Lab "Notebook" Requirements

Laboratory notes are the most important evidence that a scientific investigation was completed and that the conclusions reached by the experimenters are supported by experimental observations and data. These requirements will guide you in keeping effective documentation of your work.

To get started:

1. Create a Google Drive Folder. Title it "Last name Chem SL (or HL) Labs." An example would be "Fitzgerald Chem SL Labs."
2. Share your folder with me, sbrookhart@g-cacegypt.org, and give me editing privileges.
3. Each experiment should include a Google Doc (in that folder) titled with your last name + name of the experiment. Example: "Fitzgerald Percent Composition."
4. Any Google Sheet analysis that you use should be similarly titled (your last name first) and be included in your folder, AND linked to in your Google Doc.

General Guidelines

1. Data that you collect should be entered directly into your Google Doc, not jotted on a piece of paper and then recorded.
2. All calculations should be shown. You are encouraged to neatly do your calculations by hand, take a picture, and paste the picture directly into your doc.
3. Chemical reactions MUST be formatted correctly, with subscripts, superscripts, and arrows.

The notebook entries for each experiment should be organized into labeled sections as explained below.

Before lab, complete these:

Title

Purpose (all experiments)

The **Purpose** section consists entirely of a one or two sentence explanation of the overall experimental goal and how you will achieve that goal. The statement should be as specific as possible. For example, it is too vague to merely write: "The objective is to find the density of an object." Instead, you might state: "The objective is to determine the density of a roughly cubic piece of wood by measuring its dimensions with a yardstick, and then measuring its mass."

Experimental Outline

Here you should include an outline of the main steps of the experiment. In some cases, it may be practical to put this in a flow chart format. It will take you some practice to be able to determine what belongs in the experimental outline. In your outline, you should also include all of the chemical reactions that you will perform.

Data Table

One of the most important things to be able to determine before the experiment starts is what data you will be recording. Make a table that will allow you to record all of your data. Units and uncertainty belong in column headers, where practical.

During lab:

Observations & Data

Record all qualitative observations (before and after!), with experimental context.

Record all quantitative data in your data table with the correct significant figures.

If something goes wrong, or you change a procedure, note that in this section as well.

After lab:

Results & Analysis

Observations and data can usually be summarized in a **Results** table that makes it convenient for you and your audience to understand the information. Of course, each column of a table must be labeled.

In nearly all general chemistry experiments, calculations are required to obtain the result. Calculations, including intermediate steps, are presented in the **Analysis** section. All variables in algebraic equations must be defined. In the case of multiple calculations that employ an identical mathematical strategy, one example calculation can be shown, if it is clearly labeled "Sample Calculation." As with nearly all numbers recorded and used by scientists and engineers, numbers shown in the **Calculations** section must include applicable units, uncertainty, and error propagation.

Conclusion/Evaluation

Directly refer to the **Purpose** by writing a brief description of your final result(s). Include a thorough discussion of possible systematic errors and their effect on your results.