MONMOUTH UNIVERSITY
TUTORING & WRITING SERVICES

Biology Lab Report

BY 110-01: Scientific Method Lab Report

Please read over the following criteria to guide you in writing the lab report. Refer to Jan A. Pechenik's *A Short Guide to Writing About Biology* for additional assistance as well.

General:

- Must be typed, double-spaced, standard margins, standard white paper.
- No collaboration with anyone. This means that you may discuss your lab report with others, but you are to ensure that no part of the lab report is plagiarized from anyone else.
- No plagiarism from an outside source. Information taken from an outside source (any source other than your brain) must be paraphrased and cited. Do NOT copy word for word from any source.
- REMEMBER: ACADEMIC DISHONESTY WILL RESULT IN FAILURE FOR THE COURSE! (ALSO PLEASE NOTE: ELECTRONIC COPIES OF PREVIOUS SEMESTERS' LAB REPORTS ARE KEPT ON FILE AND WILL BE COMPARED WITH THIS SEMESTER'S LAB REPORTS!)
- Make sure you are clear and concise. A lab report is not the place for flowery prose. However, all information must be presented in paragraph form, not outline or bulleted form.
- Throughout your report, write in proper scientific language.
- Use the correct abbreviations.
- Learn how to add superscripts/subscripts, appropriate symbols, and Greek characters (i.e., m) on the computer.
- It is appropriate to use digits in scientific papers instead of spelling out numbers.
- Write numbers with the correct spacing and format: 3 ml NOT 3mL or 3ml or three ml or 3 milliliters.
- ALL parts of the report should be in 3rd person, past tense, passive voice.
    - For example: The goldfish were placed into 21ºC water.
    - NOT: I placed the goldfish into 21ºC water.
    - You should not have any "I," "you," "we," or "our" in your paper.

Format:

Title Page

- The title of the lab report, your name, names of group members, date due, course code, the following statement: "I certify that this work is solely my own, and any outside source was paraphrased and properly cited," and your signature.

Choosing a Title

- The title should consist of a few well-chosen words indicating the subject of the report. "Well-chosen" means that the title reflects the scope of your report accurately and is not too broad. Do not simply state "cell division" if you were studying the effect of vitamin B12 on the rate of cell division of human skin cells grown in culture. Also, avoid "cute" titles – keep the title professional .

Introduction

- The Introduction, Methods, Results and Discussion should all be connected but separated by the titles of the section. In other words, each section should not have its own separate page. However, there should be a title (in bold, underline or larger font) for each section that separates one section from another.

- The Introduction of the lab report should be an overview of the problem which was studied. give background material on the experiment that you performed. You will need to consult outside sources to find the information necessary to provide the background (start with your biology text).

- Report your hypothesis in a paragraph at or near the end of the introduction. Use the hypothesis you formulated before you came into lab. NOTE: make sure you write everything in past tense.

- A good introduction should be approximately 1 page in length, double-spaced. All outside work should be cited in the text by placing the name of the author and the date of the work cited immediately behind the sentence.

- Be careful NOT to do the following:
    - State your results (all results should be in the "Results" section)
    - Put methods/materials in the introduction (these should all be in the "Materials/ Methods" section)

Methods

- The Materials and Methods section should be written entirely in paragraph form (not as a list), and should be given in enough detail that someone could repeat the work. The entire report, including the Materials and Methods, should be written in the 3rd person, past tense, passive voice. For example:
    - One goldfish was placed into room temperature water.

- Correctly write the genus-species names of any organism: the first letter of the genus should be capitalized, and the species name should be in italics. For example:
    - *Homo sapiens*
    - *Canis lupus*

- Include concentrations of chemicals used, and be sure to include appropriate units of measurement. Do NOT include the rationale for your work in this section (that would be more appropriate for an "introduction").
- For more information, see: *A Short Guide to Writing about Biology* by Pechenik, pages 165 – 171.

