Lab Notebook Guide

The following is what I expect from your lab notebook. Make sure you include the following information in all labs unless I **specifically** say not to:

Names of members of your lab group.
Dates the lab was performed.
Title of the lab.

Purpose: The purpose section is where you tell the reader your reason for doing the lab in the first place. This should be three or four sentences long, though it will obviously vary depending on the difficulty/complexity of the lab.

Hypothesis: One sentence that says "If [what you do/independent variable], then [what you think will happen/dependent variable]." Keep it general – don't say, "If I do A, B, C, D, E…" – just tell me what you want to try.

Materials: A very complete list of the materials you use. You can update this during the course of the lab, as needed.

Procedure: A complete list of what you did during the lab (a bulleted list is fine). Generally, you will need to do this before you start the lab – obviously, if something goes wrong you can change it to reflect what you did to fix it.

Results: This is where you write down all of your raw data, both qualitative and quantitative. Quantitative data should be in some easy-to-read format.

Data manipulation: Where you try to make sense of your data. If you do calculations or make any graphs or charts, put them here.

Conclusion: Includes the following:

- One sentence that directly restates the hypothesis as either true or false. If the hypothesis says "If [I do something], then [something else happens]" and it turns out you were right, this sentence should say "When [I did something], [something else happened]."
- If the hypothesis didn't work, an explanation of what you think went wrong. These should be specific suggestions (I should have heated the mixture to 55^0C), not general ones (I should have heated it more).
- A brief error analysis section. You should list at least two things that could have caused errors in the lab as well as ways you can prevent them in the future. The errors you mention should be reasonable (based on your results) and something that you can actually fix in future labs (not "mystery errors" that are impossible to verify).

Good rules of thumb when writing a lab:

- **Be complete!** When I ask for the above, that's truly what I'm looking for.
- **Be neat!** If I can't read it, I won't grade it. Truly.
- **Get help if you need it.** Feel free to ask for help if you're stumped. (However, don't expect that you'll always get a complete answer – I want you to *think*!)
- **Be brief!** Some students think that if they write far more than is necessary, they will get a good grade. That's not the case – when I grade your labs, I use the grading sheet on the next page of this handout. Anything additional you write probably won't even be read, as it's not necessary.
- **Be honest!** If you screw up the lab, it's not a big deal. Everybody gets weird answers sometimes, and even an abject failure to achieve the lab's goal will only result in a 2% penalty if you can explain why it happened. Even more importantly, I have great respect for people who can own up to having made mistakes and have learned from their experiences.
- **Turn it in on time.** Not on time = no credit.

On the next page is a copy of the sheet I will use to grade each of your labs. Refer to it often when writing up labs to ensure that your grade is as high as possible.

Lab Grading Sheet

Student name(s): _____

Lab Title: _____

Appearance:
- Lab date, title, participants are written at the top of the first page (1 pt): ____
- The lab is neat (2 pts): ____

Purpose:
- The reason for performing the lab is clear, but not overly wordy (2 pt): ____

Hypothesis:
- The hypothesis is a one sentence if, then statement (2 pt): ____
- The independent and dependent variables are reasonable (4 pt): ____

Materials:
- The materials list is complete (2 pt): ____
- A sketch of the lab equipment is provided, if applicable (2 pt): ____

Procedure:
- Every step of the experiment is included (2 pt): ____

Results:
- Qualitative observations are recorded (3 pt): ____
- Quantitative data are recorded in a proper form (3 pt): ____
- Data tables are properly labeled and neatly drawn (1 pt): ____

Data manipulation:
- Proper graphs and charts have been included, if applicable (3 pt): ____
- Graphs and charts are correctly written/drawn, if applicable (3 pt): ____
- Calculations are correct and complete, if applicable (5 pts): ____

Conclusion:
- Includes one sentence that confirms or disproves the hypothesis (1 pt): ____
- A complete error analysis, showing at least two sources of error and possible ways of compensating for them in the future (4 pt): ____
- Explanation of the data (5 pt): ____
    - If the hypothesis was correct, you should explain why it was correct based on your data.
    - If the hypothesis was incorrect, you should explain why the data show it is incorrect and explain what you could have done better. Incorrect hypotheses generally require more explanation than correct ones!
- The hypothesis was correct (1 pt): ____
- The lab was left tidy at the end of class (3 pts): ____

Total points: ____ /50

Overall grade: _____