EM4855

Wally Otter Says:

we really 'otter'

COLORING BOOK

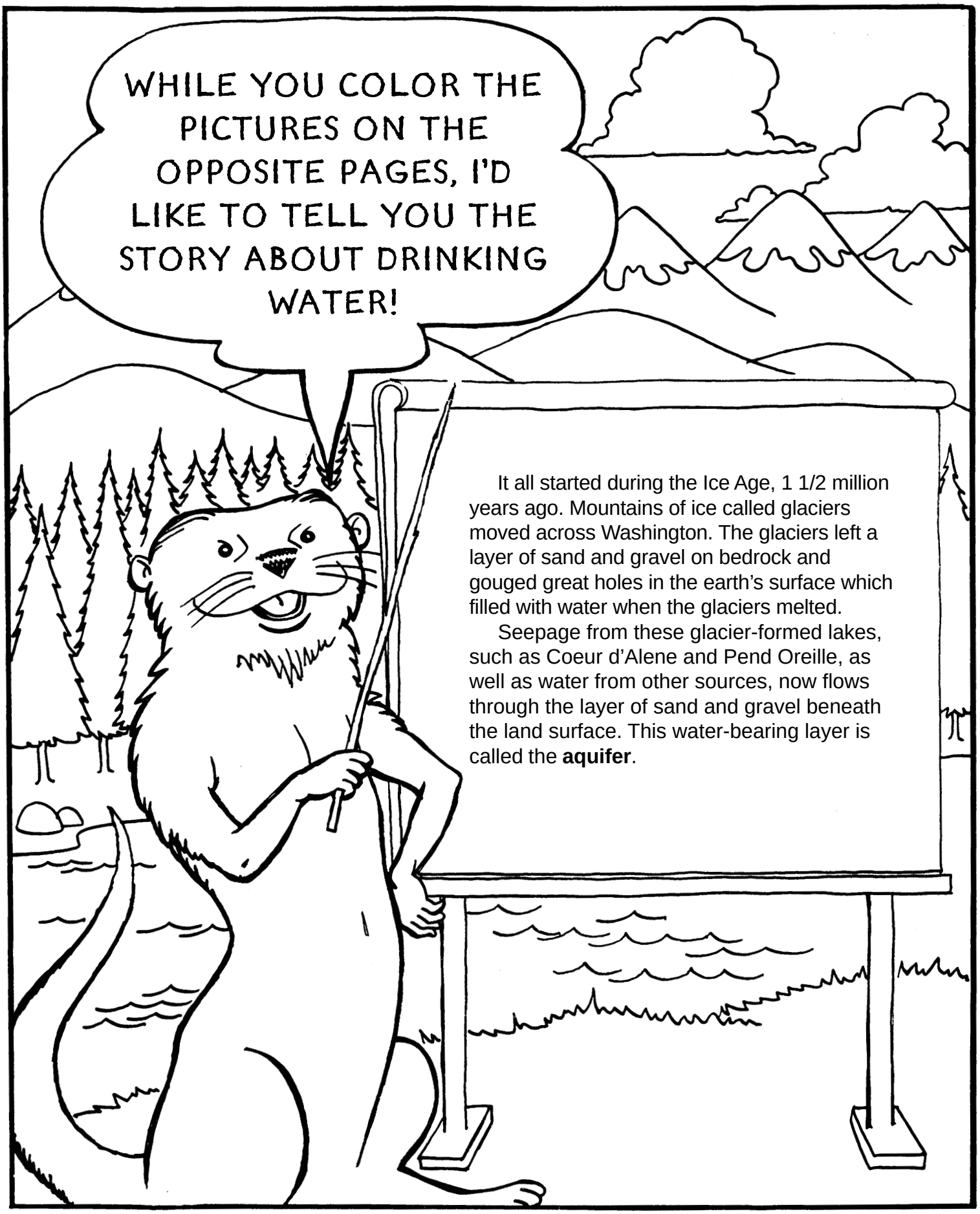
COOPERATIVE EXTENSION
WASHINGTON STATE UNIVERSITY

By Marion E. Hay and Richard E. Hoover

Adapted by Jerry A. Newman, Extension Youth Development Specialist and Edward B. Adams, Extension Water Quality Agent

