



Laboratory Notebook Guidelines

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Recommendations for Keeping a Laboratory Notebook

(Adapted from NIH Office of Education publication)

The scientific method requires that meticulous records be kept. Keeping an accurate and up-to-date laboratory notebook is as important as the actual performance of the experiments. If a lab report is missing or incomplete, the entire experiment may have to be repeated.

Another essential component of a successful experiment is advance preparation. Preparations for the experiment include reading and writing protocols, making up reagents and solutions, and procuring necessary materials.

For each experiment, the laboratory notebook should contain the following:

1. A written purpose or objective of the experiment.

Example: "The objective of this experiment is to develop a basic understanding of electrohoretic theory, and to gain "hands-on" familiarity with the procedures involved in agarose gel electrophoresis to separate different molecules."

2. Flow chart of all materials, methods and protocols used in the experiment. Preparing a flow chart will enable you to check off steps in the protocol as they are done, and to check off reagents as they are added to the tubes.

3. Observations and mistakes. Noting observations and mistakes as the experiment is being conducted allows for better analysis - particularly in the case of unusual or unexpected results.

Example: "After twenty minutes of electrophoresis, I noticed that different colored dyes moved at different rates and in different directions through the agarose gel."

4. Results. The statement of results should be concise and factual.

Example: "The electrophoresis of different colored dyes (molecules) resulted in different migration distances and directions through the agarose gel."

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Recommendations for Keeping a Laboratory Notebook, continued

5. **Interpretation of results and conclusions.** It is important to be aware of the difference between "results" and "interpretation of results and conclusions". Results are statements of the facts. Interpretations and conclusions are logical statements that can be made on the basis of actual data. Explain what you did and your results.

Example: "I interpret the results to mean that the molecules in Lanes 1 through 6 had a negative charge and Lane 6 also had a positively charged molecule. I interpret the results to mean that Lane 5 was a dye mixture of the molecules found in Lanes 1, 2, 3, and 4. I interpret the results to mean that the dye molecule in Lane 1 was the smallest sized molecule."

6. **Discussion.** This shows a knowledge or understanding of the background information in relation to the results and conclusions.
7. **Answers to Study Questions.** Put the answers in your own words. Be sure that you understand the answers.
8. **Possible and/or Actual Sources of Error.** Note any actual sources of error that occurred or any possible sources of error that may occur in the experiment. These do not need to be in paragraph form but instead may be written as a list.

Distance migrated (cm)	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
-1.2						Blue 2
.5				Blue	Blue	Blue 1
1.0			Red		Red	
1.2		Purple			Purple	
1.5	Orange				Orange	

OTHER NOTES:

- Make sure the experiment number is written at the top of every page.
- In many cases, results should be in a table format.

Example of a data table at left. Band migrations are placed relative to each other for easy comparison.

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