

## Post-lab Assignments in First-year Chemistry

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Post-lab assignments are submitted on the laboratory [Canvas](#) site and are graded by teaching assistants in accordance with a rubric provided by First-year Chemistry faculty.

**Data and Results.** Generally, the Data and Results section should be completed before the Discussion, Conclusions, and Abstract are written. A template spreadsheet in XLSX format (Microsoft Excel) is provided for each experiment that aids in the construction of tables and plots for the Data and Results section. Students are often asked to construct their own graphs from data entered into these spreadsheets with axes labels, a line of best fit, equation of the line, and correlation coefficient  $R^2$ . Measured and calculated values in tables in the spreadsheet should respect precision and [significant digits](#). In some cases, the use of [cell references](#) and [Excel formulas](#) can make post-lab calculations very efficient.

**Discussion.** The Discussion section is essentially a series of scientific arguments that explain how the raw data or observations collected during the experiment imply more generally useful results. For quantitative data, this means showing how results are calculated through a series of equations and explanatory text. For example, in a calorimetry experiment, the Discussion section might describe how temperatures and other measurements can be combined mathematically to produce the molar enthalpy change of a chemical reaction. Writing in the Discussion section should be clear and concise, logical, and consistent with data recorded in the laboratory notebook.

**Introduction.** The Introduction section is commonly written first. It provides background theory and prior work that helps orient the reader to the experiment. Questions in the Introduction will often ask students to describe key models or concepts from lecture that are important for understanding and interpreting the results and conclusions of the experiment. Based on background information in the Introduction, it is often possible to formulate a hypothesis concerning the outcome of the experiment.

**Conclusions.** Conclusions connect quantitative or qualitative results from the Discussion section (or Data and Results) to theoretical concepts or models. They help the reader see how the work supports an overarching theoretical idea or framework. As such, they represent a synthesis of the entire experiment into a small number of statements about ideas. The most important general results of the experiment may also be re-stated in the Conclusions section. By reading the Conclusions section, the reader should come to appreciate the importance and implications of the work described in the rest of the report.

**Abstract.** The Abstract is an executive summary of the entire report and should thus generally be written last. In essence, it is an “elevator speech” describing the experiment. It includes very brief background information, the most important results of the experiment, and the key conclusions. Brevity is essential in the Abstract. In the First-year Chemistry courses, each Abstract should be two hundred words or less.