Lab Reports

The lab report is divided into a few sections:

* Title
* Objective
* Introduction
* Materials
* Procedure
* Data/Observations
* Analysis
* Results
* Conclusion/Discussion

Each part serves a purpose, and they’re meant to go in sequence. The **title** is what the lab is, who is performing it, and for whom it is performed. **Objective** is why you’re doing the lab. The **introduction** explains how you planned ahead to carry out that objective, whether through simple class ideas or other research. The **materials** are what you believe necessary to complete the lab. The **procedure** is carried out with those materials. During this time you take **data** and write down **observations**. Later, you **analyze** this data. You summarize the **results** of your experiment in words and graphs. Finally, you come to **conclusions** about if the lab was successful and **discuss** other possibilities. Let’s look at these in more detail.

**Objective**

This is a one sentence (or *maybe* two sentence) explanation of what you hope to achieve in this lab. Most academic labs have an objective along the lines of “To study \_\_\_\_\_\_\_\_\_”.

**Introduction**

The introduction gives the most basic information about the lab. You usually start out with why your subject is useful. From there, you give a theoretical idea of what you are doing. This usually involves writing equations down. Most labs use only one or two equations. Finally, give a quick explanation of what you’ll be doing in lab and how you’ll come to your conclusions.

**Materials**

This is a list of materials. No sentences. Just a list. Someone who wants to perform the lab can just go and get these materials easily and try it out. You can assume certain materials like a table or water. Things like stopwatches, Vernier calipers, or computer software need to be listed.

**Procedure**

This is a step-by-step procedure. You can write this is a “1, 2, 3…” list, bullet-point list, or in paragraphs.

Generally, paragraphs are more difficult to read in a lab setting.

**Data/Observations**

This is the raw data you will take in lab. It is important you write the data as-is, and include observations. Little things like “it took a long time to bubble” or “the car was a little off track” can make a difference. Don’t interpret these things, just write them down in little notes along the way.

**Analysis**

These are the numerical analyses you will do with your raw data. If you are doing a series of calculations, just show a sample calculation and explain how you did it. If you’re using software, explain how to use it. Again, an unfamiliar person should be able to follow your analytical method to work with their own data.

**Results**

This is just a summary of your results. This usually includes tables and graphs, with some explanation about what to notice. **Don’t interpret anything!** You’re just saying what numbers you got based on your data and observations. Save your opinions for the next section. Let’s look at quick example:

 *Result:*  The last point from the table was large in comparison to the others.

 *Opinion:* The last point was too large for this experiment, so we assumed it was a bad data point.

**Conclusion**

This is where you put all of the conclusions you drew from the lab. It can include your opinions about data, and how well the experimental data fits with your theoretical model. This should be the longest section of your lab report, with a minimum of three paragraphs:

 1 State your results & interpretations

 2 Does it fit the theory?

 3 How would you improve the lab?

You should also discuss how you can apply these ideas from the experiment. This can mean any additional experiments you could do from here. This usually fits into that third paragraph.

In addition, labs usually include a series of discussion questions. You can put the discussion questions in your conclusion or make a new section for that. In academic labs, this is usually a set of questions that guide your discussion. Beyond academics, contractors usually want a set of questions answered from lab experts. Either way, it is necessary to answer the discussion questions.

Total Length

The length of the lab report should not to exceed two pages, but including graphs and figures may be 5 to ten pages. Concision is key to a good report. You are free to break a few rules of English in order to achieve this goal. Use fragments. And don’t be afraid to start sentences with Boolean terms. Prepositions are okay to end sentences with. But don’t go to crazy with this stuff!

There are really only two writing parts: introduction and conclusion. Intro is usually *at most* a half page. Conclusion is usually *at least* half a page. If you have very few conclusions, was it really worth going to lab?

Only one lab report is needed per group. Choose members wisely. Copy/paste and email. Use technology to your advantage!

Good luck. And have some fun in lab.