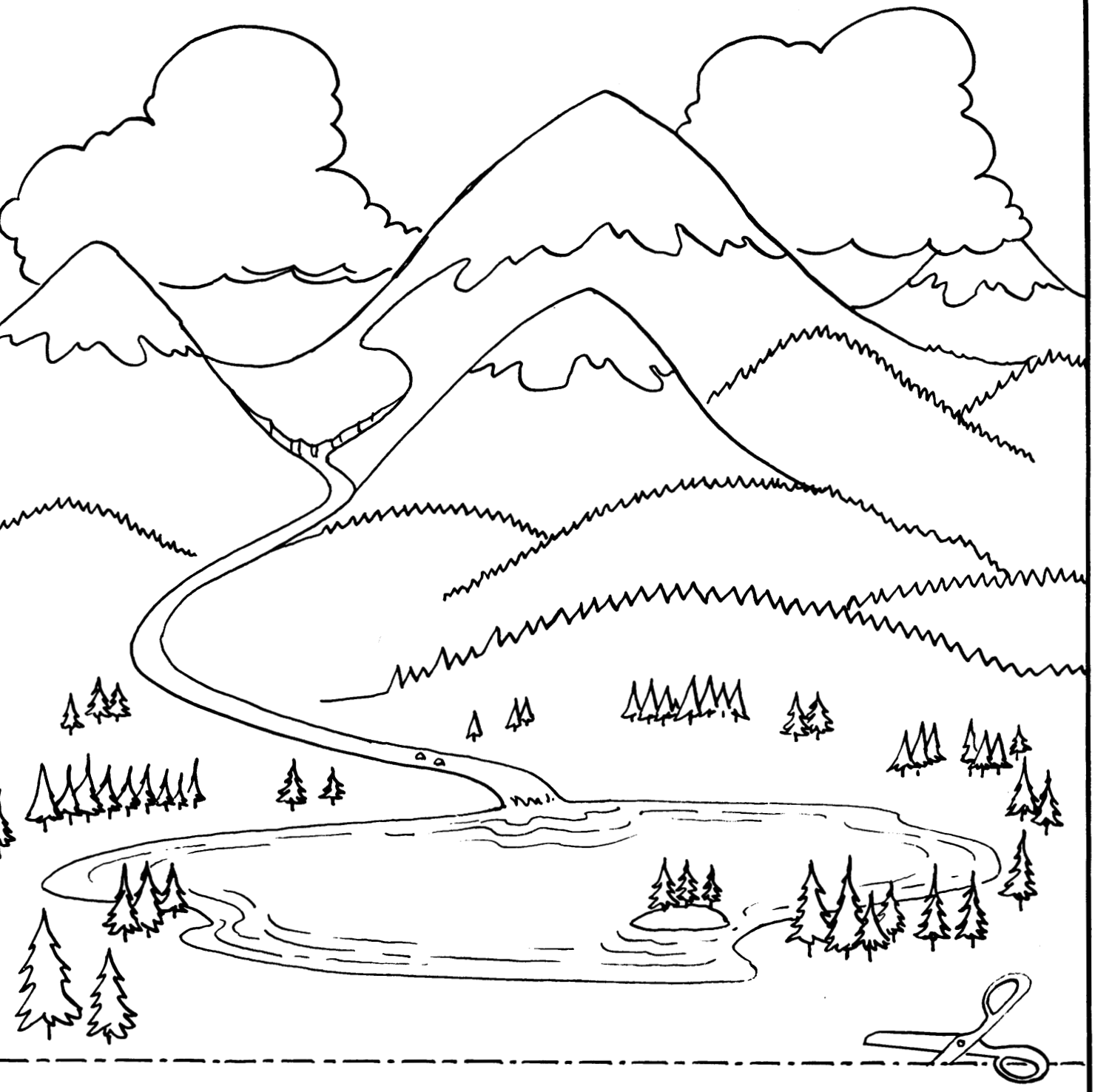
Dedicated to Marion Hay and the children he loved, who will be responsible for protecting the state's water in the future.

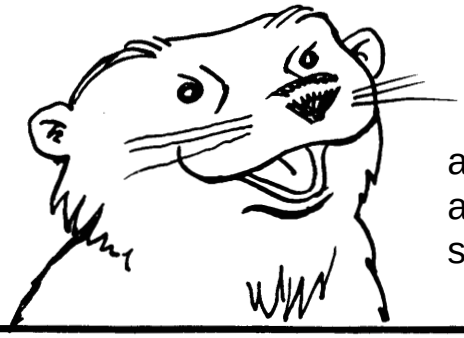
Adapted with permission from the Washington State Department of Ecology.



It all started during the Ice Age, 1 1/2 million years ago. Mountains of ice called glaciers moved across Washington. The glaciers left a layer of sand and gravel on bedrock and gouged great holes in the earth's surface which filled with water when the glaciers melted.

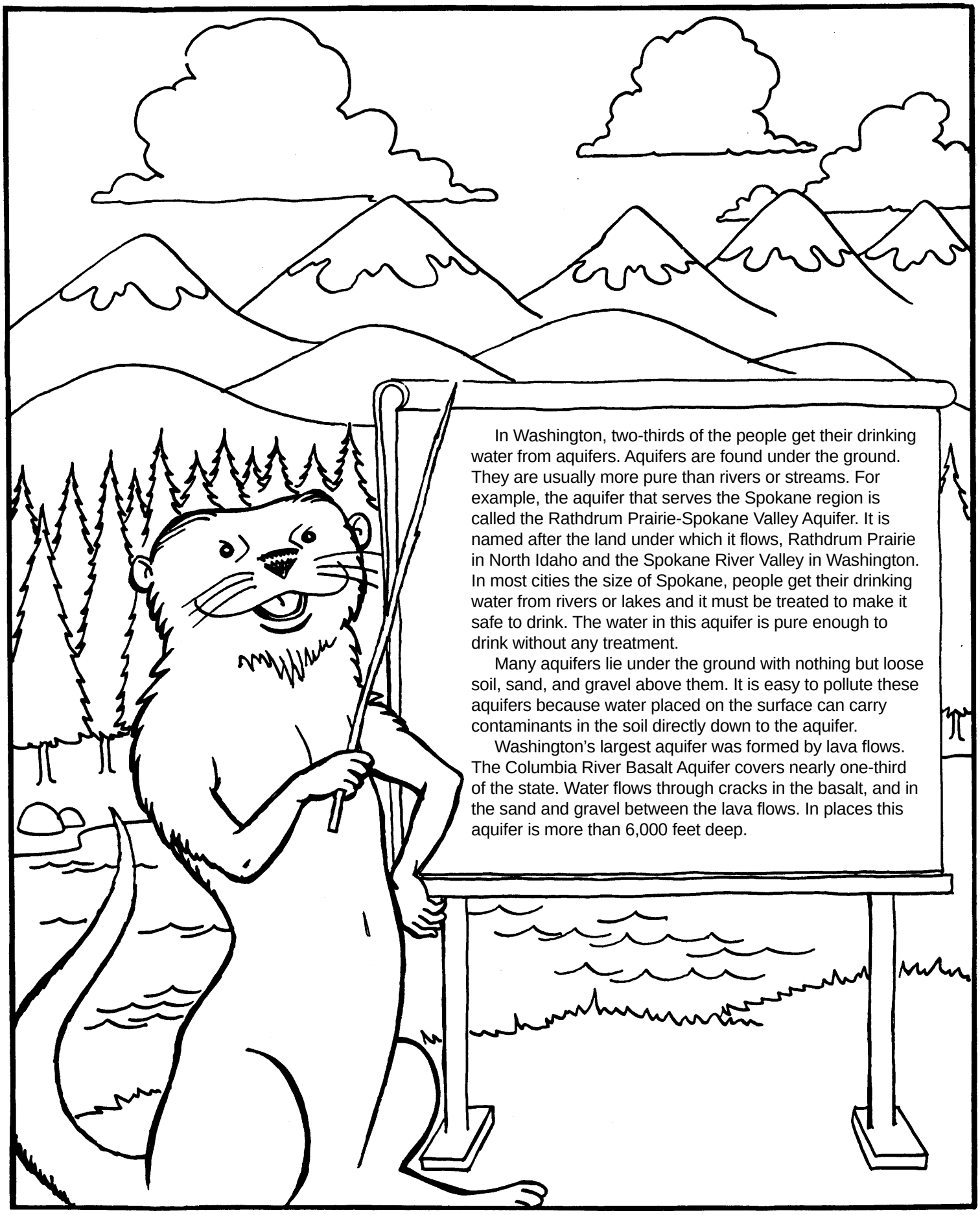
Seepage from these glacier-formed lakes, such as Coeur d'Alene and Pend Oreille, as well as water from other sources, now flows through the layer of sand and gravel beneath the land surface. This water-bearing layer is called the **aquifer**.

