Reading Selection

Where Does Our Drinking Water Come From?

Have you been keeping track of how much water you use each day? Just think of all the ways you use water. You use it to wash your face after you get up in the morning. At school, you might stop by the water fountain for a cool drink. And there's nothing like a dip in the swimming pool on a hot summer day. You already know that each person in the United States uses an average of 350 liters of water (about 90 gallons) each day!

Most of the water on earth is found in oceans. We can't drink this water. Do you know why? Ocean water is very salty. Set out a pan of salt water in the sun. Over time, the water evaporates and salt is left behind. Scientists can remove salt from ocean water. But this process is expensive and takes a long time.

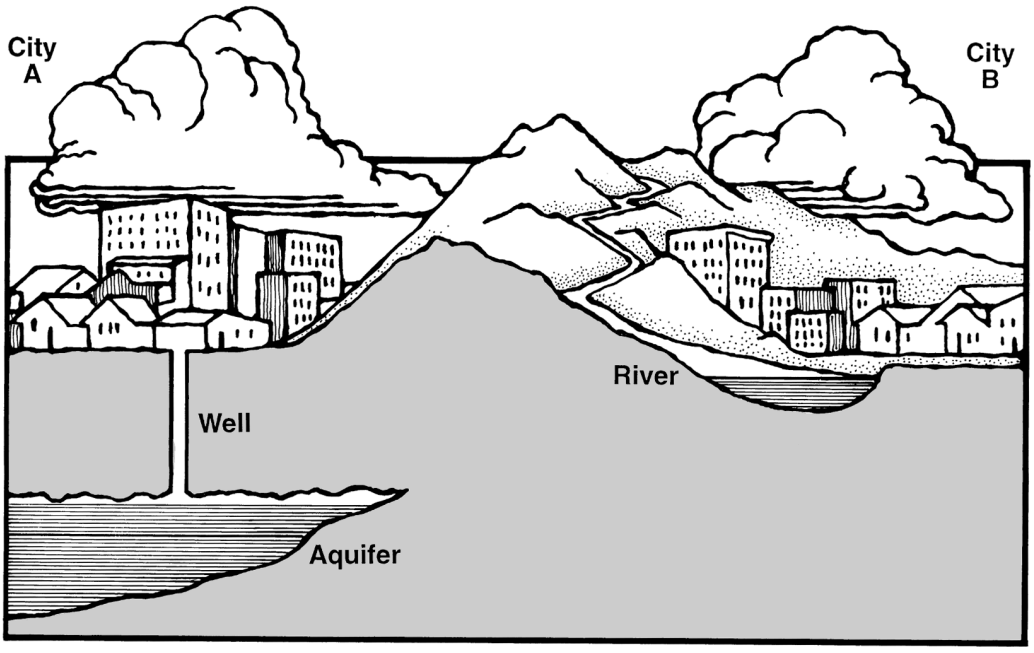
Our bodies need fresh water. Some fresh water comes from lakes and streams. These sources are called **surface waters.** Other fresh water is hidden underground. **Ground water** is water that has fallen to the earth as rain, snow, or other precipitation. It seeps through layers of sand, gravel, and other earth materials known as **aquifers** (say ah-kwi-ferz). The water stops when it reaches a layer of rock or other hard material. Look at your stream table from underneath. Do you see any water beneath the soil?

How Do We Get Our Water?

