**Koolaid and Molarity Lab Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
 **Purpose**: The purpose of this lab is to create solutions of varying concentrations and observe differences between them.

**Pre-Lab Questions:**
1) We are going to prepare different concentrations of Kool-aid solution. Identify and label the solute and solvent below:

**Solute**:

**Solvent**:

2) Kool-aid is almost entirely sugar so we will use the formula for Glucose (C6H12O6) in our calculations. Use a periodic table and show calculations for the molar mass of glucose below:

3) Show calculations and determine how many grams of Kool-aid (C6H12O6) are required to create a 50.0 mL sample of each of the solutions below.

|  |
| --- |
| **Show Calculations** |
| **0.100 M Solution** |
| **0.400 M Solution** |
| **0.700 M Solution**  |

**Procedure:**1) Each group should obtain five clear cups. Use a clean graduated cylinder and measure 50.0 mL of water from the sink. In one of the cups, pour the water in, and carefully mark the outside of the cup where the water level comes to.

2) Use this cup as a guide. Put it next to a new empty cup and draw an approximate mark where the 50.0 mL would be. Repeat this step two more times so there are three newly marked cups, NOT including the original one. You should not drink anything from the original cup because I don’t want you to ingest any chemicals leftover from the grad. cylinder.

3) Each member of the group will be responsible for creating one of the samples. Tare/Zero an empty cup on the balance. Add the correct amount of Kool-aid to an empty cup and then return to your lab station. Do not use any beakers or glassware to mix water with the powder. I don’t want you to drink any leftover chemicals by accident. Very carefully use a clean cup and pour water from the sink into the powder. Fill the cup up to the line you marked earlier. Use a toothpick to stir your solution. Each member of your group should taste the solutions using a spoon. No one should drink directly out of the cup! Record observations in color and taste for each of the solutions in the data table.

|  |
| --- |
| **Qualitative Observations** |
| **0.100 M Solution** |
| **0.400 M Solution** |
| **0.700 M Solution**  |

4) Discuss how taste is related to the concentration of the solutions tested:

5) Pour 20.0 mL of your 0.700 M solution into a graduated cylinder. Add 30.0 mL of additional water to the graduated cylinder.
 A) Record observations when you added the additional water.

 B) Calculate the new Molarity of the solution.

6) Pour 30.0 mL of this solution down the sink and then replace with another 30.0 mL of water from the faucet.
 A) Record observations when you added the additional water.

 B) Calculate the new Molarity of the solution.

**Post-Lab Questions:**

7) Reading the label on the Kool-aid packet, they recommend using one rounded tablespoon of powder and mix with one cup of liquid water. The follow steps will allow you to calculate the Molarity of the “Recommended” Kool-aid solution.

 A) Ask Ms. Kovach about the mass of a rounded tablespoon and record the gram amount:

 B) Use your phones and look up the conversion between cups and mL. Record the conversion factor:

 C) Show calculations determining the Molarity of the “Recommended” solution:

12) Which of test sample that you created earlier was the closest to the “Recommended” dose? Discuss if you believe this Kool-aid is correct in their recommendation and explain why.

13) You’re having a sugar craving!! What would happen if you poured 200.0 grams of Kool-aid powder into one of your cups? Would the sugar dissolve? Explain your answer using terms like unsaturated, saturated and supersaturated.