**Solutions Virtual Lab: Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**1) Obtain a computer and do a Google search for PHET Concentration Lab. Open up the web page and click on the play button. Allow the simulation to open.   
  
2) There are three ways we can classify solutions based on how much has dissolved. Identify and explain these three types of solutions.  
  
  
  
  
  
3) We can calculate the concentration of solutions. Identify the name of this variable and write out the formula for how it can be solved mathematically.

4) Once the simulation has opened, click on the drink mix shaker and shake some of the crystals into your water.   
Explain what happens to the particles and color of the liquid.   
  
  
5) Keep shaking until you create a saturated solution. Other than it telling you, how can you visually determine that you have created a saturated solution?

6) Click on the Concentration probe (It looks like crosshairs) and drag it into the solution. Record the Molarity of your solution.

7) Click on the faucet in the upper left of the simulation. Add additional water. Discuss how additional water affects the solution.  
  
  
  
8) Click the Reset All button in the bottom right and then click the drop down menu near the top of the page. Click and change the solute to Potassium Chromate. Repeat the above instructions and create a saturated solution.  
  
9) Using the probe to determine Molarity, calculate the amount of grams it took to create a saturated solution of Potassium Chromate. Show work below.   
  
  
  
10) Click the Reset All button and then change your solute to Potassium Dichromate. Repeat steps and create a saturated solution with potassium dichromate. Do all solutions have the same solubility? Discuss your answer.

11) Calculate how many grams it took to create a saturated solution of Potassium Dichromate. Show Work below.   
  
  
  
**Directions**: Close the simulation and return to the PHET website. In the search bar in the middle of the page, search for Sugar and Salt solutions. Click search, click on the Sugar and Salt simulation, and run the simulation.

**Procedure:** You will analyze different situations in each of the three tabs (Macro – meaning big picture, Micro – meaning small picture, and water tab) and then write about your findings in the sections below.   
  
**In the “Macro Tab”** experiment with the following situations and record your observations.   
  
1) Compare how the quickly the concentration or molarity compares when you add salt vs sugar. What does that mean about each substances solubility? (2 part answer)   
  
  
  
2) Discuss what it means if a solution is conductive?  
  
3) Test and record the results of the conductivity of each of your solutions.

**Change to the “Micro Tab”** at the top of the simulation. Experiment with the simulation and record your observations.   
  
3) Salt and Sugar are made up of different types of elements. Click on the periodic table and discusses the difference in bonding between Salt versus sugar. Be specific about the types of elements.

4) Salt and Sugar dissolve through different processes. Describe specifically how each substance breaks down in water and use your notes to identify the name of each of the processes. (Ex: Ionization, Dissociation, Dispersion)

**Change to the “Water Tab”** at the top of the simulation. Experiment with the simulation and record your observations.   
  
5) Click and drag the Salt molecule and drop it into the water. Using your observations, explain why salt is conductive when dissolved in water. (Hint: What is electricity and what does it need to flow?)  
  
  
6) Click “Reset all in the bottom left of the simulation. Then click “Water Partial Charges”. How do the water molecules align themselves when the salt molecules are dissolved? Be specific about charges.

7) Click and drag the Sugar molecule and drop it into the water. Using your observations, explain why sugar is not conductive when dissolved in water.