

Lab Report Outline

Lab reports are worth 20% of your mark in this course. Ensure that they are completed and turned in on time.

Lab reports will be deducted 50% on the first day late and then score a zero on the second day unless a valid excuse is provided in writing (e.g., a medical reason.)

Lab reports will be collected at the beginning of class. Labs not handed in at the beginning of class are considered late.

You are encouraged to hand your lab reports in early for a “free evaluation”. Lab reports that are handed in early are scanned over quickly and marked with a pencil so that improvements can be made to your reports before the final copy is marked in pen.

Emphasis is placed on the accuracy of your data and the calculations leading to the final results in your report. As well, the way that the report is presented has a bearing on your mark. Hand-written assignments are acceptable, however word processing is preferred.

Since reports are written for the scientific community they must be clear and complete so that others (not just your teacher) can fully understand what you are reporting on, and the significance of the data that has been collected.

One lab per group of two is typical, but you may hand in your own write-up. A report submitted with more than two names on it is unacceptable!

Labs must be read before performing the experiment. If you do not understand any procedure(s), you are encouraged to ask your questions before the lab activity begins. In addition, rough data tables must be prepared before any experiment.

All lab reports will have the following format unless specified:

(Use the following list of subtitles as a checklist to ensure that your report is complete)

- Full name(s), date and block
- Title
- Objective
- Apparatus and Materials
- Procedures
- Observations
- Sources of error
- Questions and calculations
- Follow-up questions
- Conclusions
- Graphs
- Rough data

Names: Write these in the upper right-hand corner of your report. If you are writing your own report, **DO NOT** include your lab partner's name.

Title: An appropriate title for your lab is not necessarily the one from the lab manual. Titles to lab reports need to be meaningful and concise. In addition, a lab code must be included.

e.g., "Lab 22G" is not an appropriate title.

e.g., "Temperature vs reaction rate" is not an appropriate title.

e.g., "The effect of temperature on the reaction rate between sodium chloride and lead (II) nitrate. Lab 22G" **IS** an appropriate title.

NOTE: All titles (including reference titles) and subtitles must be underlined.

Objectives: Simply copy these from the lab manual. Objectives that are not covered in the experiment do not need to be included.

Apparatus and Materials: Simply type the following statement in quotes and include the appropriate page numbers.

"Refer to the Heath Laboratory Manual pages ____ - ____."

Procedures: Complete a reference including the appropriate page numbers.

"Refer to the Heath Laboratory Manual pages ____ - ____."

Observations: Include both qualitative and quantitative data.

Quantitative data **MUST** always be included in a data table. If the book does not provide an example for you, you are expected to design your own table. Each table must include a table caption at the top of the table. The table caption is the title for the table.

Qualitative data **MUST** be included underneath the appropriate data table and may be listed in point form.

e.g., Table 1. The effect of an acid catalyst on the reaction rate (mol/L·s) between potassium permanganate and a piece of copper metal.

Without acid catalyst	15.77 mol/L·s
With acid catalyst	55.98 mol/L·s

- The purple colour of the KMnO₄ turns colourless during the reaction.
- The copper metal dissolves during the reaction.

When graphs are used to represent data, they should be stapled to the back of your report just before the rough data. A reference to a specific “figure” in your question set should be given so the reader can find the graph easily. Figure captions are written at the BOTTOM of the graph. The figure caption is the title for a graph or diagram.

Sources of Error: Simply include the systematic errors (i.e., measurement errors) in point form.

e.g., 10.00 mL graduated cylinder +/- 0.02 mL

e.g., digital balance +/- 0.01 g

Note: a proper entry includes the name of the instrument, the reading error (i.e., the +/- value), the units and, when available, the size of the instrument.

Random errors such as ambient temperature, pressure, humidity, light and the phase of the moon will **NOT** be included.

Do not include human blunders! If you are aware that you have made a mistake, then repeat the experiment again.

Questions and Calculations:

All questions **MUST** be answered in sentence form to fully communicate the solution to the question. For questions that involve calculations, write a sentence answer referring the reader to the sample calculation “below” and then show the work for the calculated answer with appropriate units.

e.g., The molar concentration of Co⁺² after dilution was determined using the calculation below.

$$C_i V_i = C_f V_f$$

$$(5.0\text{M})(1.0\text{L}) = C_f (2.0\text{L})$$

$$C_f = 2.5\text{M} = [\text{Co}^{+2}]$$

Note: For questions that require you to repeat the same calculation many times, you need only show your work for the first calculation and list the remaining values.

Follow-up Questions: The same guidelines as “questions and calculations apply here.

Conclusions: Answer the objectives to the lab using full sentence answers. It is helpful to think of the objectives like questions and then simply answer them here. **DO NOT** list procedures here!

Additional Notes:

Do not use the following terms in these reports: I, me, you, us, we, and they.

Format your labs according to the bulleted list on page 1 of this outline.

Always include the rough data as the last page of the report.

Do not wait to the last minute to ask questions about the lab write-up.