

GRCI Formal Laboratory Report ... "How To" Guide

Laboratory exercises demonstrate to you that scientific fact is both observable and repeatable. They emphasize the necessity of carefully observing, both qualitative and quantitative. Laboratory reports provide an opportunity to develop skills in: initiating and planning; performing and recording; analyzing and interpreting; and accurately communicating.

General Guidelines for Writing Laboratory Reports

- Always write in the third person impersonal. This means avoid the use of "I", "We", "You", "He", "She", or "They".

e.g. Instead of writing: "We heated the water using a Bunsen burner", write: "The water was heated using a Bunsen burner".

- Always write complete sentences. You may use point form, phrases or single words when writing in charts, tables, or on diagrams.

Title Page of the Experiment

- The title of the lab report is placed in the centre towards the top of your page. Put your name, your partner(s) name, teacher's name, due date, and class period in the lower left hand corner.

Purpose

- The purpose contains one or two sentences in which you describe why you are doing the experimental investigation.
- Ask yourself the question: "What was I trying to find out in the experiment?"
- A good guideline is to include the phrase: "The purpose of this experiment was to investigate the effect of _____ (a modifiable variable) upon the _____ (a measureable variable).

Hypothesis (**Not required in Grade 11 Chemistry)

- This is your educated guess about what you think will occur in the investigation and why. Remember to use the format: **If**, **then**..... **because**

e.g. If a marble is dropped in liquids with different viscosity, then the marble will travel slower in the more viscous liquid because there is more resistance to flow.

Apparatus/Materials

- This is a list of the pieces of equipment and chemicals used in the experiment.
- Your materials should be organized in list form (columns).
- If doing an experiment from a textbook or handout, **DO NOT REWRITE** the materials. Write the following:

*e.g. Please refer to pages ____ to ____ in the text (Nelson Science 9) OR
Please refer to the handout for the lab. Be sure to state the title of the lab.*

- Make sure to mention any changes made to the materials if using different ones than the textbook/lab handout recommends.

*e.g. Please note the following changes to Materials:
150 mL beaker was used instead of 100 mL beaker.*

Procedure

- The procedure is written in numbered steps using **past tense**. It is the “instruction manual” for how to conduct your experiment.
- Photographs or diagrams may be used to help describe the experimental setup.
- If doing an experiment from a textbook or handout, **DO NOT REWRITE** the procedure.

Write the following:

*e.g. Please refer to pages ____ to ____ in the text (specify which textbook) OR
Please refer to the handout for the lab. Be sure to state the title of the lab.*

- Make sure to mention any changes made to the Procedure:
e.g. Please note the following changes to the Procedure: Omit step 6 in the procedure

Observations

- Observations can be qualitative, and/or quantitative. They are the detailed notes taken as the experiment was performed. It is important to stick to the facts as they have been observed.
- Observations are best completed in table format. (*Please include units of measurements*)
- If you are expected to draw what you see, those diagrams are included in the Observation section.

Analysis/Calculations (**Not required in Grade 9)

- Always show all equations/formulas that you use.
- For repeated calculations, only one sample calculation is all that is needed.
- Calculations must include the units of measurement (significant figures when necessary).

Discussion/Interpretation (**Analysis Questions)

- Explain what happened in the experiment by answering questions in full sentences.
- See written guidelines regarding impersonal tense and full sentences.

Conclusion

- It is a **brief summary** of what was discovered.
- This section often begins by making a statement as to whether the findings in the observations support or do not support the expected findings stated in the hypothesis. It's important to make such a comparison because returning to the hypothesis is crucial to basic scientific thinking.
- Explain why the hypothesis was or was not supported by the data. It is acceptable to reject your hypothesis as long as you can explain why the results did not turn out as predicted.

Percent Error (**Not required in Grade 9)

- Several senior science labs are quantitative. When appropriate, the percent error is calculated using the following formula:

$$\% \text{ Error} = \frac{\text{Lab Results} - \text{Theoretical Value}}{\text{Theoretical Value}} \times 100$$

Sources of Error

- Sources of error are parts of the experiment that may have caused the results to be less than perfect.
- A properly stated source of error must give the cause of the error and then state the effect that error has on the measurement. State the evidence for the error you claim.
- Sources of error are those parts of the experiment that a scientist tries to improve in subsequent experiments. It is a description of how and why the procedure could be changed to make the investigation more accurate.

Works Cited

- Include a works cited page and cite all sources used throughout your report, following proper citing guidelines.