

Water Pollution Cleanup Lab

Background Information:

While some polluted bodies of water have improved recently, it is very important to maintain the purity of a pond's water. While laws do exist against water pollution, there are many local polluters who violate these rules and get away with it. These careless or thoughtless polluters could easily contaminate a local pond or waterway.

Today, you will get a chance to clean up pollution. Using your water samples and supplies, your job is to get the water samples as clean as possible. You will work with a group of students to try to accomplish this task. First, take some time to plan a course of action. One person in your group should record each of the steps that were taken. Your sample will be evaluated at the end of the exercise.

Pre-Lab: Bring one of your jars to the front of the room. Your teacher will "pollute" your sample with the following items:

vinegar (represents acid rain)

torn paper/trash (represents litter)

leaves/muck/compost (represents organic matter)

sand/rocks/clay (represents inorganic matter)

food coloring (represents chemical pollution)

corn oil (represents gasoline/oil spills)

liquid Dawn dishwashing liquid (represents soap/detergent)

After shaking it vigorously, return to your group and begin the cleanup lab.

Title: *How well can you clean up a sample of polluted water?*

Purpose: To compare pollution cleanup techniques and evaluate the complexity of the water cleanup issues. Students should develop an understanding of personal health, populations, resources, environments, and natural hazards. Students should also learn about the role of science and technology in society. Students should learn about scientific inquiry and develop the abilities necessary to perform it.

Materials: cloth, pencil, screening, bucket, sponge, spoon, eyedropper, funnel, worksheet, paper towel, pH test paper, masking tape, trash barrel, cotton, sand (100 ml), beaker for sand

Two Ball canning jars (with lids) of water (600 ml each) from local source one polluted by the teacher, one clean)

(Continued)

(Continued)

Procedure:

1. Talk with your group and discuss your cleanup plan.
2. Assign a student who will record your steps.
3. All pouring should be done over the bucket to avoid making a mess.
4. After each step, record your results on the “Cleanup Record” sheet.
5. Solid wastes can be dumped into the trash barrel provided.
6. At the end of the activity, each group should have at least a ½ jar of “cleaned” water to compare to the results of other groups.
7. Bring your cleaned jar to the front table for evaluation according to the “Cleanup Rubric.”
8. Each group is responsible for the cleanup of their table and work area.
9. Return all cleaned materials to their original locations.

Results: Record your results on the Cleanup Record Sheet below:

The Cleanup Record

Step #	Technique Used	What pollutant is to be removed?	Was this pollutant successfully removed?

When the cleanup is finished or time is up, list the pollutants below in the order of how hard they were to clean up—easiest first, hardest last.

(Continued)

(Continued)

Teacher Notes:

Judge each sample by comparison. Compare Primary Treatment first. If there is a tie, then the teacher judges Secondary Treatment. If there is still a tie, then the teacher should judge Tertiary Treatment.

On the teacher table, baking soda should be provided to help with pH adjustment. I usually do not advertise this, as pH is often not visible. See if students are aware of this as they work!

Tasks		Points Achieved	Score
Primary Treatment: All litter and trash have been removed. All sediment has been removed. All visible particles that could settle to the bottom of the jar have been removed.	10 points	0 1 2 3 4 5 6 7 8 9 10 none/poor/acceptable/good/excellent	
Secondary Treatment: The water surface has been skimmed and all surface pollutants have been removed. Soap bubbles and fat molecules have been removed. Water is clean enough to allow swimming.	10 points	0 1 2 3 4 5 6 7 8 9 10 none/poor/acceptable/good/excellent	
Tertiary Treatment: All pollutants have been removed, with only trace elements of each present. The pH is nearly neutral. Water is drinkable.	10 points	0 1 2 3 4 5 6 7 8 9 10 none/poor/acceptable/good/excellent	
		Total Score:	

Note: Usually, the hardest to remove is food coloring, representing chemical pollution. This is true in society and sometimes the hardest to detect. Trace elements of antibiotics are found in most water samples, as well as tiny particles of plastic (too small to filter easily).

Retrieved from the companion website for *100 Brain-Friendly Lessons for Unforgettable Teaching and Learning (9–12)* by Marcia L. Tate. Thousand Oaks, CA: Corwin, www.corwin.com. Copyright © 2020 by Corwin Press, Inc. All rights reserved. Reproduction authorized only for the local school site or nonprofit organization that has purchased this book.