

Chapter 1. What is Water Quality?

Lesson 3. Contaminants come in a variety of forms: physical, chemical, and biological

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: Three quart mason jars or clean quart mayonnaise jars full of water Two empty quart canning jars or clean quart mayonnaise jars Spoon Pepper (in a shaker) or about 1/4 teaspoon of washed sand Salt or sugar (1/4 teaspoon or a sugar cube) Live goldfish Paper towels or coffee filters Funnel

Procedure:

1. ___ Before the class assembles, add about 1/4 teaspoon of salt or sugar to the water in one jar and stir until the sugar or salt dissolves.
2. ___ Add a little pepper or the sand to the same jar and stir again.
3. ___ Place the goldfish in the other jar of water only.
4. ___ When the class assembles, hold up the two jars and ask the class what is in the water. They should respond by saying the jars contain water, a goldfish, and something dark in color.
5. ___ Let them guess what the substance is.
6. ___ After they have guessed, explain that the jars contain water and three different types of possible contaminants of water.
7. ___ Ask the class what types of contaminants they can think of. Do not let them go off the subject.

8. ___ Explain that contaminants can be assigned to one of three general categories.
9. ___ Use the goldfish as an example: Explain that the goldfish falls into the category of biological contaminants. Ask for other examples of biological contaminants.
10. ___ Continue the discussion and ask the students what other categories of contaminants. Explain that the dark substance is pepper (or sand), which is a physical contaminant. Ask them what other physical contaminants might be.
11. ___ Continue the discussion and ask what the third type of contaminant is. If they do not guess, explain that the jar with the pepper (or sand) also contains sugar (or salt). Explain that this is an example of a chemical contaminant. Have the students name other chemical contaminants.
12. ___ Review with the students the three types of contaminants that can be found in water: Biological, Physical, Chemical. Write the terms on the board. Tell the class that we can categorize water quality based on these three categories of contaminants.
13. ___ Now place a coffee filter or piece of paper towel in the funnel.
14. ___ Pour the water from the jar containing the pepper (or sand) through the funnel. When it has stopped draining, hold up the jar of clear water and explain that it is sometimes easy to remove contaminants through filtration.
15. ___ Do the same thing with the jar containing the goldfish, transferring the goldfish into the remaining jar of water. Explain that it is sometimes easy to remove biological contaminants also, either by filtering the water or treating it with some chemical.
16. ___ Ask the class how they might remove the sugar (or salt). After the students have made suggestions, tell them that chemical contaminants are not always easy to remove.
17. ___ Again, refer to the three words on the chalk board: Biological, Physical, and Chemical contaminants.

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)

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