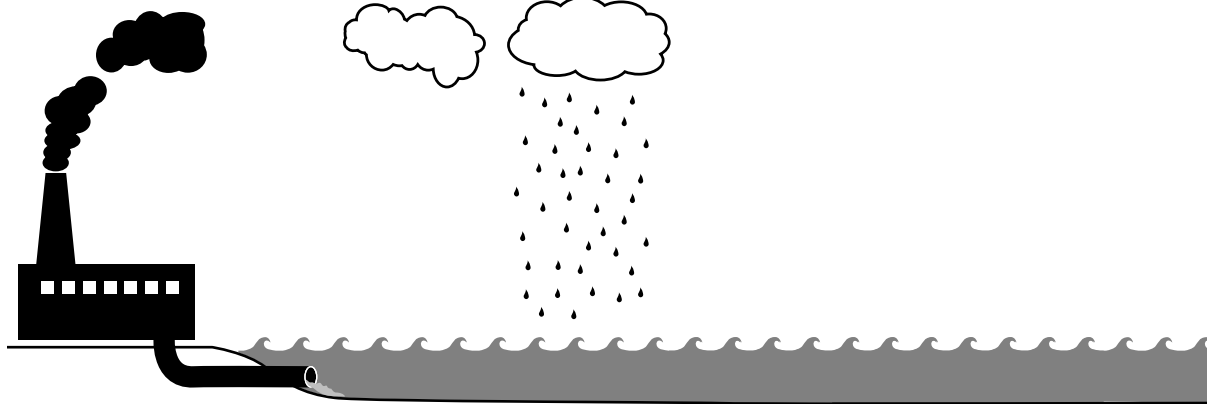


The Water Cycle and Sources of Pollution



Objectives

- ▶ understand the water cycle
- ▶ understand sources of water pollution
- ▶ experiment with techniques for cleaning polluted water

Vocabulary

water cycle

evaporate

condense

Background

The earth's water is constantly on the move in a circle of events called the water cycle. On a warm day, water from the surface of the ocean, a pond or even a puddle evaporates and rises into the atmosphere. As water vapor rises, it cools and condenses to form clouds. The clouds become heavy with water until they can hold no more. Then raindrops form and fall. On land, the water runs downhill, eventually finding its way to a stream or river, then back to a lake or to the ocean where the cycle begins again.

As the water runs off of the land and back to the oceans, it carries with it many substances that it picks up along its way. It could run through a pool of gasoline spilled at the pump, loose dirt from the

construction site, or fertilizers from the golf course. All of these cause pollution in the marine environment; pollution that not even the most modern equipment can clean up.

For many years, scientists have worked to stop pollution that is piped into the ocean from sewage treatment plants and factories. Now they must also try to stop pollution on land before the water cycle picks it up and carries it to the sea.

Materials

Containers	Pollution and trash	Cleaning materials
dish pan	vegetable oil	spoons
2 pie plates	food coloring	slotted spoons
watering can	perfume	strainers
clear plastic cup	rice (raw or cooked)	cheesecloth
	small pieces of plastic	cotton balls
Materials to make land	foil and paper	tongs
modeling clay		
dirt		
sand		

Activity

As a class, discuss the steps in the water cycle. Ask students to complete Part I of the Water Pollution Worksheet. The following activity will demonstrate how the water cycle and water pollution can be related.

1. Work with students to make an island by filling one of the pie plates with modeling clay. Mound clay slightly in the middle of the island. Place a layer of dirt, approximately 1/2 inch thick, in the center of the island to simulate a construction site. Layer sand around the edges to simulate beaches.
2. Select students to spill simulated pollution and trash (vegetable oil, food coloring, perfume, plastic, foil and paper) on the top of the island.
3. With students, invert the second pie plate in the dish pan. Pour clean water around the bowl to simulate the ocean. Place the "island" on top of the inverted pie plate.
4. Fill the watering can with clean water. Select a student to slowly pour the water over the island to simulate rain. Observe how the rain washes dirt, sand and pollution off the island and into the ocean. Ask students to record their observations on Part II of the worksheet.
5. Have students take turns using the spoons, strainer, cheesecloth and cotton to try to remove pollution from the water. Have students record their clean up methods and results on the worksheet.
6. Ask students to observe the water in the dish pan after they have tried to clean it up. Discuss: Is it clean? Which pollutants could students remove? Which cannot be removed?
7. Pour some of the water from the dish pan into the clear plastic cup. Ask the class: What color is the water? Why? Can students see through the water? Could plants living in this water get enough sunlight for photosynthesis?
8. Ask students to smell the water. Discuss: What can they smell? Why? Chemical pollution, food coloring and perfume, dissolves in water. This type of pollution is especially difficult to remove.

Extend the Activity


Have students research water supply and water treatment facilities in your community. Ask students to develop a water cycle which includes a stop at the school water fountain. Work with students to create a display which follows the path of this water from raindrop, to reservoir, to school, to water works, to ocean and back to the clouds. Post it near the water fountain for other classes to enjoy.

Challenge students to keep a daily journal of the water they use and the solid waste (trash) they generate for one week. Do they try to conserve? Do they recycle? Ask them to list at least five ways to save water or create less trash.

Water Pollution Worksheet

Name: _____

Part I: Draw the water cycle. Use arrows to show how the water moves.



Part II: Record your observations and conclusions about the experiment.

1. What happened when water was poured on the island?
2. Which tools did you use for clean up? How did you use them?
3. Which types of pollution could you remove?
4. Which pollution could not be removed? Why not?
5. List two things you have learned about water pollution from this experiment.