GRCI SCIENCE
Formal Laboratory Report ..... Graphic Organizer

Title Page of the Experiment

- The title of the lab report is placed in the centre towards the middle of your page.
- Put your name and your partner(s) name a few spaces below it.
- Write your course code, teacher's name and date of submission in the center towards the bottom of the page.

Title of Lab

Student Name
Lab partners names

Course code
Teacher's name
Date of submission

Purpose

- The purpose contains one or two sentences in which you describe why you are doing the experimental investigation.
- A good guideline is to include the phrase "The purpose of this experiment was to investigate the effect of _____ (independent variable) upon the _____(dependent variable)

Hypothesis

- This is your educated statement or guess, predicting what you think will occur in the investigation.
- If your investigation involves a "cause and effect" relationship, use an ***If … then...*** statement as your hypothesis. Otherwise, be as specific as possible in what you believe will happen in your investigation.
- Depending on the nature of your investigation, you may or may not have a hypothesis. (see your teacher for further clarification if necessary)

Apparatus/Materials

- This is a list of the pieces of equipment and chemicals used in the experiment.
- Your materials should be organized in columns.

Materials:

Test tube	Crucible
Glass rod	Retort stand
Ring clamp	Bunsen burner
1% NaOH	5% HCl
…….	…….

Procedure

- The procedure is written in numbered steps using **past third person impersonal 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**. 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

~~We will~~ pour 3mL of 5% HCl into the test tube.

3mL of 5% HCl was poured into the test tube. ✔

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. All units (metric system) need to be included only at the top of each column.
- Labelled diagrams are included in this section. All diagrams should be in pencil. Colour may be used depending on the experiment.

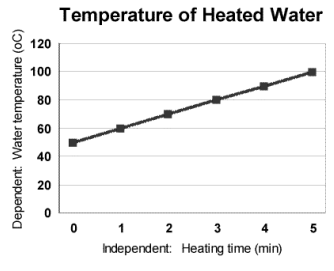
Observations:

Trial	Length (cm)	Width (cm)	Area (cm^2)
1	2	3	6
2	1.5	2.8	4.2
3	1.8	3	5.2
Average	-	-	5.4

Analysis / Calculations

- Always show all equations/formulas that you use.
- For repeated calculations only one sample of the calculation is needed.
- Calculations must include the units of measurement (significant figures when necessary).
- If you have analyzed your data in the form of a graph, the graph is included in this section.
- When graphing results the dependent variable is always plotted on the Y axis and the independent variable is plotted on the X axis.
- Graphs should include a proper title, labeled axis including correct units and legends when necessary.

Analysis:



Discussion / Interpretation

- Explain what happened in the experiment by answering questions in **full sentences** and in **past third person impersonal tense**.

Conclusion

- It is a **brief summary** of what was discovered from the experiment.
- Compare your observations to your hypothesis and state whether your observations support your hypothesis.
- 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

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

$$\% \text{ Error} = \frac{(\text{Calculated value} - \text{Theoretical value})}{\text{Theoretical Value}} \times 100$$

Sources of Error

- Sources of error are those parts of the experiment that could be changed to make the investigation more accurate.
- State the sources of error, cause of the error, evidence of the error and the effect the error has on the experiment.

Sources of error:

- Error
- Cause of error
- Evidence of error
- Effect of error

References

- Cite all sources used throughout your report following the CSE guidelines.

REFERENCES

Eisenberg Michael & Berkowitz B. [Internet]. The Big6; 2012 [modified 2012 Mar 12, cited 2012 Mar 17]. Available from: http://www.big6.com/.

Gardner H. 1993. Frames of mind: The theory of multiple intelligences. New York: Basic Books. 125.

