Experiment 1: Notebook Setup and Check-In

CH2250: Techniques in Laboratory Chemistry, Plymouth State University

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Introduction:

In this lab you will set up your lab notebook and begin to familiarize yourself with the equipment you will be assigned for the semester. In addition, you will work a few basic problems using metric system units to check your understanding of some fundamental concepts you will need in this course.

Procedure

A. Notebook Setup

1. Download and review the document "Keeping A Good Laboratory Notebook" from the course website (under "Course Files and Links") found at http://oz.plymouth.edu/~jsduncan/courses/
2. Write your name and the title of this course "CH2250: Techniques in Laboratory Chemistry" on the front cover of your notebook. Preferably use a permanent ink pen, such as a Sharpie. Otherwise use a ball-point pen.
3. *Always use a blue or black ball-point pen to write in your notebook*.
4. At the top of the first page of the notebook, write "Table of Contents." Write column headings for the date, experiment number, experiment name, and pages.
5. Start the first entry for today's experiment in the Table of Contents.
6. On the second page, start the entry for today's experiment by writing "Experiment 1: Notebook Setup and Check-In" at the top, along with the date and your name.
7. Write a "Purpose," "References," "Safety Considerations," and "Procedure" for the lab. The Reference section will simply include:

   > "Experiment 1," *CH2250 Lab Manual*, Department of Atmospheric Science and Chemistry, Plymouth State University (Spring 2010).

   The Safety Considerations section should include something like:

   - Take precautions to insure that glassware is not broken or lost.
   - Computers will be used in lab. Take precautions to ensure nothing is spilled on them.

   The Procedure should be brief and include steps for the three things you will do (Notebook Setup, Equipment Check, Math Check). For example, the "Notebook Setup" may include these steps:

   1. Download and review "Keeping a Good Laboratory Notebook"
   2. Label Notebook
   3. Start Table of Contents
   4. Start Experiment 1.

B. Equipment Check

1. Select your lab drawer. Write your lab drawer number on the cover of your notebook. Write your name and lab drawer number on the sign-in sheet provided by your instructor.
2. Obtain an Equipment List from your instructor. Write your name and drawer number at the top.
3. Carefully remove the items from your drawer and place them in an organized fashion on the lab bench. Put smaller items on paper towels to prevent losing them. Be particularly careful with things that can roll on the bench top; *please do not let them roll off and break.*
4. For each different type of item, draw a small sketch in your notebook. Identify each item by its appropriate name and provide a brief description of its use. You may wish to consult the "Equipment List" page, available on the course website under "Course Files and Links."
5. Check the Equipment List to ensure you have the proper number of each item. If you do, return the item(s) to your drawer and check it off your list. *Make sure everything is clean before storing it in your drawer*.
6. Obtain any missing equipment from the instructor.
7. Sign your Equipment List and return it to the instructor.

C. Math Check

Do the following problems, recording your work and answers in your notebook. If you struggle with any of the exercises, *consult the "Introductory Tutorials" on the course website*.

Metric System Exercises

1. Convert 0.0042 kilometers to centimeters.
2. What is the symbol for the unit kiloliter?
3. How many centimeters are in one meter?

Scientific Notation

1. Convert the following numbers from normal notation to scientific notation:
   a. 63.1
   b. 494.0004
   c. 0.30
   d. 0.001042
2. Convert the following numbers from scientific notation to normal notation:
   a. 7.337×10^{4}
   b. 2.04×10^{1}
   c. 6×10^{-3}
   d. 3.014×10^{-8}
3. With your calculator in Scientific Mode, enter the following numbers or equations. What is the result, shown in scientific notation on your calculator?
   a. 5489
   b. 0.0453
   c. 24×50
   d. $-480 \div 4000$
4. Use your calculator to do the following arithmetic operations. Give your answers in Scientific Notation (be sure to put your calculator in Scientific Mode before starting).
   a. $(3.14 \times 10^{5}) \times (0.15 \times 10^{4})$
   b. $(6.3 \times 10^{6}) \div (-2.1 \times 10^{-5})$
   c. $(3 \times 10^{8})^{2}$
   d. $\dfrac{2.4\times10^{3}}{-4.8\times10^{-6}}$
   e. $\dfrac{(9.6\times10^{-2})\times(2\times10^{8})}{4.2\times10^{6}}$
   f. $\dfrac{(7.2\times10^{-3})\times(3.1\times10^{6})}{(3.6\times10^{9})\times(-6.4\times10^{7})}$

Dimensional Analysis

1. Find the answer to each arithmetic expression using the correct units:

a.	25 s + 25 s =	d.	100 K × 10 s =	g.	0.12 mol ÷ 350 mL =
b.	10 m × 4 =	e.	36 mL + 5 s =	h.	35 mg/L × 0.25 L =
c.	9 g ÷ 5 L =	f.	1.2 cm × 3.0 cm =	i.	95 cm^3 ÷ 3.5 cm =

2. Convert each quantity into the units indicated (see Table 1-4 in your textbook or the "Dimensional Analysis" tutorial on the course website.:

a.	45 m into feet	d.	2.5 mol into millimole	g.	25 cm/s into mile per hour
b.	0.056 kg in grams	e.	15.5 nm into kilometer	h.	1 g/mL into oz per fl oz
c.	250 cal into Joules	f.	0.02 lb/mol into g per mole	i.	2 mm/ms into km per day

Conclusions

1. What rule of keeping a lab notebook do you think you are most likely to forget?
2. With which, if any, of the mathematical concepts tested above do you feel you struggle?

Final Notes

You should complete all the exercises and answer all the questions in your lab notebook **by the start of next lab**. When you have completed everything, sign and date at the end of your work. Carefully remove the duplicate pages, staple them, and hand them in as your lab report.