

# Chemistry: Lab Report Format

## Why are lab reports necessary?

Labs provide the opportunity for skills learned in class to be applied in a hands-on, minds-on situation. Experiments performed throughout the year will require you to use problem solving skills to accurately analyze data that is collected. You then have the opportunity to show that you have comprehended the chemistry that we are covering in class by writing a lab report which will require you to draw conclusions and make connections to chemistry concepts.

In order to successfully complete a lab report you must fully understand the chemistry involved in the experiment. It is therefore recommended that you ask **as many questions as you need to** prior to completing the lab report as well as use your group members to discuss the experiment and share ideas. For every lab report that you are asked to write be sure to refer back to this format sheet.

### **Basic Guidelines:**

- Use only pen or a computer
- If you are working through calculations, correct them as neatly as possible.
  - Ex. ~~Mistake~~
- Title page should include the following:
  - Name of lab report, your name, teacher's name, group members' names, and the date the lab was performed
    - The title of the lab should be centered in the page
    - All other information should be written in the lower right hand corner
- ORDER:
  - Hand in lab reports, stapled, in the following order:
    - Title page, Abstract (separate page), Purpose, Hypothesis, Materials, Procedure, Safety, Data & Observations, Calculations and Data Analysis, Conclusion (separate page), and Lab Rubric
- Collaboration is required during the experiment and discussion of data is recommended but all lab reports are to be **individually written**. Duplicate lab reports or portions of labs that are too similar will be given a zero.
- If you are asked to find background information, always include a works cited page. Failure to do so will result in an automatic 10% deduction of points.

### **PRE-LAB WORK:**

Before you walk into the lab to collect data, the following two sections of the lab need to be completed:

#### **Purpose & Hypothesis:**

Purpose: A statement of the problem or a question posed that needs to be answered. Purpose needs to be as specific as possible and will usually start with, "To..."

Hypothesis: A prediction of expected results.

#### **Materials, Procedure, and Safety:**

- If you are given a lab handout you may reference the materials and procedure. If you are not given a lab handout you must write your own materials and procedure section.
- Labeled diagrams may be included for an experiment showing the equipment used and the configuration of the apparatus.
- Safety rules from the Flinn Science Safety contract must be referenced.

### **LAB-WORK:**

- This section of the lab includes data and observations and will be collected during the lab.
- All data must have appropriate units and be written neatly into data tables.  
All data must have the appropriate number of significant figures according to the instrument being used to collect data.
- Detailed observations must be recorded for each part of the experiment.

### **POST-LAB WORK:**

This is the analysis section of the lab and is the section where you prove that you have understood the chemistry that was tested during the experiment.

### **Calculations:**

- Most labs will ask you to perform calculations from the collected data.
- For all calculations work must be shown, units must be used, and significant figure rules must be followed.
- When accepted values exist, you will be asked to perform a percent error calculation.

### **Data Analysis:**

- Most labs will ask you to answer questions regarding collected data and calculations.
- Questions must always be answered in complete sentences and answers must reference specific parts of the experiment or specific pieces of data.

### **CONCLUSION AND ABSTRACT:**

- When writing the conclusion & abstract:
  - o Always write in the past tense
    - Ex. The mass of the water was measured to be 5.0 g
  - o Never use pronouns ex. I, me, they, we, them, us, etc.
    - Ex. The density of the water was calculated as 1.2 g/mL
  - o Be as specific as possible with respect to results and calculations.
    - Always reference your calculations.
      - Ex. When alka-seltzer was added to water, a fizzing sound was heard.
    - Stay away from general statements.
      - Ex. The two things were added together and a funny sound was heard.
  - o To report results for more than one substance, use the term respectively in the following way.
    - Ex. The density of substance A, substance B, substance C, and substance D were found to be 3.4 g/mL, 2.0 g/mL, 0.9 g/mL, and 1 g/mL respectively.
      - Instead of having to write: The density of substance A was 3.4 g/mL. The density of substance B was .....

### **The wrong way to write a conclusion/abstract:**

- o "I put the beaker on the balance. The mass is 4.5 g."
  - This is incorrect because pronouns should not be used and tense needs to be past tense.

## **Conclusion:**

- A conclusion always involves three distinct pieces, each written in separate paragraphs.
  - o Paragraph #1:
    - Restate the hypothesis and include whether the hypothesis was accurate or not. Also, explain how the results of the lab show how the hypothesis was right or wrong.
  - o Paragraph #2:
    - Discuss any questionable data or results and any errors that occurred during the experiment.
    - If a percent error was calculated, then discuss how the percent error shows the accuracy of the data and how the procedure led to this error.
      - Human error does not count.
        - o For ex. Do not state: The mass of beaker was measured wrong.
      - Procedural error does count.
        - o For ex. The mass of the substance was too high since the substance was not heated for a long enough period of time.
  - o Paragraph #3:
    - Discuss what was learned by performing this lab. Include all chemistry vocabulary and make connections between concepts. Also, offer any suggestions for procedure modifications OR offer any additional experiments that could be performed to further test the purpose of the lab.

## **Abstract:**

The abstract is the last part of the lab to be completed but it is the first part of the lab that is read. The abstract presents an overview of the lab in the following format:

- o 1-2 sentences stating the purpose and how it was tested.
- o 1-2 sentences stating the results
- o 1-2 sentences stating the conclusion

Example abstract:

(on a separate sheet of paper, with a centered title)

### ABSTRACT

The purpose of the lab was to calculate the volume of water. This was done by using a graduated cylinder to measure volume in mL.

The volume of the water was reported to be 5.0 mL.

Volume is a measurement of the amount of space taken up by an object. The volume of a liquid can be measured using a graduated cylinder.