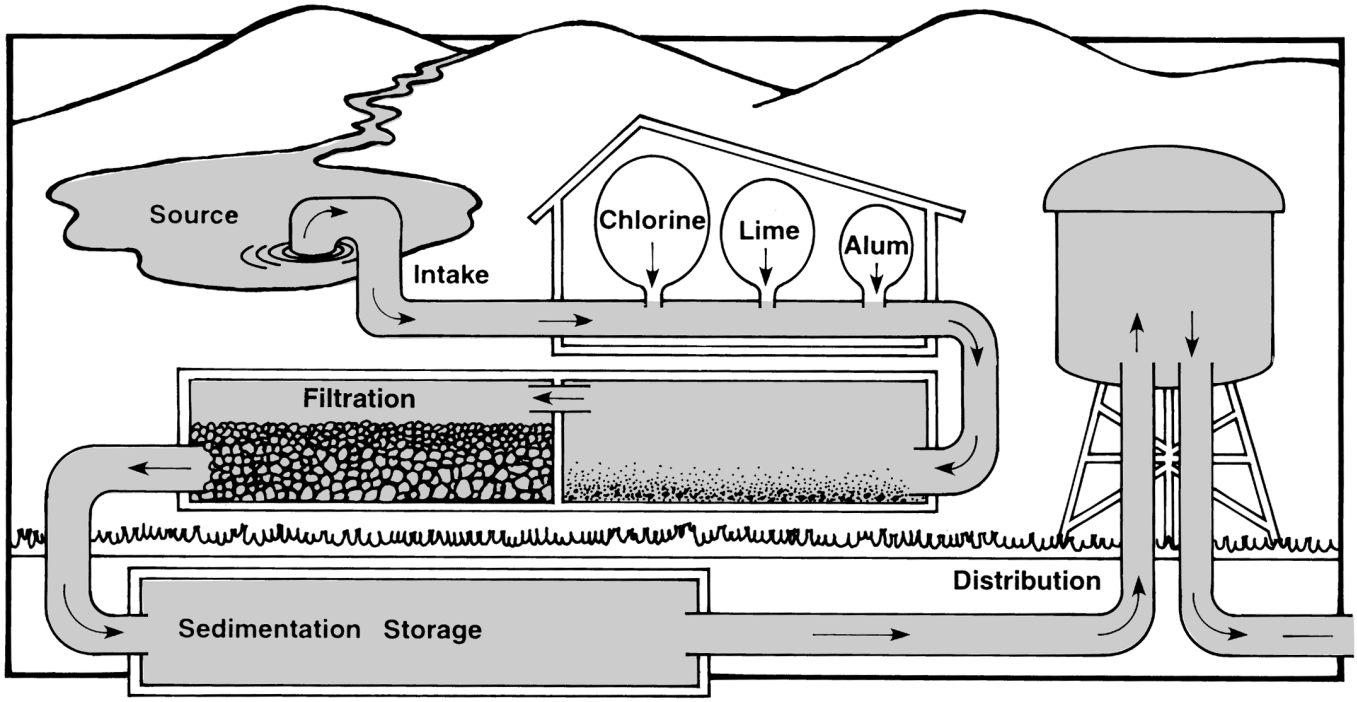
If you live in a city or town, you probably get your water from a public utility company. Utility companies pump water to your home either from surface waters or aquifers.

Sometimes utility companies must send the water from lakes or rivers through pipes for hundreds of miles. The pipes that bring water to a big city may be wide enough for you to stand in. In fact, the water tunnels in New York City are so large you could drive a truck through them!

If you live far from the city, you probably get your water from a well drilled in the ground.



Water sources



Filtering water at a treatment plant

Well drillers are workers who make holes deep into the earth until they find water. Sometimes a well can be more than 305 m (1,000 ft) deep! After the well is drilled, the driller puts a plastic or steel pipe that looks like a giant drinking straw into the hole. This keeps the soil and rock from caving in. Then the well driller attaches an electric pump to the pipe. The pump forces the water that has seeped into the pipe upward, through the pipe, and into your house.

Cleaning the Water

Have you ever poured sandy water through a strainer at the beach? The strainer is like a **filter.** It separates some of the sand from the water. You might say it helps to clean the water.

The land can be a filter, too. As water seeps through the soil, layers of sand and gravel clean the water. People can usually drink spring water, which has been underground, just the way it is.

Surface waters, however, usually are not clean. Do you remember what the water in your catch bucket looked like? It was very dirty because of sediment. When water flows over land, it wears away soil and rock and carries the particles along. This is called **erosion.** Pollutants—like fertilizer, road salt, and other chemicals—can get into both surface water and ground water. Then the water is not safe to drink.

Utility companies must clean the water before people can use it. In treatment plants, utility companies add certain chemicals to the water. For example, chlorine gets rid of bacteria that might harm you. Alum makes particles clump together and sink to the bottom. This is called **sedimentation.** After the sediment is removed, the water passes through layers of sand and gravel. These layers filter the water and remove smaller particles. This is called **filtration.** Before the water can be stored or distributed to homes and businesses, utility plant workers bubble air through the water to make it taste fresh. Many utility companies add fluoride to the water, too. This helps keep your teeth from getting cavities.

