

Science Lab Report Format

General Guidelines:

1. When you hand in your lab, ensure the parts are in order. If it is not in order, it makes it easy for teachers to miss sections, resulting in zeros ;)
2. Each individual section of the lab should allow the reader to be able to understand the complete lab as its own entity (for example: the reader should be able to know what you were doing by simply looking at your results or your hypothesis alone)
3. Ensure all graphs, diagrams, charts or notes have a descriptive title, and are presented with **straight, horizontal lines**
4. Refer to this lab report format, as well as the rubric while writing up all labs
5. Labs should be written in 3rd person and past tense

Title:

- Your name should be **underlined** on the **TOP RIGHT**
- Your partners' names should be *under* your name
- The date should be on the **TOP LEFT**
- The class (i.e. chem. 20) should be **below the date**
- The title should be in the center at the top of the page and should be a descriptive precise statement of what the lab will be
 - Experiment 6D: Determining the Limiting Reactant and Percent Yield in a Precipitation Reaction

Abstract:

- 5-7 sentences describing
 - purpose
 - how procedure addresses the problem / purpose
 - results
 - errors
- This section should be a full summary of the experiment

Background Information:

- Summary of prior information or what we've been learning in class (why this area is important to science and why we do the experiment)
- Explain the required information outlined within the lab outline (or discussed by your teacher)
- Minimum ½ page description
- Full sentences required, NO POINT FORM
- Detailed examples should include relevant formulas and discussion
- All background information should include relevant sources of all materials within the information, which can be referred to on the works cited section of the lab report

Problem / Objectives:

- A precise description of the objectives of the lab
- Can be taken directly from the lab
- If more than one, the objectives may be numbered for reference

Hypothesis:

- If (**manipulated variable**) then (**responding variable**) because (**explain the theory or reason behind your hypothesis**).
- If the hypothesis includes numbers, all work must be shown.

Variables:

- Contolled – what was kept the same in the lab – list minimum 5
- Manipulated – what you are changing in the lab
- Responding – observable change due to the manipulated variable – may be multiple
- The CONTROL Test – this is the test in which nothing is changed so to compare the effect of the manipulated variable (most common in biology)

Materials:

- A bulleted **list** of specific materials must be included
 - All concentrations should be included
 - Size of glassware should be included

Procedure:

- A detailed, numbered step by step procedure must include all measurements, concentrations and species
- Be sure to remember to make note of changes done during the procedure!

Diagrams:

- All diagrams should be HAND DRAWN using a ruler
- Labels should include measurements and concentrations when applicable
- Labels should be drawn with a straight, horizontal line to the side of the diagram (as discussed in the Appendix of the biology text book)
- Make diagram as detailed as possible
- All equipment should be included

Experimental Results (Data):

- Graphs should be titled, including the Responding and Manipulated Variable
- Table of evidence to demonstrate results (column headings should contain units)
- Data should contain no analysis on the qualitative information

	Trial 1	Trial 2	Trial 3	Trial 4
Initial Buret Reading (mL)				
Final Buret Reading (mL)				
Change (mL)				
Average (mL)		xxxxxx	xxxxxx	xxxxxx

- All other information from procedure, including precise measurements and readings should be recorded in this area in a neat list form
 - i.e. 32.4g of NaCl was used to create the solution with 25.2mL water
- Note any experimental error in this area
 - i.e. buret tip fell off during titration and therefore experimental results may be altered due to accidental (excessive) spill

Calculations:

- Show all knowns or given values and outline unknowns (provide detail of what you are calculating within your lab)
- Calculations must include all units, formulas and numbers used. These numbers should be available from the experimental results
- Balanced equations and significant digits should be used in calculations

Analysis of Results:

- Required calculations for the results of the experiment
- Questions in the lab procedures will be outlined most of the time
- Discussion of the relationship between the manipulated and responding variables is important in analyzing the lab data
 - Relate the graph to the formula
 - Relate the calculation to the concept
 - Discuss how a new test could be developed based on your results

Conclusion:

- Conclusion will be outlined in the lab in reference to the objectives
- State conclusion as "According to the evidence..."
- Where appropriate, detail the relationship between the variables
- Discuss whether your hypothesis was supported or disproved
- Suggest sources of error that may have influenced your results
- Conclusions should be paragraph form

Extension:

- Create a new lab that extends the test. Essentially, where can you go from this lab? What other variables could you test?
- Discuss where this lab could be used in every day life in detail. Explain the industrial process or biological application of this lab
- Explanation of a lab must be similar to an abstract of a new lab!

Evaluation:

- Calculate the % error of your experiment using the formula below
 - $\% \text{ error} = \frac{\text{theoretical value} - \text{experimental value}}{\text{theoretical value}} \times 100\%$

Appropriate %error is less than 30% in chemistry labs!

- Common sources of experimental error include BUT ARE NOT LIMITED TO...
 - conditions (ex. SATP) not controlled
 - impure reactants or products
 - any measurement process
 - incomplete reaction
 - judgment of color
 - loss of solid in filtration
 - incomplete drying of products
 - manipulative skill
- Discuss in detail how these errors may have influenced the results of the lab and therefore the discrepancy in your results
- Suggestions on how to improve the lab (reduce the error) should be included for each error mentioned (must be scientific based, not "be more careful")
- Minimum 3 sources of error for each lab must be included

Follow Up Questions:

- Answer the follow up questions outlined in the lab (often to prove understanding of the concepts learned and applied in the lab)
- This will be marked as "test style" questions

Sources

- Sources should be noted in APA or MLA format (if you are confused as to how to document this, there are plenty of APA or MLA format generators online)
- The sources used should be present within the lab report as well (i.e. in the background information or analysis)
- Sources should be numbered in alphabetical order
- Any editable website is not a valid source (i.e. wiki's, about.com, ask.com, answers.com)