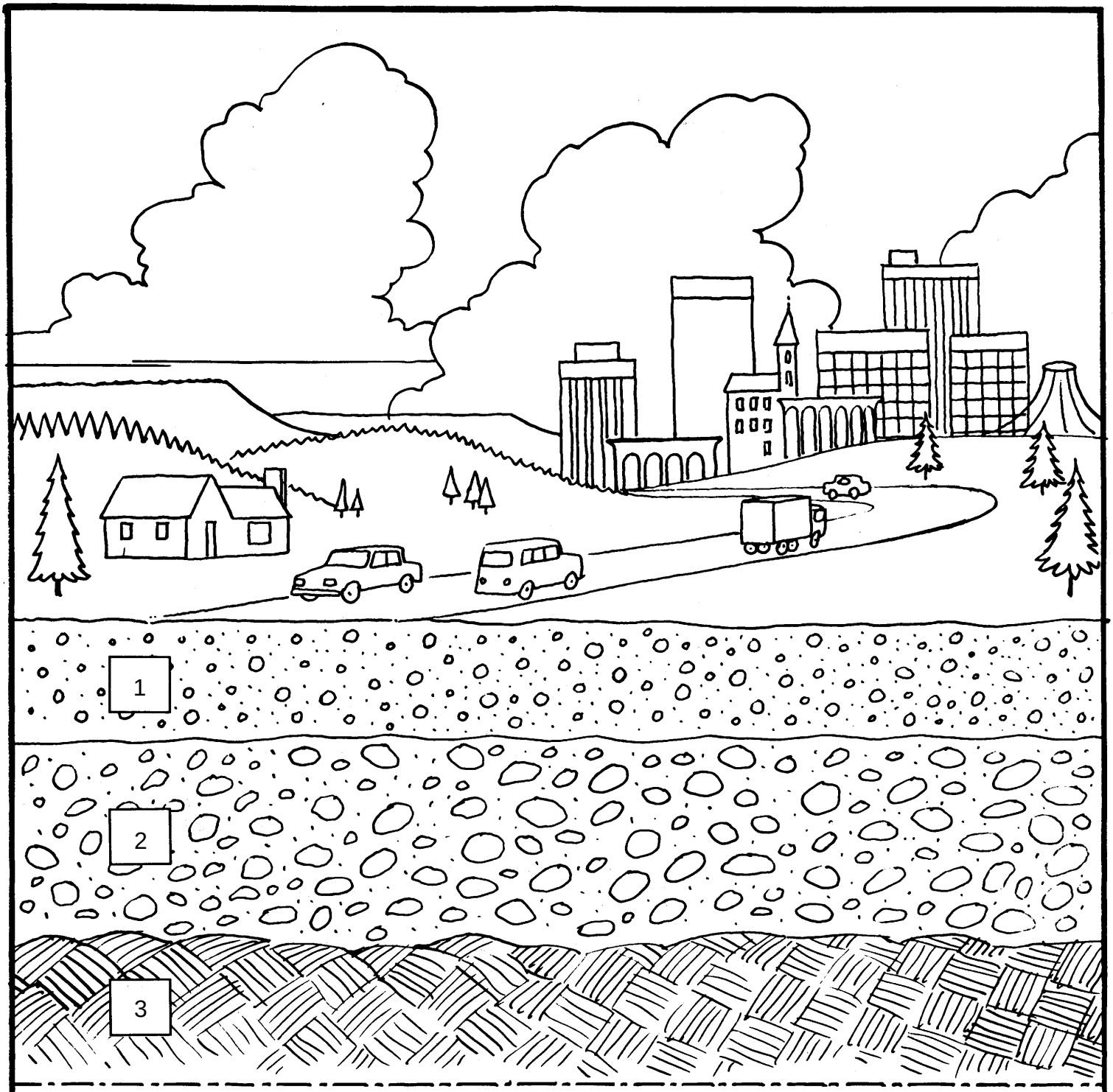




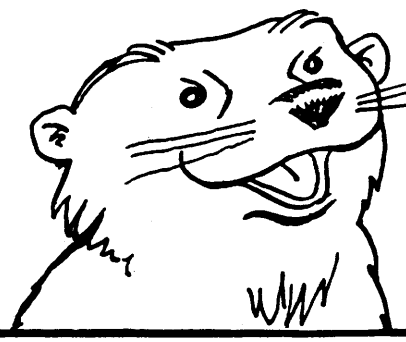
Glaciers Formed Our Lakes

Glaciers scraped out huge cavities, which are now lakes, and deposited a layer of sand and gravel on bedrock. Seepage from the lakes and other sources now fills the layer of sand and gravel with water, and this is called the **aquifer**.

