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Protecting the Water Supply

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CONCEPT 1 Protecting the Water Supply

Lesson Objectives

- List ways to reduce water pollution.
- Describe how water is treated.
- Identify ways to conserve water.

Vocabulary

- water treatment

Introduction

The water supply can be harmed in two major ways. The water can be polluted, and it can be overused. Protecting the water supply must address both problems. We need to reduce how much pollution ends up in the water supply. We need to treat water that's already polluted. We need to conserve water by using less.

Reducing Water Pollution

In the mid 1900s, people were startled to see the Cuyahoga River in Cleveland, Ohio, burst into flames! The river was so polluted with oil and other industrial wastes that it was flammable. Nothing could live in it. You can see the Cuyahoga River in **Figure 1.1**



FIGURE 1.1

Left: The Cuyahoga River flows through Cleveland, Ohio. In the mid 1900s, there was a lot of industry in this part of Ohio. The river became very polluted. Right: Today, the river is much cleaner.

Controlling Water Pollution

Disasters such as rivers burning led to new U.S. laws to protect the water. For example, the Environmental Protection Agency (EPA) was established, and the Clean Water Act was passed. Now, water is routinely tested. Pollution is

tracked to its source, and polluters are forced to fix the problem and clean up the pollution. They are also fined. These consequences have led industries, agriculture, and communities to pollute the water much less than before.

What You Can Do

Most water pollution comes from industry, agriculture, and municipal sources. Homes are part of the municipal source and the individuals and families that live in them can pollute the water supply. What can you do to reduce water pollution? Read the tips below.

- Properly dispose of motor oil and household chemicals. Never pour them down the drain. Also, don't let them spill on the ground. This keeps them out of storm sewers and bodies of water.
- Use fewer lawn and garden chemicals. Use natural products instead. For example, use compost instead of fertilizer. Or grow plants that can thrive on their own without any extra help.
- Repair engine oil leaks right away. A steady drip of oil from an engine can quickly add up to gallons. When the oil washes off driveways and streets it can end up in storm drains and pollute the water supply.
- Don't let pet litter or pet wastes get into the water supply (see **Figure 1.2**). The nitrogen they contain can cause overgrowth of algae. The wastes may also contain bacteria and other causes of disease.



FIGURE 1.2

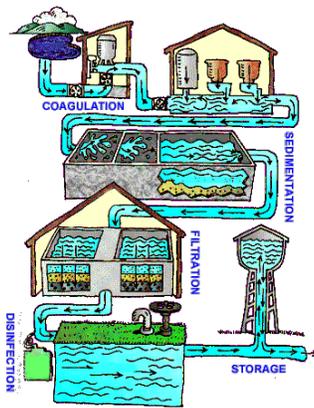
Why should people always clean up after their pets?

Water Treatment

Water treatment is a series of processes that remove unwanted substances from water. The goal of water treatment is to make the water safe to return to the natural environment or to the human water supply. Treating water for other purposes may not include all the same steps. That's because water used in agriculture or industry may not have to be as clean as drinking water.

You can see how water for drinking is treated in **Figure 1.3**. Treating drinking water requires at least four processes:

1. Chemicals are added to untreated water. They cause solids in the water to clump together. This is called coagulation.
2. The water is moved to tanks. The clumped solids sink to the bottom of the water. This is called sedimentation.
3. The water is passed through filters that remove smaller particles from the water. This is called filtration.
4. Chlorine is added to the water to kill bacteria and other microbes. This is called disinfection. Finally, the water is pure enough to drink.

**FIGURE 1.3**

Four processes are used to treat water to make it safe for drinking.

Conserving Water

Conserving water means using less of it. Of course, this mostly applies to people in the wealthy nations that have the most water and also waste the most.

Saving Water in Irrigation

Irrigation is the single biggest use of water. Overhead irrigation wastes a lot of water. Drip irrigation wastes a lot less. **Figure 1.4** shows a drip irrigation system. Water pipes run over the surface of the ground. Tiny holes in the pipes are placed close to each plant. Water slowly drips out of the holes and soaks into the soil around the plants. Very little of the water evaporates or runs off the ground.



FIGURE 1.4

The above is a drip irrigation system. Look at the soil in the photo. It's damp around each plant but dry everywhere else.

Rationing Water

Some communities save water with rationing. Much rationing takes place only during times of drought. During rationing, water may not be used for certain things. For example, communities may ban lawn watering and car washing. People may be fined if they use water in these ways. You can do your part. Follow any bans where you live.

Saving Water at Home

It's easy to save water at home. If you save even a few gallons a day you can make a big difference over the long run. The best place to start saving water is in the bathroom. Toilet flushing is the single biggest use of water in the home. Showers and baths are the next biggest use. Follow the tips below to save water at home.

- Install water-saving toilets. They use only about half as much water per flush. A single household can save up to 20,000 gallons a year with this change alone!

- Take shorter showers. You can get just as clean in 5 minutes as you can in 10. And you'll save up to 50 gallons of water each time you shower. That's thousands of gallons each year.
- Use low-flow shower heads. They use about half as much water as regular shower heads. They save thousands of gallons of water.
- Fix leaky shower heads and faucets. All those drips really add up. At one drip per second, more than 6,000 gallons go down the drain in a year —per faucet!
- Don't leave the water running while you brush your teeth. You could save as much as 10 gallons each time you brush. That could add up to 10,000 gallons in a year.
- Landscape your home with plants that need little water. This could result in a huge savings in water use. Look at the garden in **Figure 1.5**. It shows that you don't have to sacrifice beauty to save water.

**FIGURE 1.5**

This beautiful garden contains only plants that need very little water.

Lesson Summary

- Laws have been passed to control water pollution. In many places, water is cleaner now than it used to be. Everyone can help reduce water pollution. For example, they can keep motor oil and pet wastes out of the water supply.
- Water treatment is a series of processes that remove unwanted substances from water. More processes are needed to purify water for drinking than for other uses.
- There are many ways to use less water. For example, drip irrigation wastes less than other methods. Water-saving toilets and shower heads can save a lot of water at home.

Lesson Review Questions

Recall

1. Identify three ways that people can reduce water pollution at home.
2. List the processes used to treat drinking water.
3. What is filtration? What does it remove from water?