

# Handout 2, part 2: How to Write an Introduction and a Method

Most labs have a purpose, an introduction, a procedure section, a data section, a calculation section, a results section, and an evaluation section. The goal of this hand out is to help you formulate an acceptable **INTRODUCTION and METHOD.**

We will use **'Experiment 1: Use of Common Lab Equipment, and Determining Significant Figures in Equipment'**, to explore how to format and write a lab, and look at other labs in the manual. The purpose should reflect the title of the lab (See HO 2, Part 1). Once you have written the purpose, you are ready to write the introduction. Reading each part of the lab BEFORE you start writing in your lab book will help with this process.

The **Introduction** has various names such as the **overview** and the **method**. The **introduction/method** is a brief description of what one hopes to accomplish this lab and how. It might contain a little background theory as stated in the lab manual or in the textbook. It should contain any pertinent reactions or mathematical expressions used in the lab. You should weave concepts learned in class into the introduction and method. Often the pre-lab sheet has information about what to include in this section. Remember, the lab class supports the lecture information and concepts learned in lecture supports the lab component of the class. Overall, communicate clearly what will be done in the lab. An adequate introduction for Exp. 1 might be as follows:

*In this lab, I will be exposed to the many types of lab equipment, such as balances and glassware, that I will use during the semester. The lab is divided into three main parts: Using a balance, using glassware, and calibrating a thermometer.*

*In Part I, I will practice techniques to accurately measure the resulting mass of the sample. I will use an analytical balance and a centigram balance in lab. The analytical balance is very sensitive to air currents, but are more precise than the top-loading. ( $\pm 0.01\text{g}$  vs  $\pm 0.001\text{g}$ ). Balances are affected by air currents, which will add a source of error to the measurement. The two techniques used will be the direct weighing method, and weighing by difference.*

*In Parts II and III, I will practice the safe use of laboratory glassware. In Part II, I will experimentally determine the density of water by measuring the mass of various water samples and the ensuing volumes. Since I am adding more variables to my measurement (air currents, accurately reading the meniscus of the water, the precision of the graduated cylinder, etc.) the average density of water will have systemic and random errors.*

*Part III will expose me to the proper use of a burette. The last section of the lab (Part IV) investigates the safe use and calibration of a thermometer. I will measure the boiling and freezing point of water with three different thermometers. Since I will not be using the same thermometer during the semester, I can use this 'calibration' to approximate the error in a general thermometer.*

*Throughout the lab, I will also investigate the impact of significant figures and error on my results. The two types of errors that will impact my results are Systematic errors such as human error, the instrument or tool, and the procedure, and Random errors such as air currents. Part II is an example of how the procedure can impact the amount of error in my results.*

An introduction might contain more information about background of the lab, explaining some of the processes that are occurring.

As a guideline, introduction/method should comprise no less than 200 words, and no more than 400 words; this one is 327 words. Longer is better than too short. You really want to think about what you are going to accomplish, how you will accomplish the lab, and how it relates to the concepts discussed in class.

**ALSO, SOME LABS DO NOT REQUIRE DETAILED INTRODUCTIONS; SOME REQUIRE A BRIEF METHOD STATEMENT, SO READ THE PRE-LAB CAREFULLY.**