Scientific Method

TEKS 112.45(c)(2)(A)(B)(E)

Objective: The student will review steps of the scientific method and complete an experiment in which changing the reaction time creates different sizes of salt crystals.

Hook: Give students word scramble puzzle (attached). Ask students to share their science fair project experiences.

Direct Instruction: Show students science fair display board "The Effect of Time on Cadmium Sulfide Nanoparticle Size." Explain how Trina varied one reaction condition (in this case, reaction time) to create different sizes of cadmium sulfide nanoparticles. Talk about dependent and independent variables.

Independent Practice: Students will boil super-saturated salt water for 5 minutes and for 15 minutes. The salt crystals formed from each condition will be viewed under the light microscope and compared. See attached lab directions.

Assessment: The student will write up lab in lab notebook.

Name_____Period_____Date_____

SCIENTIFIC METHOD WORD SCRAMBLE

Unscramble the following words. (Hint: they are steps in the scientific method.)

TAAD _____

DROONIITUCT_____

MELBORP_____

TRESSLU_____

STRAAMLIE_____

YBIGRAPHILBO_____

SSTHEHYOPI_____

CEERRPODU_____

Salt Crystals Lab

Introduction: In order to practice the steps of the scientific method, you will make two sizes of salt crystals by varying the "reaction time." One beaker of super-saturated salt water will be boiled for 5 minutes and the other will be boiled for 15 minutes. A glass slide of each solution will be prepared and observed under the light microscope.

Objective: Do the sizes of salt crystals change with changes in boil time?

Safety: The materials we are using are not hazardous however we will be using Bunsen burners. Goggles, aprons, and lab dress code are required while you are at the lab tables.

Pre-Lab Questions:

1. Why do scientists change only one variable at a time when they design an experiment?
2. In this experiment, what is your independent variable?
3. What is your dependent variable?

Procedure:

1. Set-up Bunsen burner and ring stand apparatus.
2. Put 200 mL of water into 500 mL beaker.
3. Add 250 grams of salt.
4. Boil solution for 5 minutes. (After solution has reached a roaring boil, set timer for 5 minutes.)
5. After 5 minutes, turn off the Bunsen burner and carefully pipette about 2 mL of the clear solution from the top of the beaker (not from the undissolved salt on the bottom of the beaker).
6. Put several drops of this solution on to a glass slide.
7. Repeat steps 2 – 6 but this time boil the solution for 15 minutes.
8. After all the water has evaporated from the slides, observe the sizes of the salt crystals on the glass slides using the light microscope.

Data:

Reaction time (minutes)	Observations
5	
15	

Analysis/Conclusions:

1. What did you observe in this experiment?
2. Why do you think this phenomenon occurred?