

## **What's Dancing in the Water?**

**Subject:** Science and Language Arts

**Topic:** Water Quality: Application of the Scientific Process

### **Goals**

Students will discover that pollution is not always visible by conducting science experiments. Students will learn that water is vital to all living things and becomes a part of all living things.

### **Materials Needed**

Large clear bowl, water, food coloring, enough quart jars for each group of 4 students, enough stalks of celery for each group to have one, Journal page or paper

#### **State Standards Addressed:**

Standard 4.2: Students will identify water as a natural resource.

Standard 4.3 Environmental Health: Students will know that all living things need water to survive.

Students will understand that many elements of nature are interdependent.

### **Methods**

Demonstration/Discussion/Experimentation/Recording Results

1. The teacher begins by gathering the class around a space where all can see and hear the opening demonstration and participate in the discussion.
2. The teacher begins by pouring about a cup of water into a large, clear vessel and explains that this is clean water that is suitable for drinking. Scientists and engineers in our community test this water and ensure its safety. At that point, the teacher introduces food coloring and explains that this will represent pollution in today's lesson. What is pollution? Define term and guide student responses to this question. The teacher then proceeds and adds one drop of food coloring and stirs it in the bowl...everyone can see the color the water takes on....Can we see the pollution? The teacher proceeds to add more and more water and asks at points along the way if we can still see the pollution? As the vessel fills.....the color becomes diluted and is not very intense. It is not noticeable anymore. Is the pollution (food coloring) still there? The teacher proceeds to guide students through the notions of solubility, microscopic organisms, etc.... and they will conclude that all pollution is not visible to the eye.
3. Students return to their tables where they will work in small groups to fill a jar with water, add food color and a stalk of leafy celery. This experiment will be viewed in the next days to visualize how water moves through a plant and thus how pollution will reach it. Guide kids to hypothesize what they think will happen and record their responses on a class chart.
4. Change the pace: Move kids to an open space to play an observation game. In this game students will face the teacher and observe him/her. They will then be asked to turn around and have their back to him/her. The teacher will change something about his/her appearance and signal for the kids to turn around. Can anyone see what is different? (Changes can start large and get smaller: Ex. Put on a hat, put on a glove, push up sleeve, tuck necklace inside sweater, roll pant leg, close one eye, take off or put on glasses, etc... Scientists observe! Explain that scientists observe carefully and record specific details of what they do so that they can recognize changes. Keep this in mind as you illustrate in today's journal page.
5. Students will return to their tables and draw a picture in their science journal of what the start of the

experiment: The celery inside a jar of colored water looks like. They will color it appropriately to show the scene in detail. (A pre-drawn black and white picture can be given and just colored by students as a way to modify this if preferred.) This same activity will be repeated 2 days later to record changes and evidence of water travel and absorption as they are seen in the celery. (Red color will extend through the celery leaves and become quite visible)

6. The evaluation of student understanding will be accomplished through written responses in journals and through the discussion of this experiment and its results over the next 3 days. Students will conclude that water pollution affects humans too since we eat many things that grow and drink water ourselves. Water is part of us too.

### **Resources**

The contents of this lesson combine lesson ideas I have used through the years to match up with the state standards more closely and prepare students for lessons on the watershed. I utilized the following resources to guide my plan and think about the topic. FRIT teacher's course 2010. Anyone can benefit from the following publications and they can be requested at <http://agsci.psu.edu>

[From the woods: Watersheds](#) Prepared by Brian Swistock and Stanford Smith, 2008

Water Quality Matters: 4-H water project, unit3 Written by: Joy Drohon, William Sharpe and Stanford Smith, 2004

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