

## Chapter 1. What is Water Quality?

### Lesson 4. Primary and Secondary Contaminants

**Overview:** To appreciate the importance of water quality, we must understand what water quality is. This lesson presents an overview and general principles of water quality.

**Purpose:** The purpose of these activities is to introduce students to water quality, and cause them to think about its importance.

#### Ideas Taught:

- Water quality depends upon three different factors: type of contaminant, effect of the contaminant on human health, and length of time it takes for that effect to become evident.

#### Materials Needed:

- Mason jar or clean mayonnaise jar full of water
- Clean sand or a handful of small pebbles
- Mason jar full of water, to which you have added a few drops of red and green food coloring.
- Mason jar full of water to which you have added either a small amount of household bleach, gasoline, or motor oil
- Paper towel or coffee filter
- Funnel
- Empty mason jar or clean mayonnaise jar that funnel will fit into
- A supply of small plastic or paper drinking cups

#### Procedure:

1. \_\_\_\_ Hold up a jar of clean water and ask the students if any of them would be interested or willing to take a drink of water. Offer a small cup of water to students who are willing to take a drink. If necessary, fill two jars or fill the same jar again with tap water.
2. \_\_\_\_ Ask the class how the water tastes. Assure them that nothing is wrong with the water.

3. \_\_\_ Explain that good quality water is a real pleasure and something none of us should take for granted.
4. \_\_\_ Hold up the jar of colored water. While the class is looking, add the pebbles or sand to the jar of water.
5. \_\_\_ Ask the students if any of them would be interested or willing to take a drink of the water. Compare the number of positive responses to the previous example.
6. \_\_\_ Now pour the water through the filter paper, filtering out the sand and pebbles and offer a drink of the filtered water to anyone willing to take a drink. Explain that there is nothing wrong with the water.
7. \_\_\_ Explain that some contaminants are harmless - but they do influence the quality, condition, or appearance and appeal of the water.
8. \_\_\_ Explain that this sample contains food coloring and sand, both of which may change the aesthetic quality of the water, but not the health related quality. The contaminants are what we call secondary contaminants.
9. \_\_\_ Write the words "secondary contaminant" on the board. Beside the words, write "They may affect condition, but do not normally affect health."
10. \_\_\_ now hold up the jar of water contaminated with bleach, gasoline or motor oil. Ask the students if any are willing to take a drink. Note the responses and see how much they differ from the past responses.
11. \_\_\_ Pass the jar of water around and have the students look closely at the water and smell it.
12. \_\_\_ Again, ask the students if any are willing to take a drink. You should get a much different response.
13. \_\_\_ Explain that the water contains petroleum products or cleaning agents, which are different type of contaminants than the food coloring or water.
14. \_\_\_ Tell the class that we define contaminants that affect health as primary contaminants. Write the words "primary contaminants". Beside the words, write "They may affect the health of humans adversely."

***Lesson Learned: We can categorize contaminants as either primary or secondary, depending on how they influence human health. Secondary contaminants are usually easy to deal with, while primary contaminants are usually difficult to deal with.***

**The lesson above was adapted from "*What is Water Quality? A Resource Guide for 4-H Leaders and Teachers*," 80 pages of activities and experiments related to water quality. (\$5.00) Order from the Montana 4-H Program at Montana State University-Bozeman. Phone 406-994-3501.**