

## Chemistry Lab Report Format

The formal lab report will have the following main titled sections...

- Title
- Abstract (advanced courses)
- Introduction
- Methods
- Results
- Discussion
- References

**TITLE-** A good title accurately describes the content of the lab in the fewest words possible but with enough detail to tell the reader what the lab is about.

### **ABSTRACT**

Summarize each major section of the lab report--Introduction, Methods, Results, Analysis, and Conclusion--in 1 sentence each (two if a section is complex). Then string the summaries together in a block paragraph in the order the sections come in the final report. This is a miniature version of the entire report.

Five essential components of the abstract:

- Background- defines important concepts, theories or laws being examined.
- Statement of purpose- indicates what you are attempting to do in the experiment.
- Summary of Procedure- What methods did you use? This must be a summary, not a detailed procedure.
- Summary of Results- What happened? Summarize observations and results of calculations and graphs.
- Significance of Findings- What important concepts are reinforced by the results? Include experimental errors or limitations that might have negatively influenced your results.

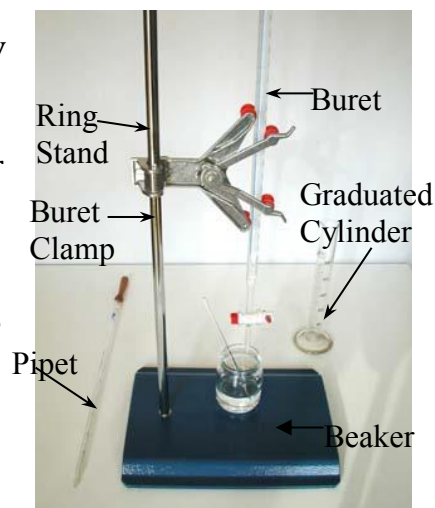
### **INTRODUCTION** – Establishing a Context for the Lab

The introduction is a short essay that sets up the laboratory activity. In paragraph one, the concepts that are relevant to the investigation are explained starting with the broad topic (principle, theory, law) and narrowing down to the specific concepts that the procedure will be applying. **This part is written in present tense.** In the second paragraph, specific science concepts must be directed to imply what you will be doing to accomplish the purpose. Essentially, you will *summarize* the procedure. Finally, the end of the introduction will be the thesis statement of the report: the purpose of the experiment. Write in sentence form the objectives for this lab--specific things you are being asked to do, such as measure, analyze, observe, test something, etc. If your lab experiment requires a hypothesis statement, include it in this section.

## METHODS

The methods section is a concise chronological description (**in narrative form**) of the laboratory procedure you used in the lab. It's important to remember that even though the teacher who reads your lab report already knows the lab procedure, you should write it as if he or she did not. The point is to demonstrate that you have a solid grasp of the procedure you followed. Materials used are mentioned within the context of the procedure and need not be listed in a separate section.

1. Write the procedure **in narrative form**, not a numbered list of steps, and should not be in a "recipe" form .
2. Describe what you actually did, even though it may be somewhat different from the ideal procedure in the lab manual. The Methods section should be an accurate reflection of what you did, but in a summary format. Specific materials used should be mentioned.
3. Write in the third person. Avoid using the words "I" or "we" when referring to the experimental procedure. Use the proper **past tense and passive voice**. Methods are usually written in past tense because you are describing what you have already done. They are also typically written in passive voice ("Two ml. *were pipetted* into a test tube").
4. There should be enough detail that anyone reading it should be able to perform the experiment and get similar results.
5. The procedure is NOT to be an exhaustive description containing minute details. It should omit information that can be assumed by peers.
6. Complete sentences will be used and any non-standard abbreviations used will be defined. For example, deionized water (DIH<sub>2</sub>O) is used in many labs. Notice that the abbreviation is in parentheses after it has first been defined.
7. Drawings or pictures of specific equipment may be included. These drawings or pictures must be numbered and titled, and the equipment must be labeled within the drawing. The drawing must be near the step where it is mentioned.



