Hands-On

QuickLab

15 min





Contaminated Water

In this activity, you will learn how contaminated water can spread an infectious disease.

Procedure

1. **CAUTION: Do not taste or touch the fluids used in this lab.** Obtain one test tube of fluid from your teacher. Some test tubes contain pure water. One test tube contains water that has been "contaminated".
2. Pour half your fluid into the test tube of a classmate. Your classmate will then pour an equal amount back into your test tube. Exchange water with three classmates in this way.
3. Your teacher will now put a small amount of a test chemical into your test tube. If your water turns cloudy, you have been "contaminated."

Analysis

1. CRITICAL THINKING **Analyzing Conclusions** Who had the test tube that started the "infection?"
2. **Identify** a disease that could be spread in water.

The Environment and Health

Our health and quality of life are affected by the state of the environment. **Pollution and habitat destruction destroy the resources we need to live, such as the air we breathe, the water we drink, and the food we eat.** Air pollution can cause headaches, sore throats, nausea, and upper respiratory infections. Air pollution has also been connected to lung cancer and heart disease. Some chemical pollutants in drinking water can lead to birth defects and cancer. Many infectious diseases, such as cholera, are spread by water polluted by sewage. Habitat destruction can also affect our safety. The root networks of trees help hold soil in place. Cutting down trees increases the number of landslides and floods, which can cause deaths and injuries.

READING TOOLBOX

Word Parts Look up the suffix *-tion* in the dictionary. Also, look up the words *pollute* and *destroy* in a dictionary. Then, write your own definition for *pollution* and *destruction*.

Section 1 Review

KEY IDEAS

1. **Explain** how human population affects the environment.
2. **Describe** the difference between renewable resources and nonrenewable resources.
3. **State** a nonrenewable resource that you used today.
4. **State** three ways that environmental problems may affect human health.

CRITICAL THINKING

5. **Inferring relationships** Events such as floods and landslides are commonly called *natural disasters*. Explain how both natural events and human actions might have contributed to a natural disaster that you have learned about.
6. **Analyzing data** Consider a 1,000-year-old forest and a 30-year-old tree farm. How do differences between these resources affect how renewable the resources are?

WRITING FOR SCIENCE

7. **Evaluating viewpoints** A classmate argues that pollution is a necessary evil to produce food, jobs, and a high standard of living. Write a one-page paper describing your opinion of your classmates argument. Support your opinion with facts.

Answers to Section Review

1. The human population affects the environment by using resources, causing pollution, and destroying habitats.
2. A renewable resource can be replaced at the same rate at which the resource is consumed. A nonrenewable resource forms at a rate that is much slower than the rate at which the resource is consumed.
3. Sample answer: Oil is a nonrenewable resource that I used when I rode in a car.
4. Air pollution can cause headaches and respiratory infections. Polluted water can lead to birth defects, cancer, and infectious disease. Deforestation can increase the number of landslides that can cause death and injury.
5. The flooding of the Gulf Coast in 2005 was a natural disaster made worse by the overdevelopment in lowland areas and flood plains.
6. The trees in the tree farm are more renewable because they can be replaced every 30 years. Trees in the forest could be harvested only once every 1,000 years. The forest also has habitats for many other organisms, which would be damaged by its harvest, whereas the tree farm exists specifically to be harvested periodically.
7. Accept all reasonable responses. Make sure students state facts from this section or other sources to support their opinions.

QuickLab

Teacher's Notes Prepare a test tube with water for each student. Dissolve 1 g of salt in half of the test tubes. The saltwater tubes represent an infectious disease. Do not label the tubes. After students do the water exchange, add 5 mL of aqueous silver nitrate to each test tube. Samples with salt (infectious disease) will become cloudy when silver nitrate is added.

Materials
- salt
- silver nitrate, aqueous
- test tube with clear liquid

Safety Cautions Dispose of silver nitrate as hazardous waste.

Answers to Analysis

1. Answers will vary.
2. cholera

READING TOOLBOX

Word Parts pollution—the act of making dirty; destruction—the act of breaking down LS Verbal

Close

Formative Assessment

Which term describes a resource that is replenished at a rate that is lower than the rate at which it is used?

A. renewable (Incorrect. The resource would have to be replenished at a higher rate to be renewable.)
B. nonrenewable (Correct! The resource is being depleted.)
C. in equilibrium (Incorrect. The rates would have to be equal for this condition.)
D. infinite (Incorrect. The resource is being depleted, so its supply is not infinite.)