

# Science Inquiry

## Writing a Lab Report

### Problem (Question)

- What is the question you want answered?
- A statement may also be used to explain what you are trying to find out or learn

### Hypothesis

- Your testable prediction of what you think will occur, based on your background experience.
- If... (Independent variable), then... (Dependent variable)...because (support for what you think will happen).

### Materials (Equipment or Apparatus)

- What do you need for the experiment? The list must be accurate, complete, and specific.

### Variables

#### **Independent Variable:**

- This is the manipulated variable
- The one factor you are changing or testing

#### **Dependent Variable**

- This is the responding variable based on the factor you are changing
- It is what you are attempting to measure

#### **Control Variables**

- Factors that stay the same in order to conduct a fair test

### Method (Procedure)

- The steps someone will need to follow in order to replicate (repeat exactly) your experiment.
- The steps should be numbered

### Results

- Data collected
- Include any calculations
- Use charts, tables, or graphs whenever possible

### Observations

- Comment on what you saw occur during the lab
- Describe any unusual occurrences or difficulties you had
- Discuss any changes you might make to your procedure

### **Conclusion (Analysis)**

- State if the hypothesis was true
- Explain why you think your results occurred
- Sum up the experiment
- Include a thorough discussion of the data
- Explain whether the data supports or rejects the hypothesis

### **Application (Reflection)**

- Explain how what you learned can be applied to everyday life
- State how results could be useful
- What were the sources of error in the experiment (factors that may have affected the experiment)
- If you had the opportunity to redo the experiment, what changes would you make? How could you improve it?
- Do you feel the data is valid (reliable and accurate)? Why or why not?

### **Scientific Method Definitions**

1. **Scientific Question:** a question that can be answered using scientific problem-solving.
2. **Hypothesis:** an explanation for observations that can be tested using an experiment.
3. **Variable:** in an experiment, anything that might cause a change in the outcome.
4. **Independent Variable:** in an experiment, a variable that is deliberately changed by the experimenter.
5. **Dependent Variable:** in an experiment, a variable that changes as a result of changes in an independent variable.
6. **Control:** in an experiment, a method of ensuring that unknown variables are not affecting the results.

## Experimental Procedure

In this year's science course you will conduct experiments and other lab activities . Experiments are used to answer questions about the world around you . Lab experiments should be organized as follows :

- Purpose-** The purpose should answer the questions : Why is the experiment being done? What question do you hope to answer?
- Hypothesis-** The hypothesis is a written statement about what you think will happen in the experiment based on your past experiences.
- Materials-** This is a list of the materials needed for the experiment.
- Method-** This section deals with the steps that must be followed in order to properly complete the experiment.
- Observations-** In this section a written description of what happens in the experiment is included. Questions to be answered may deal with the following: What happened? What did you see, hear or smell? What changes occurred? How do you know these changes occurred? Also this section usually deals with numerical results recorded either in chart or table form. A diagram is sometimes included to show all the equipment.
- Conclusions-** An answer is written for the question posed in the purpose. This answer is based on the results of the experiment. An evaluation of your hypothesis is also written here. Finally, explain why your results turned out the way they did.

\* Application \*

What could you do with this information?  
How could you apply your knowledge?