Amy Schaefer

EDUC 443.S

1/30/11

**Class:** High School Chemistry (grade 11)

**Title:** Mixtures and Solutions

**Topic:** Homogeneous and Heterogeneous Mixtures

**Teacher:** Amy Schaefer

**5E Lesson Plan**

**Standards Addressed:** Learn the parts of a mixture/solution and differentiate between homogeneous and heterogeneous mixtures. CHEM.A.1.2.1

**Big Idea Addressed:** Differentiate between types of mixtures (homogeneous and heterogeneous) and learn the parts of a solution (solute/solvent).

**Concepts Addressed:** Heterogeneous mixtures are not uniform throughout but homogeneous mixtures are uniform. Heterogeneous mixtures are mixtures of solids. Homogeneous consist of solute and solvent (usually liquid and solid). How these different mixtures/solutions can be separated into components?

**Competencies Addressed:** Distinguishing between types of mixtures and being able to separate the mixtures into their own components.

**Questions:** Given a list of mixtures, identify heterogeneous and homogeneous mixtures. Give an example of a heterogeneous/homogeneous mixture. How can we separate the mixtures into the individual components?

**Required Materials:** different mixtures (Italian dressing, oil and water, different assortment of beans, hand cream with beads in it, soda, lava lamp, sand, salt, iron), Bunsen burner, beakers, evaporating dish, magnet, filter funnel and paper

**Activities:**

*Engage:* Describe the contents of the beakers/bottles at the front of the classroom (oil and water, salt water, beaker of different colored beans, hand cream with beads in it, dressing, soda, lava lamp, etc.). What is the same or different in these mixtures? What happens if we mix some of them together, will they mix together? Show a demo of two things mixing (blue and yellow to make green) and then things immiscible (blue and yellow make two layers).

*Explore:* Let students experiment with the bottles, consider if they can make something uniform/dissolve, how they could separate the elements, what other things in their world are similar to what they see in front of them. Talk about and record any observations and thoughts. Then have the students use the internet to find properties that make mixtures different from one another based on the observations they recorded.

*Lecture:* Different properties make substances interact with one another differently. Salt dissolves in water, oil won’t mix with water, and a handful of sand/stones (solids) will not magically form together or separate into different components. Homogeneous (solution) is uniform throughout—this occurs when a solvent is dissolved in solute. Heterogeneous mixtures occur usually with mixtures of solids—these are impossible to mix to complete uniformity. These two types of mixtures need to be separated differently—homogeneous mixtures usually need chemical means, where heterogeneous can usually be done physically.

*Explain:* Have students go back and look at the mixtures put in front of them and explain to one another what mixtures are heterogeneous or homogeneous, and then point out what parts are solutes/solvents. Have them come up with their own mixture and describe to the class why the mixture is heterogeneous or homogeneous. The students will give feedback to each groups’ description of a mixture.

*Elaborate:* In a lab have students separate a homogeneous and heterogeneous mixture (salt and water; salt, sand, iron), and then a mixture that uses a combinations of both techniques. Talk first as a class about possible ways to separate them by considering the different properties of the contents in the mixture. Can separate sand and salt by dissolving the salt, filtering sand, evaporating water. And then separate iron using a magnet.

*Evaluate:* Examples of different mixtures at each lab station that students go around and identify as heterogeneous/homogeneous, explaining why they pick heterogeneous or homogeneous. Then the student will pick one homogeneous and one heterogeneous mixture they identified and outline how they could separate the components.