

## Activity #1:

### Water Pollution: A Demonstration

This lesson can serve to introduce students to the concept of water pollution. It may be used as a class demonstration done by the teacher or by a group of students.

**Objective:** Students will demonstrate an understanding of water pollution by participating in class discussion and/or by answering selected teacher questions.

NEVADA SCIENCE STANDARD 16:8

**Time:** One class period for demonstration and discussion

**Materials:** two one-quart jars with lids, methylene blue, glucose, sodium hydroxide (lye), scales or balances, graduated cylinder  
(high school chemistry lab should have all necessary chemicals)

#### Procedure:

##### A. Teacher Preparation –

1. Dissolve one tablespoon of glucose in 500 ml of water.
2. Dissolve one tablespoon of sodium hydroxide in another 500 ml of water.
3. Add six drops of methylene blue solution to the sodium hydroxide solution.  
(Accuracy is not extremely important!)

##### B. Demonstration –

1. Show the class the glass jar (#1) containing the sodium hydroxide and methylene blue solution.
  - a. Indicate that this container represents Lake Mead.
  - b. Tell the class that the blue color represents oxygen dissolved in the lake water. The oxygen is very important for the animal life present in the lake.
  - c. Ask students to name some of the animals that use the lake as their home.
2. Pour the contents of jar #2 containing the glucose solution into jar #1.
  - a. Indicate that this will represent a wastewater spill in the lake and that wastewater sometimes reacts with the oxygen and with the living organisms in a lake.
  - b. Ask if students have knowledge of such spills taking place. (As discussion progresses the blue color will gradually fade and disappear, indicating that the oxygen is being depleted.)
  - c. Have students discuss what effect this would have on life in the lake.

C. Follow-up Discussion –

1. Explain to students that this demonstration is very similar to what happens to some streams and lakes. Indicate that wastewater is mostly *organic matter*. The “wastewater” in the demonstration was sugar. In water, microscopic organisms use wastewater as food and produce carbon dioxide. This process uses up the oxygen in the water.
2. In this demonstration, the fading of the blue color represents depletion of the oxygen. If organic pollution in a stream, river or lake is too great, much of the oxygen will be used up and living organisms will die.

**Teacher Note:**

You may wish to have your students listen to the water quality song on the enclosed audio tape. It was written and performed by James Quill Smith for the Southern Nevada Water Authority.