

## Format for a Formal Lab Report

### General Instructions

The report must be typed and should be **double-spaced!** Your name and page numbers should be included on each page (as a header/footer). A formal report typically includes the following sections. Use headings to indicate the beginning of each section. (Those marked by an \* may not apply to all experiments.)

**\*\*GCC's Writing Center or Electronic Writing Center can help you proofread and edit your report\*\***  
<http://www.gc.maricopa.edu/English/writingcenter/>

**Title Page:** Include the following information on your title page:

**Title of Laboratory Experiment**

**Your Name**

**Course and Section Number**

**Instructor**

**Lab Partner(s) (if any)**

### Lab Report

**Purpose of the Experiment/Introduction:** This should be a brief statement explaining why the experiment was conducted. What was the main goal of the lab? What will you accomplish? This is generally a 2-3 sentence section.

**Materials:** List (not in sentence or paragraph form) all equipment (using the correct names) and chemicals used in the lab. List names and formulas (with appropriate subscripts!) of chemicals, include concentrations of solutions, indicate all glassware used (including sizes), and list any other materials needed to carry out the lab.

**Procedure:** Scientific lab reports are always written in the third person, past tense. For example, instead of saying, "I added 40 mL of water to the graduated cylinder," you should type, "Forty milliliters of water were added to the graduated cylinder." A brief outline of the procedure(s) you followed should be included. This entire section should be written in third person, past tense and should include enough information for someone else to repeat your procedure without having to read the lab handout. It is not acceptable to simply type the steps given in the lab handout. **That is plagiarism and will be assigned a grade of 0!!**

**Data and Results:** Data should be presented in a neat, tabular form. All tables should have a title and be labeled (Ex, Table 1: Results of Supernatant Tests). **All data should have units.** Tables must be typed. Balanced chemical equations should be included to show the reaction(s) used in the lab. Results of the experiment include (but are not limited to) descriptions of the reaction taking place and the observations of all materials, before during and after reactions take place.

**Calculations:** Any formulas used should be presented here – typed, not hand-written. One example equation with units should be shown for each **type** of calculation. The example shown below demonstrates the steps to show in the calculation of an average.

Average density from calculated method= (density 1 + density 2 + density 3 + density 4)/4

Average =  $(5.235 \text{ g/cm}^3 + 5.921 \text{ g/cm}^3 + 5.765 \text{ g/cm}^3 + 5.843 \text{ g/cm}^3)/4$

Average =  $5.691 \text{ g/cm}^3$

**\*Graphs:** This lab does not require one, but it is a standard part of many formal reports. Graphs should be presented with Graphical Analysis, Excel, or a similar graphing program. Graph title should be an accurate description of what is being plotted. *X*- and *y*-axes should be labeled to explain both the property plotted and its units.

**Analysis of Results/Discussion/Lab Questions:** This is the most important section of the lab report. This section should include a discussion of the concepts and theory behind the lab, why the experiment was conducted, and what chemical principles were used to determine results and outcomes of the experiment. Here, the observations and results are interpreted and the meaning of each result is explained.

You should have one or two sentences on each of the following:

- Reasons why your results may differ from what was expected - errors, difficulties in making observations or changes to the procedure.
  - Suggestions for improvements to the *Method*, or ideas for further investigation could be made.
- Any problems encountered in the experiment are listed along with any suggestions for improvement of the experiment. List and discuss ways to improve the lab so another chemist following your report could avoid your errors.

**Conclusion:** The conclusion should briefly address the purpose of the experiment and whether the intended outcomes were achieved or not. Be sure to discuss any significant results, include numerical results and compare your results to accepted values.

**Turn in the pages as described in the lab report instructions, in the specified order.**

**Common Lab Report Errors:**

- Use 3<sup>rd</sup> person, past tense when describing the lab procedures.
- Label and title tables.
- Use subscripts and superscripts where appropriate.
- Double check that all chemical equations are balanced!
- **Proofread** your report **at least** once before turning it in!!!
- Discuss the concepts behind the lab (theories, etc.) in the discussion.