Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Solution and Dilutions Inquiry Lab**

**Guiding Question:** How does the addition of water to a solution affect the percent by mass and molarity of the solution?

**Pre-Lab Questions:**

1. You will be creating a solution of aqueous sodium chloride. Identify the solute and solvent.
2. Define concentration and give examples of concentration units.
3. Define what it means to dilute a solution.

**Materials:** Volumetric flasks, plastic pipettes, beakers, balance, water, sodium chloride.

**Procedure/Data Calculations**

| 1. Create a specific assigned NaCl(aq) solution with specific supplies and measurements. Shake the solution to ensure it is homogenized.   Assigned Molarity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume of Concentrated solution: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
| --- | --- |
| 1. Calculate the percent by mass of the solution. *(Think about what data you will need!)* |  |
| 1. Dilute your original NaCl(aq) solution to a total volume of 100.0mL with specific supplies and measurements. (*Do not discard your new solution until you have ensured you recorded all measurements you need to answer questions on the next page.)* |  |
| 1. Calculate the percent by mass of the dilute solution. |  |
| 1. Calculate the molarity of the dilute solution. |  |

**Claim**: Answer the guiding question: How does the addition of water to a solution affect the percent by mass and molarity of the solution?

**Evidence**: Show relevant data and explain how the data is interpreted.

**Justification**: Provide necessary scientific concepts and models that support and explain your claim and evidence in more detail.

Follow Up Questions:

1. Use the dilution formula M1V1=M2V2 to determine the molarity of the second NaCl solution. (Solve for M2 and check your answer with your data).
2. **Describe** how you would create a 50.0mL 2.50M NaCl solution with the equipment you have. Show all calculations.
3. **Describe** how you would dilute the 50.0mL 2.50M NaCl solution to 1.25M with the equipment you have. Show all calculations.