*Figure 1.1: Titration Lab Equipment*

## RESULTS (This section includes your data, observations, analysis and calculations)

### **Data**

Quantitative data will be presented in tables that are numbered and titled to summarize the measurements that are being displayed. These tables will have columns or rows headed with a description of the measurement being recorded. The measurements must be written with the correct units and significant figures. The following is an example of a typical table:

**Table 1.1: Volume of Water Before and After Adding the Metal Sample**

Final Volume (mL)	Initial Volume (mL)
48.3	53.1

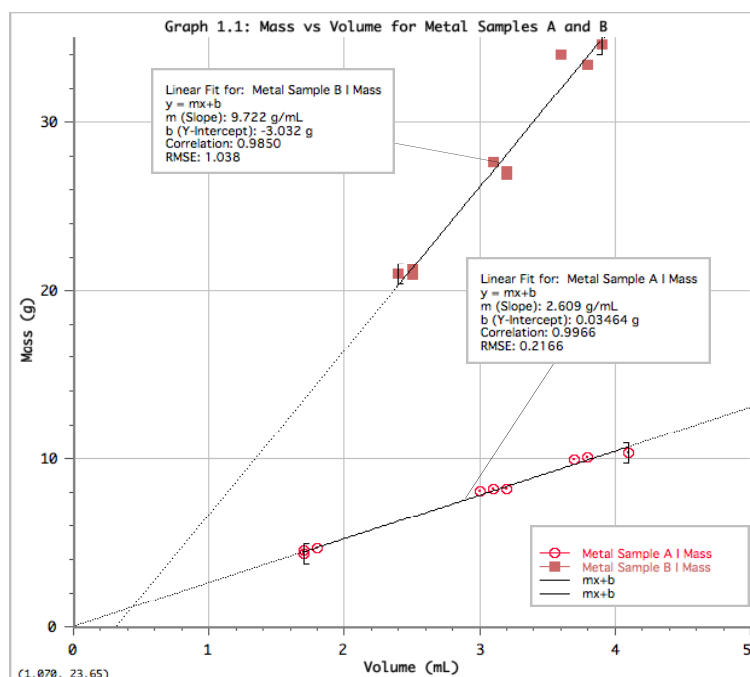
**Observations:**

Qualitative observations show that you have been paying attention during the lab and can describe what happened. Qualitative observations may be described in words or pictures or drawings. Problems you encountered and how you solved them should also be included here.

**Analysis and Calculations**

1. In most cases, an analysis of the data will be a series of calculations that is done with the data that was collected in order to answer the question.
2. The calculations will be done in a logical, step-wise fashion in order that the reader may understand what was done with the data collected and how it relates to the purpose.
3. Each step must include a brief written description of what is being calculated. Any formulas that are used will be presented.
4. Sample calculations are correctly solved and shown with one complete calculation for each type utilized. All answers must contain the correct units and significant figures.
5. If appropriate, calculate the percent error:
6. Any graphs that are generated will be numbered and titled. Each axis must be labeled with the measurement and the unit used.

**Graph1.1: The Relationship between Mass and Volume for Two Unknown Metal Samples**



7. Tables that are made to organize calculations done will follow the format for any tables and the numbering will be consecutive.

**Table 1.2: Densities of Each Metal Sample Calculated**

<b>Metal Sample</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>Average</b>
<b>Density (g/mL)</b>	11	11	11.3	12.0	11

## **DISCUSSION**

This is the most important section of the report. It is **written in the past tense**. Writing in the 3<sup>rd</sup> person is preferred for this section. This is your chance to discuss the results you obtained. This section begins with an opening sentence that is a restatement of the lab purpose. You must discuss how the data you collected helped you come to your conclusion, and how the data either does, or does not, support your hypothesis, or how it is used to fulfill the purpose if a hypothesis was not required. Avoid using phrases like “proved” or “disproved” or that your hypothesis was “correct” or “incorrect.” Words like “supported,” “indicated,” and “suggested” are more acceptable ways to evaluate your hypothesis. Be sure to clearly explain your thought processes and elaborate on what the data means. Use specific numerical data to support your conclusions. Always refer to any tables and graphs you have produced to show the relationships in your data. Sources of error that may have contributed to discrepancies between observed and theoretical (expected) results should be identified and their impact discussed. Human error is automatic and should not be discussed except in cases where it is significant or biases the data in one direction. Finally, further investigations should be discussed. This may include refinements or modifications of the current procedure or related new topics of investigation.

## **REFERENCES**

Any information or graphics used to create this report must be cited in the text and on a separate works cited page at the end of the report. All citations should be made in MLA format.

For more help writing the lab report see...

the LabWrite Program at North Carolina State University  
[http://www.ncsu.edu/labwrite/index\\_labwrite.htm](http://www.ncsu.edu/labwrite/index_labwrite.htm)