Concentration and Dilution Lab

**Objective:**

To become familiar with the process used to create stock solutions and accurately dilute stock solutions to produce a desired quantity of a lesser concentration.

**Materials:**

* 600 mL beaker
* 250 mL beaker
* 250 mL volumetric flask
* Triple beam balance
* Spatula
* Funnel
* Dropper
* 50 mL graduated cylinder
* 10 mL graduated cylinder
* Sucrose
* Tap water

**Procedure:**

1. Clean and dry all of the glassware that is present at your lab station.
2. You will create 250 mL of a 1.0M sucrose (C12H22O11) stock solution. Calculate the amount of sucrose that needs to be dissolved in 250 mL of water to produce the desired stock solution. Show all work and record your answer in the space below.

***Amount of sucrose needed:­­\_\_\_\_\_\_\_\_\_\_***

1. Measure out the amount of sucrose calculated in step 2 and place it in the 250 mL beaker.
2. Using the appropriate glassware, place 100 mL of water in the volumetric flask.
3. Add the sucrose to the water in the volumetric flask. Be careful not to spill any.
4. Agitate the water-sucrose solution until all of the sucrose has been dissolved.
5. Add the required amount of water to fill the volumetric flask to the indicator mark. Use the dropper as necessary to ensure that you have the exact amount.
6. Transfer your solution to the 600 mL beaker and clean your volumetric flask.
7. You are going to create 200 mL of a 0.4 M sucrose solution using your 1.0 M stock solution. Calculate the amount of the stock solution needed to create the desired solution. Show all your work and record your answer in space provided.

***Amount of Stock Solution Needed:\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

1. Calculate the approximate amount of water that you need to add to the answer from step 9 to create the desired solution. Show all your work and record your answer in the space provided.

***Amount of Water Needed: \_\_\_\_\_\_\_\_\_\_***

1. Measure out the amount of stock solution that you calculated in step 9 and place it in the 250 mL beaker. Be sure to be exact and use the appropriate glassware.
2. Add the amount of water calculated in step 10 to the solution in the 250 mL beaker. You have now created a desired solution from a more concentrated stock solution. Have your instructor come around and inspect your solution.

**Analysis Questions:**

1. Why might a process described in this lab be useful?
2. What are the advantages for diluting a stock solution?
3. How many grams of barium hydroxide will be needed if a lab requires 2.0 L of a 2.5M solution of barium hydroxide?
4. If I have a 12.0 M stock solution of hydrochloric acid, and I need 500 mL of a 3.0M hydrochloric acid solution, how much of the stock solution will I need, and approximately how much water will I have to add to it?