

Lab Procedures

Timeline

Before lab:

I will give you the lab procedure and background information. You will prepare the following sections before the lab day: Purpose, Apparatus, and Procedure. These will become the first three sections of your final lab report.

Day of lab:

- Arrive with the lab procedure read.
- Bring the first three sections of your report: Purpose, Theory, and Hypothesis.
- A short quiz on the lab procedure may be given, covering the purpose, apparatus, and procedure.
- Write a few sentences predicting what you think will happen in the lab. Your predictions don't need to be correct, but they must show thought.
- I will sign your predictions during the lab. If you leave without them signed, you will lose those points.

Announced date after lab:

- The lab report is due.
- Late reports lose 10% per day.

Formal Lab Report Format

Name: (Your name first, then lab partners' names)

Class: _____

Date: _____

Dr. Croom

Lab Name

Purpose:

A short paragraph describing the problem being studied and the objectives of the experiment. State the scenario you are modeling without listing procedures. Clearly explain your goals and what you expect to learn.

Theory:

This is the main body of your paper. Write in paragraph form about the scientific background of your lab. Define important terms, explain the concepts that connect to the lab, describe what the theory predicts should happen, and provide relevant history.

Do not try to rewrite the laws of physics. The theory should be based on accepted scientific understanding. If your results seem to challenge theory, explain this later in the Results section.

Hypothesis:

A short paragraph predicting what kind of results you expect. The hypothesis should be measurable. Be as specific as possible, we are practicing the scientific method.

Materials:

List all items used in the experiment. If this is the first time using certain equipment, describe it, include a drawing or computer-generated image, and explain how it works. Cite any images or descriptions you did not create yourself.

Procedure:

List the steps you followed to collect data. Do not copy directly from the lab sheet; instead, write what you actually did in the order you did it. Be clear enough that someone else could repeat your experiment using your description.

Data:

Include charts, graphs, and tables of your collected data. Label each (e.g., "Data Table 5-2") for easy reference. Graphs should be neat, labeled, and scaled clearly. Follow the data and graphing guidelines provided by your instructor.

Calculations:

Show one full example of each type of calculation performed on your data. Include all steps. For example:

Total Normal Force

= Total mass of block (kg) \times acceleration due to gravity (m/s^2) \times sin(angle in radians)

= $0.4136 \text{ kg} (\pm \text{error}) \times 9.80 \text{ m/s}^2 \times \sin(\pi/2 \pm \text{error})$

= $4.05 \text{ N} (\pm \text{propagated error})$

Error Analysis:

Explain possible sources of error in your data. If your results differ by more than 5% from expected values, discuss what acceptable values should have been.

Results:

Interpret your data in paragraph form, supported by the theory you described earlier. Explain what your data shows and why it is significant. This may take one or two paragraphs.

In a new paragraph, describe anything unusual about your data. For example:

If theory predicts that a ball and a feather fall at the same rate, but your data did not show this, discuss whether it was experimental error or if you might have observed something unexpected.

If your results are fully consistent with theory, state:

“There is nothing unusual about these results; they are fully explained by the theory section.”

If some results are not explained by theory but can be supported by physical principles, explain them here with references.

Finally, pose new questions that could be investigated if the lab were repeated.

Note: If results don't match theory and you fail to discuss them here (in Results, Error Analysis, or Questions), points will be deducted.

Questions:

Answer any questions from the lab handout that were not already addressed. Preferably, answer them within the relevant sections of your report and mark them with [Q1], [Q2], etc. If all post-lab questions are answered elsewhere, omit this section.

Conclusion:

Evaluate what you learned from the lab. Mention what you found interesting, what was new to you, and what you took away from the experience.

Bibliography:

Cite all references.

placed on this page.