

Polluted Ponds Lead to Polluted Groundwater

Skill: Science

Objectives

Students will:

- observe and record (by use of a demonstration) how ponds (and eventually groundwater) become polluted from oil, chemicals, and detergents.

Background

There are many ways in which water becomes polluted. First, there is natural pollution. Soil, leaves, and tiny organisms get into the water from nearby land. Then, there is pollution caused by people. In farm areas, plant nutrients and insecticides get into streams and lakes, so does runoff from animal feed lots. In industrial areas, harmful wastes are dumped into the water from factories and refineries. In cities, sewage and runoff from trash dumps find their way into the water. This, in turn, seeps into the groundwater, which is where a number of cities and most rural areas get their drinking water. Pollution of water is a very serious problem.

Procedure - Part 1

Follow these steps to make your own polluted pond water and see what pollution can do to our groundwater. Record findings on the accompanying Student Activity Page.

- Label 2 jars each 1, 2, 3, and 4 with masking tape. Fill one set of jars (1-4) with lids halfway with water.
- Observe the water in jar 1. Describe it on the Student Activity Page.
- Put one tablespoon of oil in jar 2; tighten the lid and shake the jar. What did you observe? Record your findings.
- Put one tablespoon of vinegar in jar 3; tighten the lid and shake the jar. What did you observe? Record your findings.
- Put one tablespoon of detergent in jar 4; again tighten the lid and shake the jar. Record your findings.

Procedure - Part 2

The following steps illustrate how the polluted pond water affects the groundwater.

- Put soil in the funnel and place the funnel on empty jar 1.
- Pour the contents of jar 1 (water only) through the funnel and let it drip into the glass. Record your observations on the Student Activity Page.
- Move the funnel with the soil to empty jar 2. Pour the contents of jar 2 (oil and water) into the funnel. Observe and record your findings.
- Repeat steps with jar 3 (vinegar) and jar 4 (detergent). Observe and record your findings.
- Compare the findings of Procedures 1 and 2.

Vocabulary

- groundwater
- polluted
- chemicals
- detergents
- organisms
- nutrients
- insecticides
- factory
- refinery
- sewage

Materials

- 8 pint jars (4 with tight-fitting lids)
- 1 tablespoon of oil
- Masking tape
- 1 tablespoon of vinegar
- Pencil
- 1 tablespoon of laundry detergent
- Funnel
- Soil
- A Student Activity Page for each student

P.A.S.S.

4th Grade

- Read 1.1, 3.1b
- Oral 3.2
- Process 1.2, 3.1,3, 4.1,4, 5.4
- Life 3.1

5th Grade

- Read 1.1a, 3.1b
- Oral 3.2
- Process 1.2, 3.1,3, 4.1,4, 5.4
- Life 2.2

6th Grade

- Read 1.1a, 3.1b
- Oral 1.2
- Process 1.1, 3.1,5, 4.1,5, 5.4
- Life 4.2
- Earth 5.2



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Follow-Through

1. If these elements were added to a real pond and seeped into the groundwater, how would it affect the water in the pond and the ground?
2. How would animals and people be affected?
3. Why did we use the same soil?

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Student Activity Page

How Clear is the Solution?

Part 1 Observations:

Jar 1 _____

Jar 2 _____

Jar 3 _____

Jar 4 _____

Part 2 Observations with the Funnel:

Jar 1 _____

Jar 2 _____

Jar 3 _____

Jar 4 _____

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