

Science Writing

There are two major forms of science writing which you may be required to complete in your science classes – the formal lab report and the scientific research paper

Guidelines for Writing a Formal Lab Report

- Should be done in blue or black ink. The lab report can be typed up in black ink.
- Each student will write up his/her own lab report.
- The lab report should be done neatly and easy to read

1) COVER PAGE

- Put the Title of the Lab and underline it
- Put your Name and Due Date below the title
- List you Lab Partners below your name and the due date.

2) LAB WRITE-UP

- If typed, use blank paper (not lined); if written, use lined paper
- The lab write-up should be printed, handwritten or typed neatly
- Must include ALL of the following headings (which are underlined)

Problem: (Purpose / Question)

- Write down the purpose of the lab; what you are trying to determine in one sentence
- Can be written as a question
- Sometimes this is given to you by the teacher

Hypothesis:

- This is an educated guess as to what you think is the possible reason or relationship
- This is NOT a question, but a statement that includes what your prediction is based on what is happening
- This can be true or not. You do NOT have to be correct, but it should be your best guess as to what you think will happen
- Eg. If I mix blue paint with red paint, I will get white paint

Variables:

- List your Dependent, Independent, and Controlled Variable for the experiment
- Underline the variable sub headings:
- Independent – the one factor that you are changing (to see if this is cause)
- Dependent– the one factor that you are measuring or recording
- Controlled – a list of factors that you are keeping the same throughout the experiment

Materials:

- List ALL the materials that will be used in the experiment
- If materials are listed on a lab handout, you may refer to it as “See page ###of the _____ lab handout.”

Procedure:

- Write down step by step instructions in order to perform the experiment
- Number each step separately (like a recipe)
- If the directions are on a lab handout, you may refer to it as “See page ### of the _____ lab handout.”

Observations:

- This is the recording of data or information gathered while doing the experiment
- It can be done as notes, charts, graphs, sketches or recordings of the experiment

Analysis: (Discussion / Questions)

- After gathering the data, this is the section for finding out what happened and making some correlations as to what happened and possibly why.
- This will include answering questions about the experiment or interpreting the results

- Up to this point, the information in the lab report can be similar with your group members, but NOT copied or printed out for one another
- Each student is responsible for understanding the experiment and the results, so make sure you know what was going on
- List any inconsistencies that may have affected the experiment
- List at least two possible reasons. If “human error” is one of your errors, be specific about what “human error” was made. For example, measuring out 10.0 mL of solution and spilling some of it on the lab bench instead of combining it with another chemical would be a specific “human error”.

Conclusion:

- This is written as a small paragraph that will answer the Purpose of the experiment
- First state whether or not your hypothesis was correct
- Secondly, prove or disprove your first sentence with the results or actual data
- Eg. Our hypothesis was incorrect. Red and blue paint did not make white paint. Our results showed that red and blue paint made purple paint.

Modified from

http://schools.cbe.ab.ca/b631/Science%20Web%20Page/Grade%209%20Science%20Web%20Page_files/9%20How%20To%20Write%20Up%20A%20Lab; accessed 12.1.14)

Additional resource:

<http://writingcenter.unc.edu/handouts/scientific-reports/>

Guidelines for Writing a Scientific Research Paper

The typical components of a scientific research paper are: Title, Abstract, Introduction, Methods, Results, Discussion, Works Cited, and Appendices.

Title: Should be informative, specific, and concise.

Poor title: **The impact of growth factors on cell signaling**

Better Title: **TGF- β inhibits the platelet-derived growth factor-induced formation of inositol trisphosphate in MG-63 human osteosarcoma cells**

Abstract: A summary of your whole report in 100 words or less. The abstract helps the reader decide whether or not to read the whole paper. It's like a movie trailer, but it includes the spoilers!

Introduction: A one page summary describing the relevance of your research and a short history of what is known about that topic. How does your work relate to work done by others? What is your research question? Why should the reader care?

Methods: This section describes the experimental procedures including techniques and analytical tools. Unlike in a formal lab report, materials are not listed as a separate section. This should NOT be a list of steps. It should be in paragraph format and describe in detail what was done and how it was done.

Results: What happened in your experiment? Don't interpret or explain any of your findings – just present data in the form of tables, graphs, charts, etc. Integrate the visuals with the text of your findings.

Discussion: The section is for interpretation of your results. Evaluate, analyze, and explain the significance and implications of your work. Draw generalizations, where appropriate. Explain limitations of your work and indicate future research opportunities. Explain how your results jibe (or don't) with other research. Give explanations for data that does not "fit" with what others have seen.

Works Cited: Use the format that your teacher requires. Be sure to cite EVERYTHING that this not your work. Even images and pictures need references, if you didn't create them yourself.

Appendices: This section includes the original data taken during your research. Each appendix should be numbered.

General Tips: Research reports should be written in passive voice whenever possible. Keep it simple. Avoid the use of "it", "very", and "really". Use 12 point, Times New Roman (or some other simple) font and standard margins. Number the pages.

modified from: <https://facultystaff.richmond.edu/~ggilfoyl/intermediate/writing.pdf>; accessed 12.1.14

Additional resources:

http://www.macmillanhighered.com/Catalog/uploadedFiles/Content/Worth/Custom_Solutions/Psychology_ForeWords/Marek_Ch04_APASTyle_Color.pdf

http://www.itc.nl/library/papers/hengl_rules.pdf