your major findings (data) as it relates to your hypothesis.
 - c. Explain if your data supports or refutes your hypothesis and include specific evidence.
 - d. Describe what you learned from your experiment, connect it to the content / topic of study.
 - e. Describe sources of error in your experiment. How would you improve it if you had to do it again?
 - f. Describe new questions you now have related to your experiment, investigative question or topic of study. What else could you explore?