

## Pre-lab Assignment/Quiz

Allow at least an hour for completing pre-lab activities that include reading, video and Pre-lab Quiz. This Assignment/Quiz ensures that you understand the handout well enough to begin lab work. This covers basic content and experimental lab procedures.

## Lab Notebook and Notebook Pages

The bound, non-spiral **lab notebook** is the only place to keep written class material: pre-lab notes, lab lecture notes, data collection, experimental problems and solutions, error analysis, etc. (NO notes on gloves, scrap paper, or disruptively calling out data to your lab partner!). Lab notes should be clear enough to repeat your experiment, and by 4:50, every person should have their original data in their lab notebook. Making thorough notes also facilitates the write-up procedure and helps you become established as a working chemist. **The following practices are strongly recommended:**

- Table of Contents and numbered pages
- Titles/Activity: date and title of major activity on each page, with any appropriate subtitles. Describe what was done, along with any data/units.
- Observations: all relevant observations should be noted.
- Reference to external sources: lab writeup, lecture notes, journal article, conversing with instructor or another lab group, etc.
- When in doubt, leave space.

The Notebook Page can be a draft of your Experimental and Raw Data sections for the Lab Report, organized ideally on one page of the notebook: roughly half the page for experimental draft, the other half for organized raw data. This format is one suggestion; ultimately, the **Notebook Page** is the evidence that you recorded the procedures and raw data. Materials for photographed notebook pages are handwritten and expected to be legible.

## Post-lab Assignment

After each experiment, Notebook is due by 4:50 and the first Post-lab submission is due within 24 hours. Associated rubrics for Calculations, Propagation of Error, and Literature Comparison are within the Blackboard assignments. Your Post-lab might be graded multiple times: at the time of submission, and with any corrections up until the **Lab Report** is submitted. The final Post-lab grade is the one that counts towards the course grade.

### Calculations (3):

**Calculations** leading to final result, including graphs and worksheets imbedded into text file. One sample calculation for each formula or step. Submission of entire Excel worksheets and excessive typed equations/calculations is discouraged. Instead, include excerpts of Excel worksheets, small image files and handwritten, scanned or photographed calculations.

Q: For each calculation type, is (at least) one sample calculation shown along with complete carry-through of significant figures and units?

### Propagation of Error (3):

One sample calculation of **propagated error**

Q: For each calculation type, is (at least) one sample calculation shown?

### Literature Comparison (3):

Comparison of calculated value (with propagated error window) to accepted value, along with a cited source with complete reference information.

Q: *Is the comparison between calculated and accepted values addressed? Is there a reputable source named and cited?*

## Formal Lab Report and Grading Rubric

The lab report is uploaded to Blackboard as a single pdf document. **Submission of multiple files will result in a grade penalty. Please keep your Blackboard confirmation and verify the report was submitted.** The penalty for late reports is 1 point per day, or one subletter letter grade per day.

NOTE: *Calculations, Propagation of Error, and Literature Comparison* sections (9 points) are part of the [Post-lab](#). The Lab Report (15 points) has the elements described below. The *Literature Comparison* section of the Post-lab is expected to be included within *Sources of Error*.

Abstract (3): A brief **summary** of the entire experiment, including the final (numerical) result and comparison with accepted value and presentation of propagated error. (few sentences)

*Q: Does the abstract briefly summarize the lab purpose and experimental technique? Does it communicate the final values, errors, and comparison with accepted values?*

Experimental (3): A **synopsis of experimental** technique. What instruments or supplies were used? Concentrations? Was standardization performed? What data were taken? Include any data not included in *Data Presentation*. Anything unusual occur? (one-two paragraphs)

*Q: Does this section describe what was done in the lab? Enough detail to reproduce the data? Are instruments properly introduced with names and model numbers?*

Data Presentation (3): Well-organized **raw data and final calculated result**.

*Q: Is the raw data presented clearly, perhaps in a table as appropriate with units? Are tables from Excel imbedded into the report so these are easy to follow? Is the raw data presented clearly, perhaps in a table as appropriate with units?*

Discussion and Error (3): Statement of calculated value comparison with accepted value, with citation. A synopsis of **systematic and random errors**. Does one or more of the random values contribute more to error in the final value? Within specific systematic errors, does the “direction” of error (low or high) make sense? **How would these change results?**

*Q: Is the comparison between calculated and accepted values addressed? Are systematic errors specific and potentially correctable within experimental design? Is there discussion about any particular high random errors? Discussion of how systematic errors affect the final value?*

Cited References (3): You must use information and cite from assigned reading, plus any additional sources. Use in-text numerical citations according to the [ACS Style](#). Cite all “non-Dr. G.” sources you’ve used for your report, paraphrasing appropriately. Do not cite a reference you don’t use and do not use a reference you don’t cite.

## Cited References

Use **citation-sequence system** in accordance with the [ACS Style Guide](#). Cite all sources used besides the lab handout, paraphrase appropriately and avoid plagiarism. **Do not** cite a reference you don’t use and do not use a reference you don’t cite.