

## Laboratory Notebook Preparation and Graphing Exercise.

### Prelab Activity

Purchase carbon copy lab notebook and safety glasses.

### Introduction

This lab activity introduces the lab student to three activities: 1) the details of keeping good records in the laboratory, 2) data collection, and 3) computer analysis/graphing.

### The Science Problem

A mathematical relationship exists between the volume and the mass of a substance. It is your responsibility to discover this relationship and identify the property that it represents.

### Procedure

*Preparing your lab notebook.*

Write your name and email address on the front of the lab notebook. You may choose to include other contact information like phone number if so desired. The primary purpose for this information is to make it easy for someone to return a lost notebook in a timely manner.

On the first page of the lab notebook there will be a **Table of Contents**, if not then enter the following:

#### *Table of Contents.*

Date	Lab Activity	page numbers
8/31/09	Graphing activity	1 -

We will conduct ~10 experiments this semester, so we will not completely fill the Table of Contents, **but you may use this same notebook for other chemistry classes.** For this reason, make a single line entry for each lab activity.

On lab notebook pages, enter all “header information.” You will work with a lab partner across the bench from you or as assigned by your lab instructor. Fill in your lab partner’s **full name** before leaving lab. Don’t forget the date.

Each new lab will start on a new page. After completing the header information, the first entry will be a brief comment about the purpose of the lab activity; use the heading, “**Purpose.**” Do **not** copy the purpose **word-for-word** from the introduction of the lab handout; simply paraphrase the key points mentioned in the introduction; short and sweet!

After the “**Purpose**” statement, many lab notebooks contain a detailed “**Theory**” section that describes the details of the science in the lab activity. We will **not** require a “**Theory**” section in this course, but instead we will note, under this heading, the book sections that are related to this material. After the “**Theory**” section start recording any lab data under the heading of “**Data.**” In this introductory lab you will collect and organize the data using a table. Enter the following data table, with title, in your notebook:

Table 1: Volume – Mass relationship for distilled water.

Volume of liquid (ml)	Mass of liquid (g)

#### *Data Collection (with lab partner)*

Obtain a 150 mL beaker from your glassware drawer and place it on an electronic “top-loading” balance. You will “tare” the balance, which means you will set the balance to read 0.00 g. Using a “squirt bottle” containing reverse osmosis (RO) water, fill the “tared” beaker up to the first volume mark (probably 20 mL). Be sure to account for the meniscus and be as accurate as possible. One partner will record the volume (ex. 20 mL) and the mass to 2 decimal places (ex. 19.60 ←note “0” IS a number) in their lab notebook data table. Repeat the mass measurement after adding additional liquid up to the next volume marked on the beaker. Stop data collection once you reach 100 mL. You should end up with at least 5 pairs of data points.

Return to your lab bench, discard the distilled water, and dry the beaker with a paper towel...**consider saving and reusing the paper towel.** At this time, transfer data into to all lab partner’s notebooks.

You will now repeat the measurement of a liquid two additional times with the following variations:

1) Instead of using the marking on the beaker, you will add 20.00 ml of RO water to the beaker using a graduated cylinder obtained from your drawer. We suggest using a squirt bottle to fill the graduated cylinder 90% to the mark and then use a small beaker from your drawer with RO water and a transfer pipet (plastic dropper) to add the last few drops. Be sure to account for the meniscus and be as accurate as possible. This data collection will require an additional table in your lab notebook.

2) Repeat the procedure that uses the graduated cylinder for an unknown liquid. Be sure to include the description (mainly ID# and color) of the unknown in your lab notebook.

Once you have collected all the 3 data sets and entered all data into your lab notebook, clean/rinse glassware with RO water. NOW, collect one more set of different “unknown” data from another lab group; enter data in your notebook making sure to include the full names of the other group members. **Now, request a “Reporting Sheet” from your TA in exchange for your lab notebook carbon copies.**

### Waste Management

None of the chemicals used in today’s experiment are toxic and therefore all waste solutions may be poured into the sink. Please note that we do **NOT** put used chemical back in the original container.