Name: _____ Class: _____ Date; _____

To Be or Not to Be … Saturated? That is the Question!

Learner Outcomes:

- Investigate the solubility of different materials, and describe their concentration.

Key Terms:

Solubility	Unsaturated	Solvent
Concentration	Solution	Saturation point
Saturated	Solute	

Background Information: When we make orange juice and other beverages out of crystals that are mixed with water, we create unsaturated solutions. If we kept adding more juice crystals until no more can dissolve, we would reach the saturation point and create a saturated solution. The saturation point is dependent upon temperature.

Purpose: a) How can you use observations to determine whether a solution is saturated or not?
b) How can you use this information to determine what an unknown chemical is?

Materials:

100 mL graduated cylinder	Scoopula	Glass stirring rod
250 mL beaker	Water	Aluminum tray
Triple beam balance	Sample of unknown chemical	

Procedure:

1. Use a graduated cylinder to measure 50 mL of water into a beaker.
2. Measure 5 g of one substance. Add this to the water and stir until the substance has dissolved. Record your observations.
3. Add more of the same substance, 5 g at a time and stirring until no more will dissolve. Record your observations.
4. Repeat steps 1-3 for each additional substance.

This investigation / activity has been adapted from:
Mah K, Martha J, McClelland L, et al. *Science in Action 9*. Toronto, ON: Addison Wesley.

Observations:

Substance	Mass Added (g)	Volume of Water (mL)	Concentration (g/100mL)	Observations

Analysis:

1. Calculate the concentration of each solution in g/100mL. Don't forget to correct for the volume of water in your experiment.

2. How did you know the solution was saturated?

3. What did you notice happened to the solubility of the solute as you got closer to the saturation point?

4. What might you have done to add just a little bit more?

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5. What were the solvent and solutes in this experiment?

Conclusion:

1. How can you determine when your solution was saturated? Give 1 specific piece of information.

2. What was the final solubility of your unknown sample? (in grams / 100 mL)

3. Using your answer to question # 3, determine what your unknown substance was by looking at the chart on page 28.

Extension:

If the solubility of ammonia is 92 g / 100 mL of water, how many grams of ammonia will you need to make a saturated solution in 250 mL of water? Be sure to show all calculations NEATLY with a pencil.

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