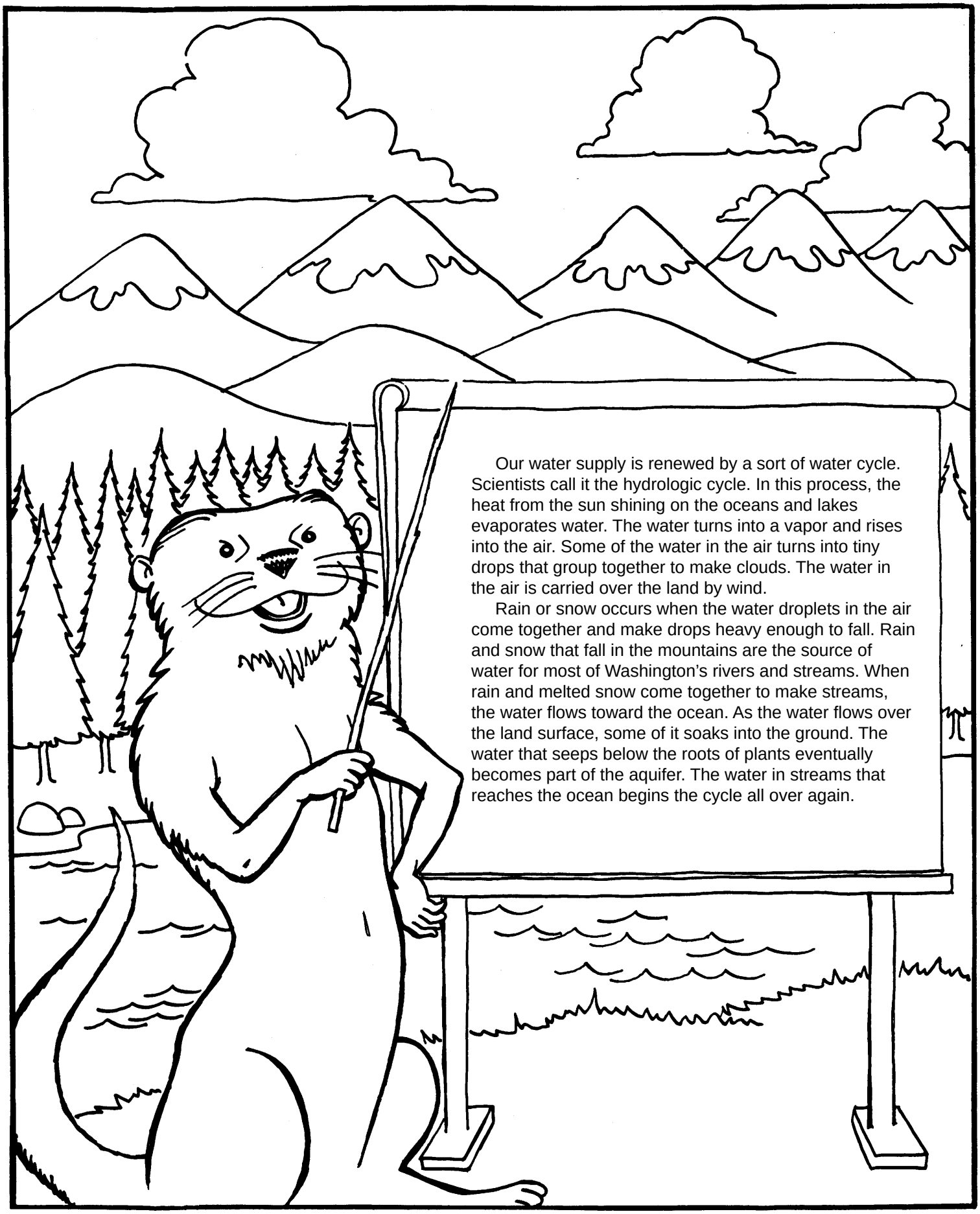

In Washington, two-thirds of the people get their drinking water from aquifers. Aquifers are found under the ground. They are usually more pure than rivers or streams. For example, the aquifer that serves the Spokane region is called the Rathdrum Prairie-Spokane Valley Aquifer. It is named after the land under which it flows, Rathdrum Prairie in North Idaho and the Spokane River Valley in Washington. In most cities the size of Spokane, people get their drinking water from rivers or lakes and it must be treated to make it safe to drink. The water in this aquifer is pure enough to drink without any treatment.
Many aquifers lie under the ground with nothing but loose soil, sand, and gravel above them. It is easy to pollute these aquifers because water placed on the surface can carry contaminants in the soil directly down to the aquifer.
Washington's largest aquifer was formed by lava flows. The Columbia River Basalt Aquifer covers nearly one-third of the state. Water flows through cracks in the basalt, and in the sand and gravel between the lava flows. In places this aquifer is more than 6,000 feet deep.