Getting the Clean Water to You

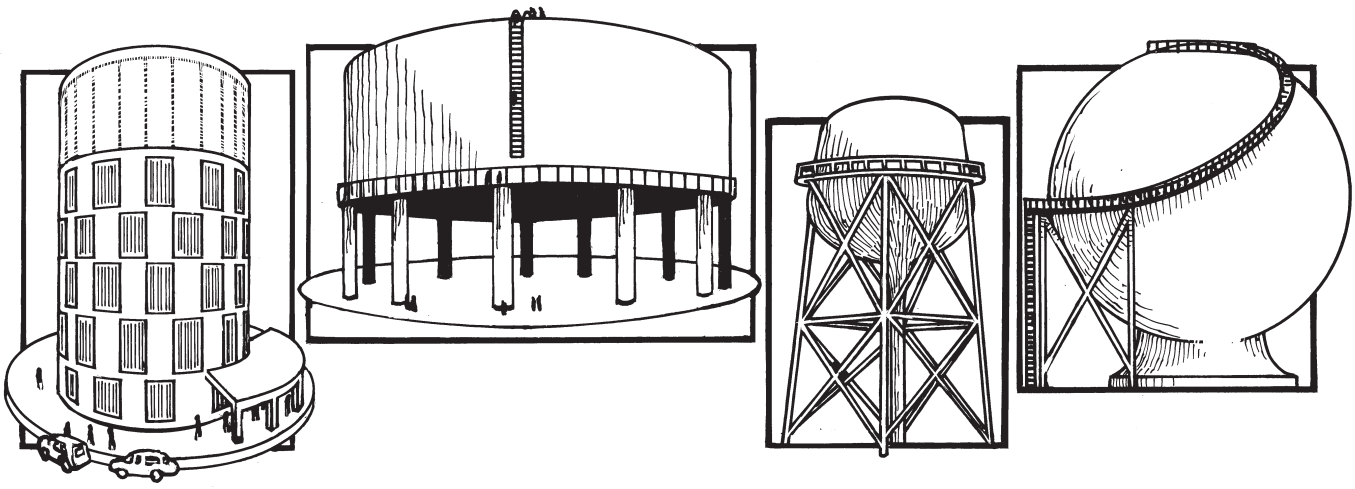
Have you ever noticed a water tower in your town or on top of a building? Utility companies use water towers to store clean water until you are ready to use it.

Why do you think water towers are so tall? Think of pouring water from a cup. The higher you hold the cup, the bigger the splash. That is because the **water pressure** is greater when the water falls from a greater height.

When water is released from the tower, the pressure of the water pushes it down and through pipes. The pipes carry the water directly to your home, offices, and other buildings.

Conserving Our Water

What happens to the water we use after it disappears down the drain? This **wastewater** must be cleaned before we can use it again. Cleaning our water costs money and takes time. Clean water is a limited resource. We must be careful not to waste it. Continue to keep track of how much water you use each day. Then decide if you are using it wisely.



Water towers

Record Sheet 6-A

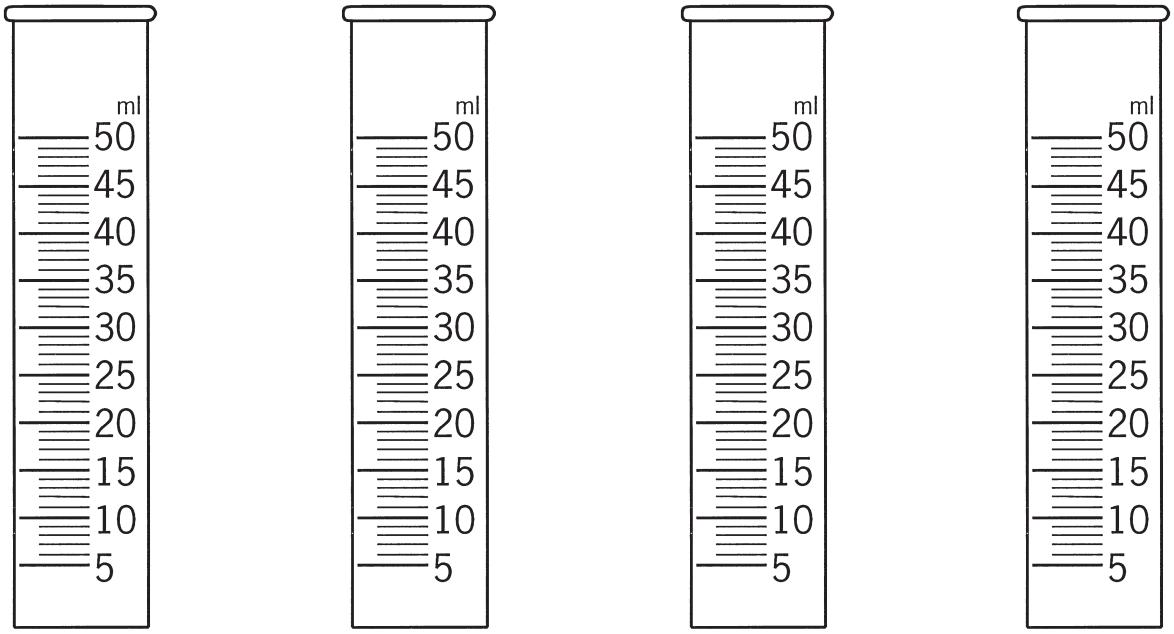
Name(s): _____

Group: _____ Date: _____

Testing Pore Space in Earth Materials

1. Pour a different soil component into each cylinder. Pack the soil down with the chopstick until it is at the 20-ml mark. Ask for more soil if you need it. Draw the soil as it looks in each cylinder. (Use a crayon that matches the color of the soil.)

Sand **Clay** **Gravel** **Humus**



2. Pour onto a paper towel any extra soil left in your cup.

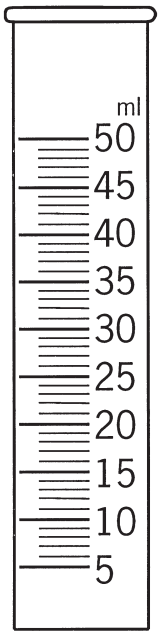
3. Make a prediction. If you added 30 ml (1 oz) of water to each cylinder, what do you think would be the total volume of soil and water in the cylinder? Use a blue crayon to draw where you think the water will be in each cylinder.

4. Fill each empty small cup with 30 ml (1 oz) of water. Pour 30 ml of water into each cylinder of soil. After 5 minutes, draw how the water and soil look in each cylinder. Use the cylinders on the next page to record the total volume.

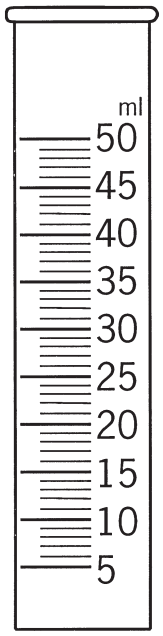
Record Sheet 6-A Name(s): _____

Testing Pore Space in Earth Materials, *continued*

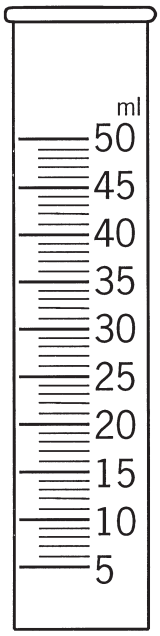
Sand and Water



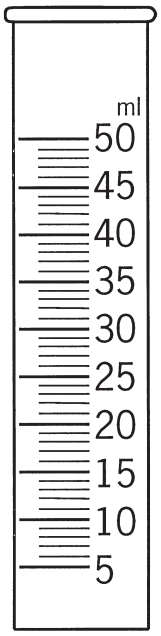
Clay and Water



Gravel and Water



Humus and Water



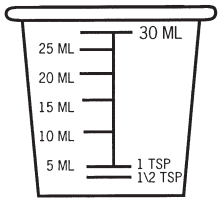
5. Where did the 30 ml of water go when you added it to each soil type? Why do you think this happened?

_____

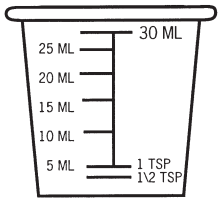
_____

6. Now pour the water out of each cylinder and back into its cup. How much water is in the cup? Show the water level in the four cups pictured below.

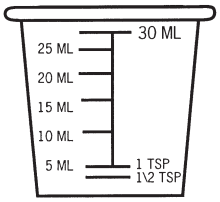
Water from Sand



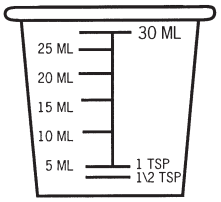
Water from Clay



Water from Gravel



Water from Humus



7. Did you get 30 ml of water back from each cylinder? Why do you think this happened?

_____

_____