GRCI LAB REPORT SUCCESS CRITERIA

Category	Level 4 (80-100%)	Level 3 (70%-80%)	Level 2 (60%-70%)	Level 1 (50%-60%)
Language Usage	• Uses past, impersonal tense • No errors in grammar or spelling • Uses complete sentences	• Uses past, impersonal tense • Few errors in grammar or spelling • Uses complete sentences	• Inconsistent usage of past, impersonal tense • Several errors in grammar or spelling • Inconsistent use of complete sentences	• Rarely uses past, impersonal tense • Many errors in grammar and spelling • Rarely uses complete sentences
Title Page	• Title centered middle of page followed by your name and then your partner's names • Course code, teacher's name, due date and class period centered at the bottom of the page	• 1 criterion missing from level 4	• 2 or more criteria missing from level 4	• 3 or more criteria missing from level 4
Purpose	• Purpose is clearly identified; relevant variables are described	• Purpose is identified; relevant variables are described in an unclear manner	• Purpose is vague, relevant variables are not described	• Purpose is not identified; relevant variables are not described
Hypothesis	• Predicted results and hypothesized relationship between variables clearly stated and reasonable	• Predicted results and hypothesized relationship between variables is reasonable, but unclear	• Predicted results and hypothesized relationship between variables unreasonable and unclear	• Predicted results and hypothesized relationship between variables do not relate to experiment
Apparatus/ Materials	• All necessary materials listed in an organized manner **or** complete text/handout reference with any changes included	• All necessary materials listed in an organized manner **or** text/handout reference included • Changes excluded	• Most materials listed **or** text/handout reference included • Changes excluded	• Few materials listed **or** text/handout reference included • Changes excluded
Procedure	• All necessary steps listed in order; neat diagrams included to describe set-up **or** complete text/hand-out reference with any changes included	• All necessary steps listed in order; neat diagrams included to describe set-up **or** complete text/hand-out reference • Changes excluded	• Most necessary steps listed in order; diagrams included to describe set-up **or** text/hand-out reference • Changes excluded	• Few steps listed; diagrams included to describe set-up **or** text/hand-out reference • Changes excluded
Observations	• Representation of the data using tables and/or diagrams is accurate, clear and concise	• Representation of the data using tables and/or diagrams is mostly accurate, clear and concise	• Representation of the data using tables and/or diagrams is somewhat accurate, clear and concise	• Representation of the data using tables and/or diagrams is rarely accurate, clear and/or concise
Analysis/ Calculations	• All equations included • For each formula, one sample calculation with correct units and significant figures is included • Graphs are accurate; labeled and titled correctly	• All equations included • Most sample calculations with correct units and significant figures are included • Graphs are accurate; labeled and titled correctly	• Most equations included • Some sample calculations with correct units are included • Graphs are inaccurate; labeled and titled incorrectly	• Few equations included • Few sample calculations with correct units are included. • Graphs are inaccurate and sloppy; labeled and titled incorrectly
Discussion/ Interpretation	• All questions answered correctly with accurate explanations reflecting observations	• All questions answered with few inaccuracies	• Most questions answered with several inaccuracies.	• Few questions answered with many inaccuracies.
Conclusion	• Clearly and concisely summarizes results • Includes insightful and logical explanations verifying or refuting the hypothesis	• Clearly and concisely summarizes results Includes logical explanations verifying or refuting the hypothesis	• Summarizes results Includes explanations relating to hypothesis	• Summarizes results poorly • Explanations do not relate to the hypothesis
Sources of Error	• All experimental errors are identified; their effect and ways to reduce errors are discussed in depth	• Most experimental errors are identified; their effect and ways to reduce errors are discussed	• Some experimental errors are identified; their effect and ways to reduce errors are poorly discussed	• Few experimental errors are identified; their effect and ways to reduce errors are not discussed
Works Cited	• Reference page included • Consistently follows CSE format • Sources provided throughout text	• Reference page included • Follows CSE format with few errors • Most sources provided throughout text	• Reference page included • Follows CSE format with several errors • Few sources provided throughout text	• Reference page included • Did not follow CSE format • Sources are not provided throughout the text of the report