The Aquifer Is Underground

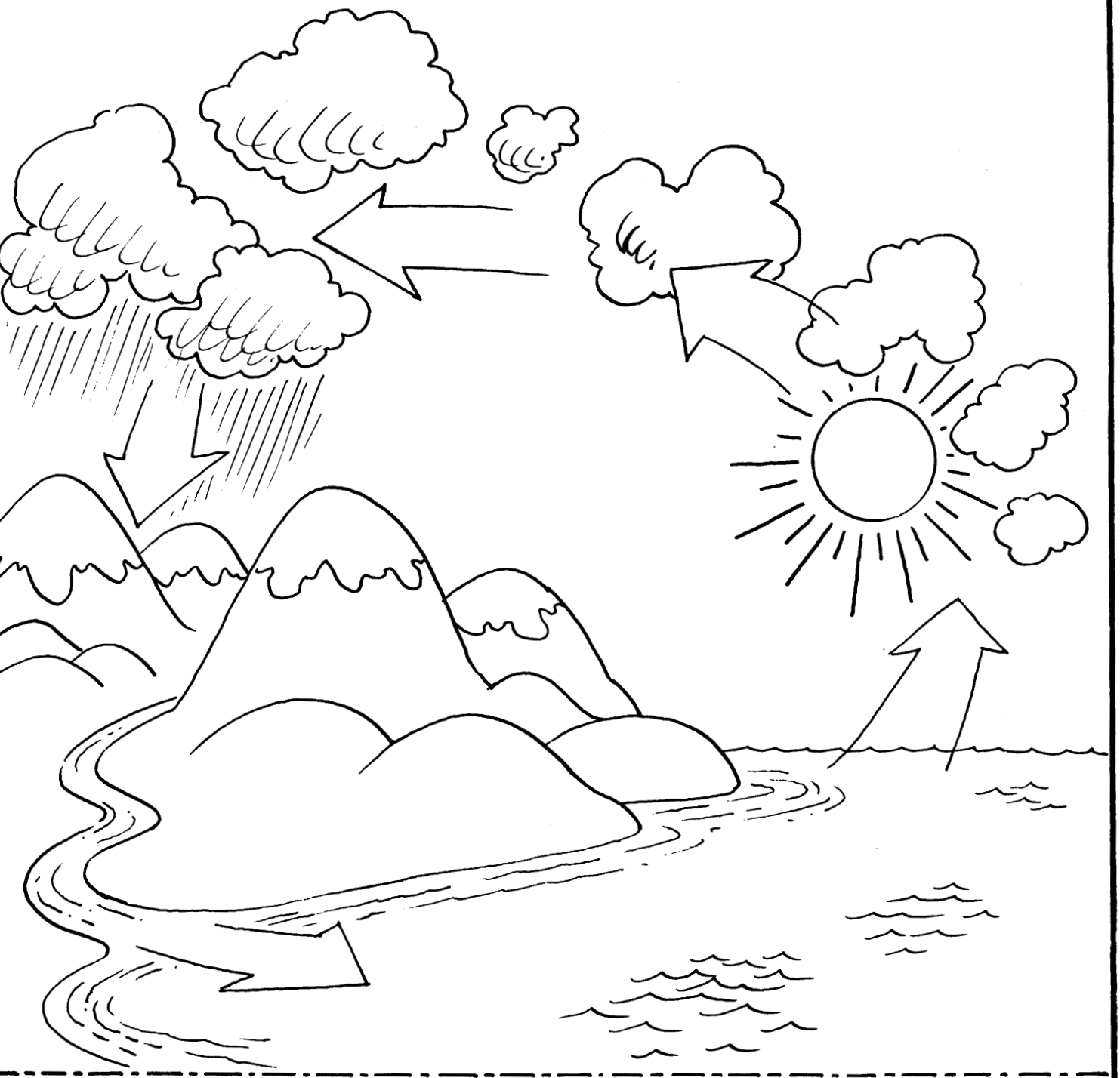


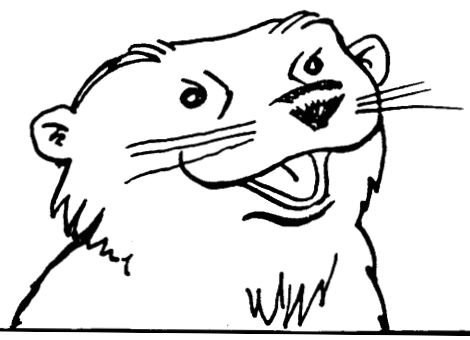
This is a cut-away view of the earth under a town with an aquifer. It shows: (1) **loose soil and gravel** just under the surface; (2) **the aquifer**, a water-bearing layer of sand and gravel, from which the residents get their water; and (3) **bedrock**, solid rock that forms a nonleaking bottom for the aquifer.



Our water supply is renewed by a sort of water cycle. Scientists call it the hydrologic cycle. In this process, the heat from the sun shining on the oceans and lakes evaporates water. The water turns into a vapor and rises into the air. Some of the water in the air turns into tiny drops that group together to make clouds. The water in the air is carried over the land by wind.

