

Topic 1: Scientific Method – 1a. Lab Report Format

It is important to standardize the laboratory report that students will turn into the teacher for two reasons:

1. It helps to direct the student through the logical steps of the scientific method and it helps them to focus their efforts and to organize their thoughts.
2. It helps the teacher to evaluate student progress in a consistent and efficient manner.

It is also advantageous for a science faculty member to adopt the same format for all of their science courses so that the student can move from one discipline to another smoothly. It reinforces the scientific method and its universal application in all of the sciences.

In this lab report format several things are emphasized. One is the use of “to determine” in the purpose statement. This should clarify why the student is doing this lab and reinforce the connection between the lab and the subject matter that is being covered in the class. Secondly, including a reasoning statement in the hypothesis gives the teacher information about the base knowledge this student has coming into the lab. Sometimes students have no previous knowledge and will tell you their hypothesis is just a wild guess and, at other times, you may learn that the student has had previous experiences that he/she is applying to this experiment. Thirdly, the use of a picture procedure forces the students to think about what they are going to do in this experiment and prevents them from simply recopying instructions from a lab manual or textbook. Finally, the NLQ, or next logical question, is an attempt to make the student think what additional lab work could be done in the future to obtain more information concerning this particular lab problem. Not only does it force the student to think at the next level, it gives the teacher some insight into the critical thinking skills of the student.

Science Standards: Writing Lab Reports

Title:

Purpose: 2 sentences (Include the words “to determine.”)
Explain what you are trying to determine.
Explain how the experiment will be done.

Descriptive List: *(when appropriate)*
Dependent variable (Responding variable; what you measure)
Independent variable (What you manipulate or change)
Constants (Variables that need to be kept the same)
Control (Biological sciences when appropriate)

Hypothesis: *(when appropriate)* 2 sentences
Predict how the dependent variable will respond.
Explain the reasoning behind your hypothesis.

Procedure: A picture procedure that summarizes what needs to be done in lab

Evidence: Observations and/or data. ALL NUMBERS MUST HAVE UNITS!
Calculations must show work. Graphs on graph paper or computer

Questions: Answers must be written in complete sentences that combine the question and the answer. DO NOT USE “it, them, and they.” Don’t start sentences with yes or no.

Conclusion: (1 or 2 paragraphs)
First paragraph:

- Restate the purpose.
- Present the data (numbers) you obtained. Use class data when possible.
- Analysis: “The data shows that . . . This means that . . .”
- Hypothesis: Supported or rejected?
- How does this lab apply to the current topic being studied?

Second paragraph: **Error analysis** *(when appropriate)*

- The second paragraph describes an experimental error and states if the error would cause the dependent variable to be higher or lower than expected.
- The experimental error cannot be “human error”; it must be specific. What exactly did the human do incorrectly?

NLQ: