Bay Area Scientists in Schools Presentation Plan

Lesson Name Mysterious Liquids

Presenter(s) Tilley Research Group

Grade Level 1 **Standards Connection(s)** Physical Science: Solids, liquids, gases have different properties; properties change with mixing, cooling, heating.

Abstract:

We will be using simple chemistry to determine the differences between two unknown liquids. The chemistry will involve mixing, dissolving, color changes, and reactions that make gases. We will then use our knowledge of the unknown liquids to separate gold (glitter) from dirt (brown sugar).

Vocabulary/Definitions:

Solid
Liquid
Gas
Mixture
Dissolve

Materials:

What you'll bring with you

Water, vinegar, baby oil, clear plastic cups, sand, sugar cubes, baking soda, food coloring, brown sugar, gold glitter, Bounty paper towels (brand is important), plastic spoons, rubberbands

What students should have ready (pencils, paper, scissors)

None

Classroom Set-up:

Student grouping, Power/Water, A/V, Light/Dark, set-up/clean-up time needed

Group by table, 4 per group is preferred
Chalkboard or dry erase board at front of room
Table or work area at front of room

Classroom Visit

1. **Personal Introduction:** _____5_____ **Minutes**
   We are graduate/undergraduate students in chemistry at UC Berkeley
   Each presenter will have their own intro/story to share
   Connect with chemistry students see all around them: fireworks, vitamins, swimming pools, etc…

   Topic Introduction: _____5_____ **Minutes**
   Go over vocabulary words. Focus on student examples rather than specific definitions.
   Explain what chemistry is, why it's important, and how it's related to the demo.

2. **Learning Experience(s):** ____30-40____ **Minutes**

   1) Explain to kids that chemists do not eat or drink what they're working with, especially if it is an unknown, because it could taste bad and hurt them.
   2) Administer unknown liquids (water + vinegar = A, baby oil = B) to kids in plastic cups.
   3) Have students add a small amount of sand to each liquid. Discuss what happens and begin to construct a table to illustrate the similarities/differences between the two liquids.
   4) Repeat Step 3 with a sugar cube. Might want to refer to it as a "special chemical" to keep every kid from trying to eat it.
   5) Repeat Step 3 with baking soda.
   6) Repeat Step 3 with food coloring. Presenters will add food coloring to minimize mess.
   7) Have students mix Liquid A with Liquid B and discuss what happens.
   8) Have students trade in all materials for a fresh cup of Liquid A and some gold ore (glitter + brown sugar). Ask students if they think they could separate the mixture with their hands.
   9) Have students pour the gold ore into Liquid A and stir with a plastic spoon.
   10) Give students filters (Bounty paper towel stretched over plastic cup with rubberband) and lots of paper towels underneath. Have them CAREFULLY pour the gold mixture through the filter. They can also rinse their pure gold with a small amount of Liquid A.

3. **Wrap-up: Sharing Experiences and Building Connections** _____5_____ **Minutes**

   Review table. Conclude by tying to vocabulary, chemistry, and big picture.

4. **Close:** _____5_____ **Minutes**

TOTAL ____50-60____ **Minutes**

Follow-up – After Presentation

Suggest students write a letter explaining "How we learned about _____?"
List or attach examples of activities, websites, connections for additional learning.
Attach worksheets, hand-outs, visuals used in classroom presentation.

Reading Connections:

- A Drop of Water by Walter Wick http://www.amazon.com/Drop-Of-Water-Science-Wonder/dp/0590221973
- Everything Is Matter by David Bauer (also available in Spanish) http://www.amazon.com/Everything-Matter-Yellow-Umbrella-Books/dp/0736829423
- Matter by Christine Webster http://www.amazon.com/Matter-First-Facts-Physical-World/dp/0736826173