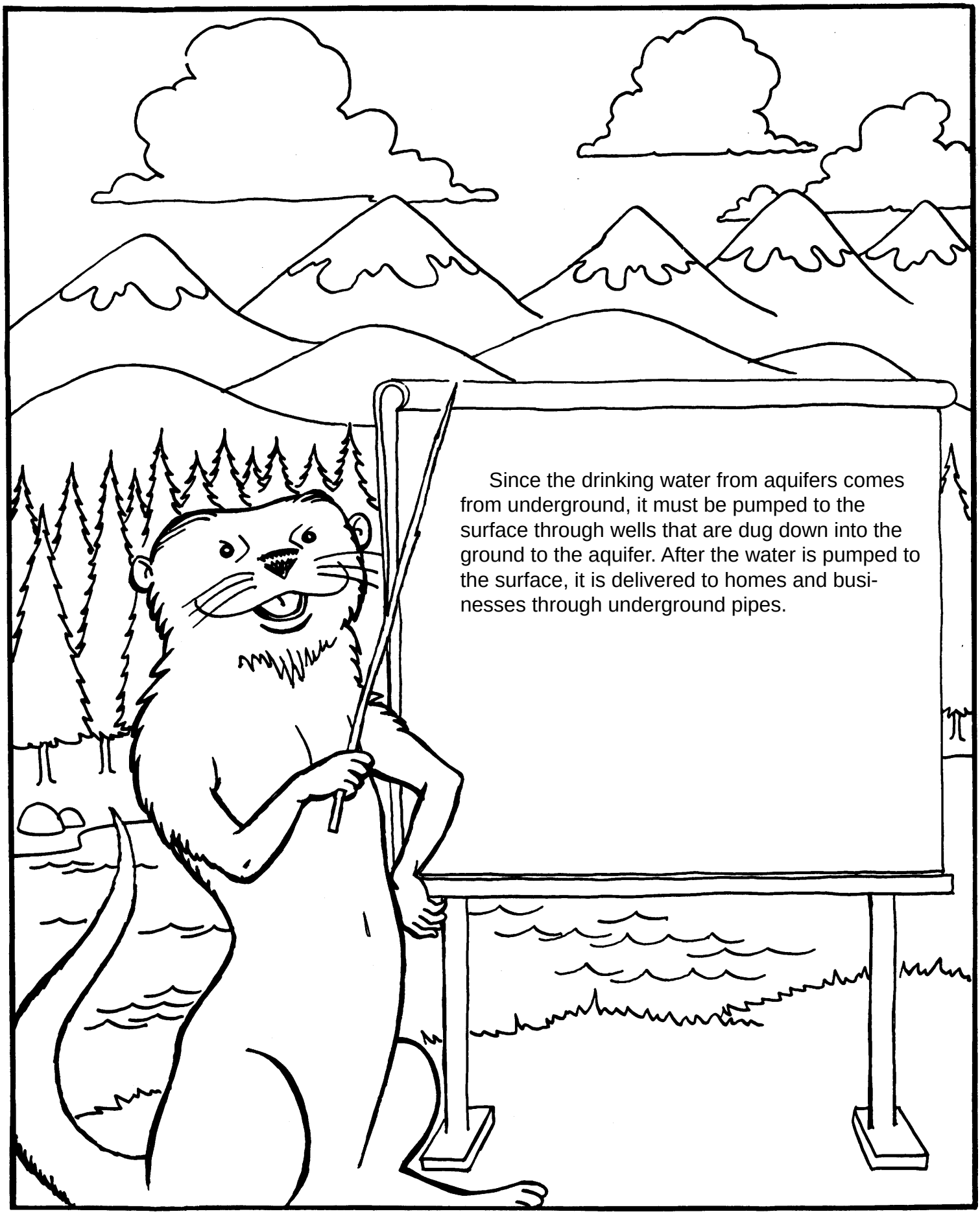
Rain or snow occurs when the water droplets in the air come together and make drops heavy enough to fall. Rain and snow that fall in the mountains are the source of water for most of Washington's rivers and streams. When rain and melted snow come together to make streams, the water flows toward the ocean. As the water flows over the land surface, some of it soaks into the ground. The water that seeps below the roots of plants eventually becomes part of the aquifer. The water in streams that reaches the ocean begins the cycle all over again.