Results

- Report the results that you have found (not what you *think* you should have found). Results can be given in the form of tables or figures (graphs or drawings) – be sure that each table and figure is numbered and given a title.

- In addition to tables and figures, the results section should have a brief paragraph in which you give the results in written form. Do NOT EXPLAIN the results in this section, just report them. The written description should simply summarize the results illustrated in graphs and figures. This written description should point out trends, but should not include explanations or opinions. Do not use the phrase "these results were significant" unless you have done statistical analysis to prove that they are statistically different.
- For more information, see *A Short Guide to Writing about Biology* by Pechenik, pages 171 - 206.

Discussion

- The Discussion section should contain your interpretations of the data, and should relate them to the question/hypothesis that was posed in the introduction.
- Be careful to avoid making this section just a repetition of the introduction section. If you have any data to explain away, do it here or make a new hypothesis as to why the results came out in a way you did not expect. Did the results answer your question? Draw some conclusions, supporting them with your data.
- What is the significance of your results in the general area that you studied? What are the main principles demonstrated by your results? What further experiments should be performed to clear up discrepancies or ambiguities in your results? How might your work be best continued or extended? Please be sure to appropriately cite references used as supporting information in your discussion section.
- For more information, see Pechenick's *A Short Guide to Writing about Biology*: p. 207 – 215.

Conclusion

- Conclude your lab report with a paragraph or two wrapping up the whole report. Are there any other experiments you might want to try in the future (hypothetically) that would resolve unanswered questions or further your knowledge? Did everything go as expected? Would you change anything about the experimental protocol (methods)?

Literature Cited

- Refer to Pechenik's *A Short Guide to Writing About Biology*.

Tables and Figures

- Use Excel or another software package to plot data.
- Tables and figures do NOT get titles. Rather, you need to write a detailed caption describing what the table or figure tells the reader. See a scientific journal article (like the one you chose for your presentation) to give you a better idea of what a caption should be like. Captions for tables go above the table; captions for figures go below the figure.
- Tables and figures are to be numbered separately (Table 1, Table 2, Table 3; Figure 1, Figure 2, Figure 3).
- Tables and Figures, although mentioned in the Results and Discussion sections, are to go at the end of the paper, after the Conclusion and Literature Cited. Each table or figure is to be put on its own piece of paper.

Common mistakes in the writing of MCB lab reports:

- Numbers and units of measure not written appropriately:
  - All numbers beginning with a "decimal" should have a "0" preceding them: 0.25 ml - NOT .25 ml
  - Appropriate Greek symbols should be used: 50 µl - NOT 50 ul, NOT 50 microliters

- Reports should be written in the 3rd person, past tense, passive voice:
  - "The DNA pellets were resuspended in 50 ml of TE."
  - NOT: I added 50 µl of TE to the pellet and resuspended the DNA.

- The OBJECTIVE and the CONCLUSION should be in full sentences.

- Do not use "bp" as a noun:
  - The DNA fragment was the appropriate size (5300 bp).
  - NOT: The band was the correct bp.
  - In addition, the book tends to capitalize BP – this is NOT the standard way of writing this, so please use "bp".

- Do not give too much detail that is ASSUMED. For example, do not mention that tubes were labeled, supplies were cleaned, or that pipettes were opened in a sterile fashion – we assume that this had to happen!

- Be careful about the wording of the reports – after the report is written, put it down for a few hours and proofread it later. Make sure that you write with enough clarity that someone unfamiliar with the report could understand it.
  - For example: Three fragments appeared in lane 1. Fragments do not "appear".
  - Better: Lane 1 contains three bands resulting from the digestion of l DNA with Not1.
  - Another example: Recombinant plasmid grew on LB plates.
  - Keep in mind that "plasmid" is DNA – it is not "alive" and cannot grow.
  - Better: Bacteria transformed with recombinant plasmid survived on LB plates.