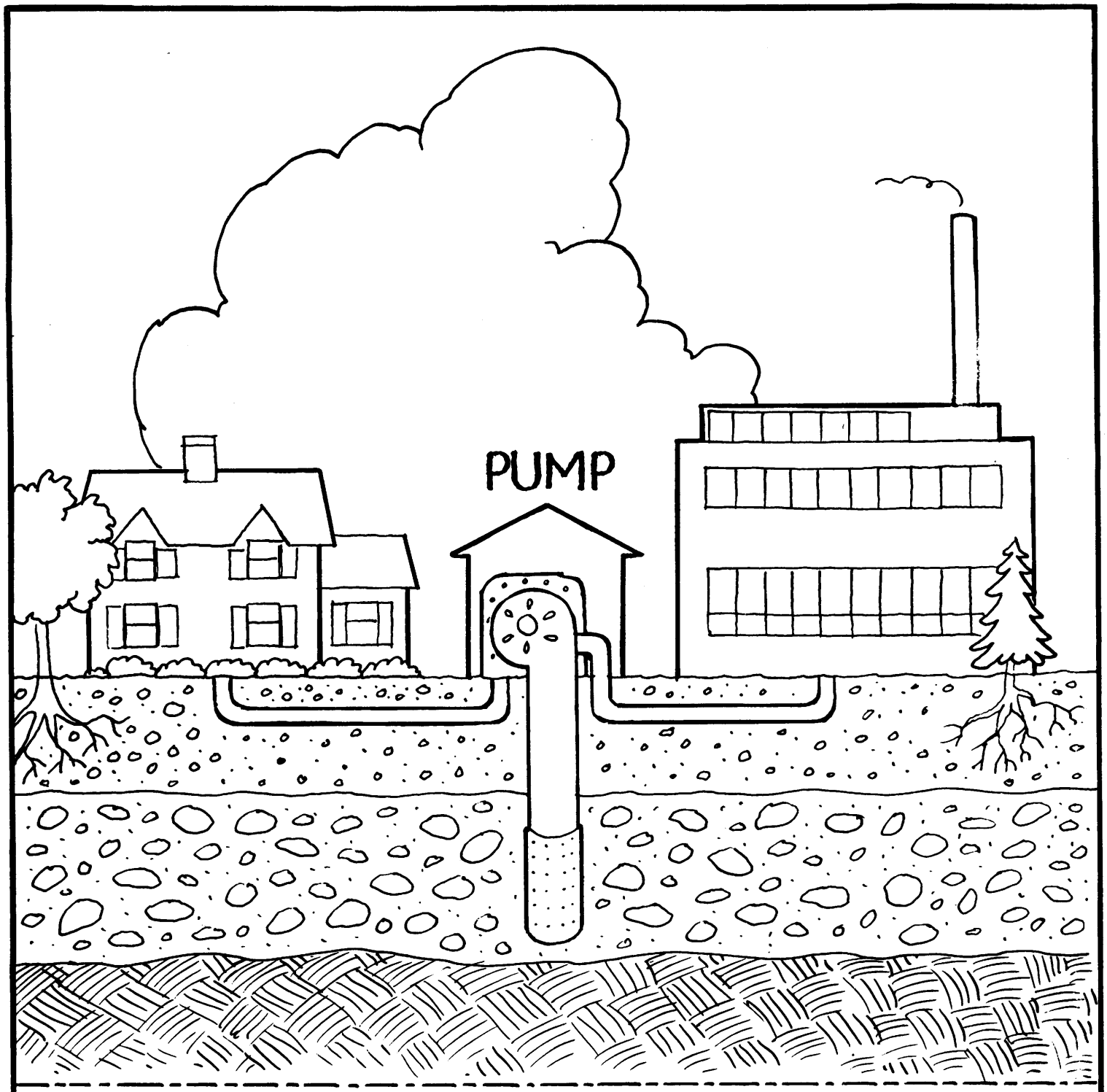


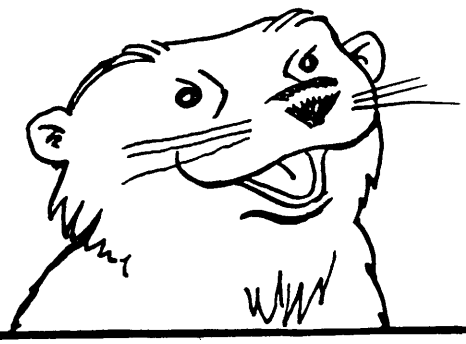


The Hydrologic Cycle Recycles Water

Water evaporates from oceans and lakes, and forms clouds that are carried by wind over the land. Eventually, water in the clouds falls to earth as rain or snow, forms rivers, and then flows back to the oceans—where the cycle begins all over again.

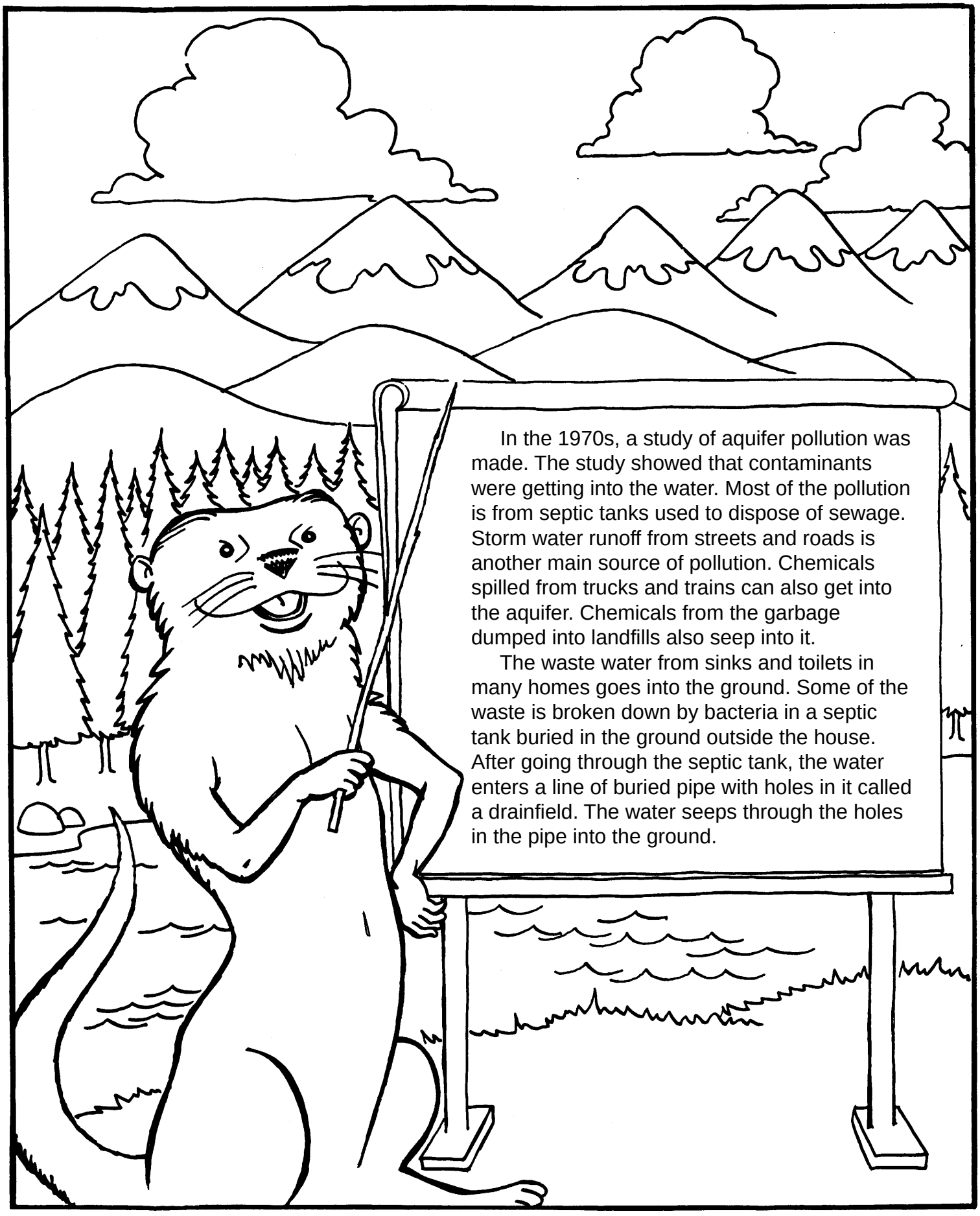

Since the drinking water from aquifers comes from underground, it must be pumped to the surface through wells that are dug down into the ground to the aquifer. After the water is pumped to the surface, it is delivered to homes and businesses through underground pipes.





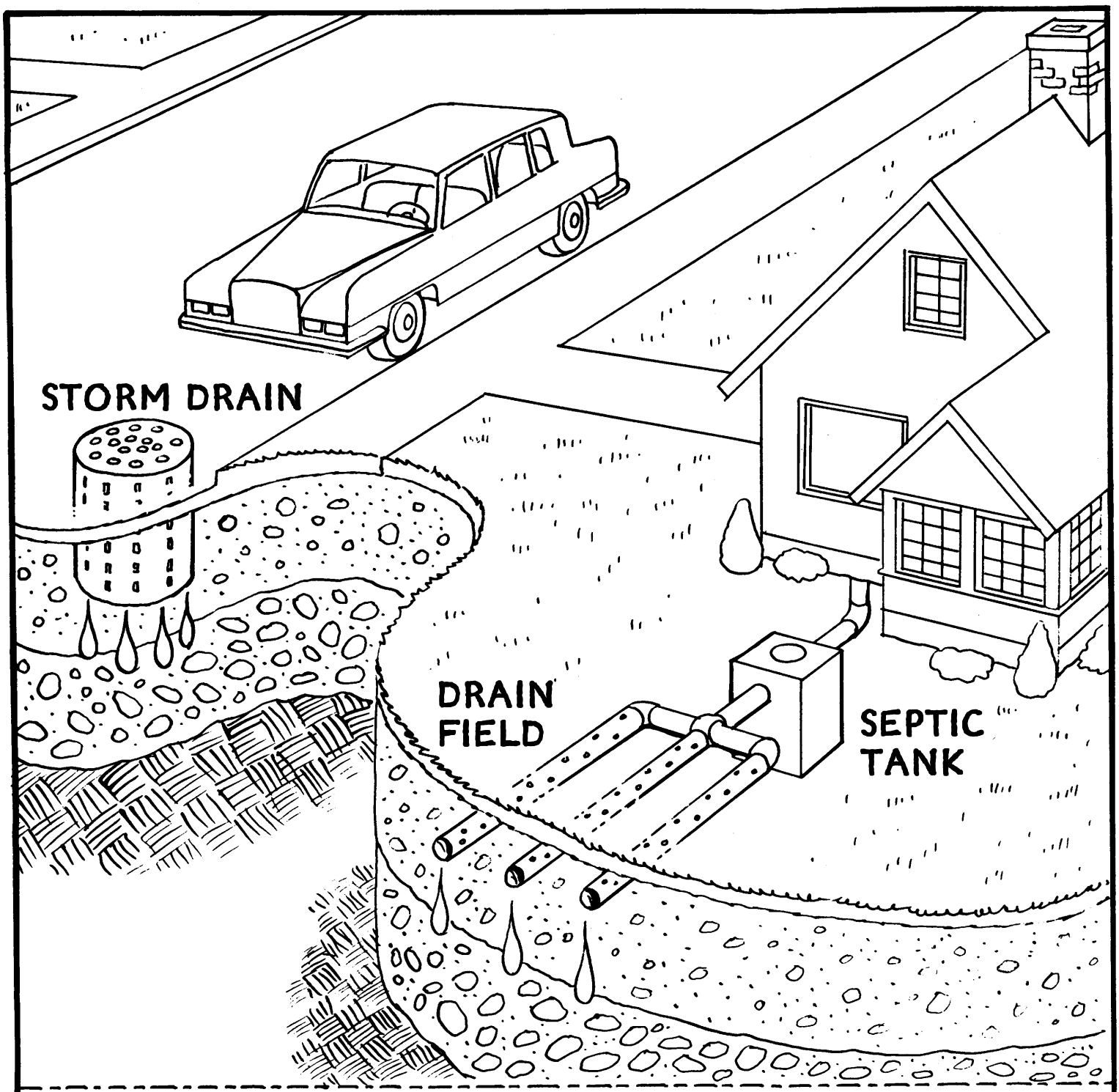
Water Is Pumped from Wells

Drinking water is pumped from the aquifer through wells and then piped to homes and businesses.

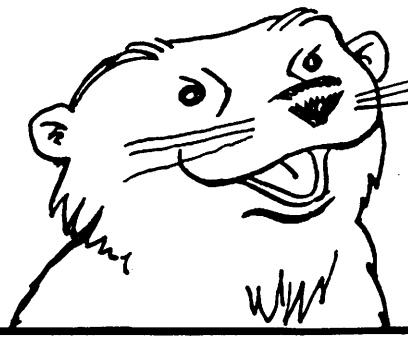


In the 1970s, a study of aquifer pollution was made. The study showed that contaminants were getting into the water. Most of the pollution is from septic tanks used to dispose of sewage. Storm water runoff from streets and roads is another main source of pollution. Chemicals spilled from trucks and trains can also get into the aquifer. Chemicals from the garbage dumped into landfills also seep into it.

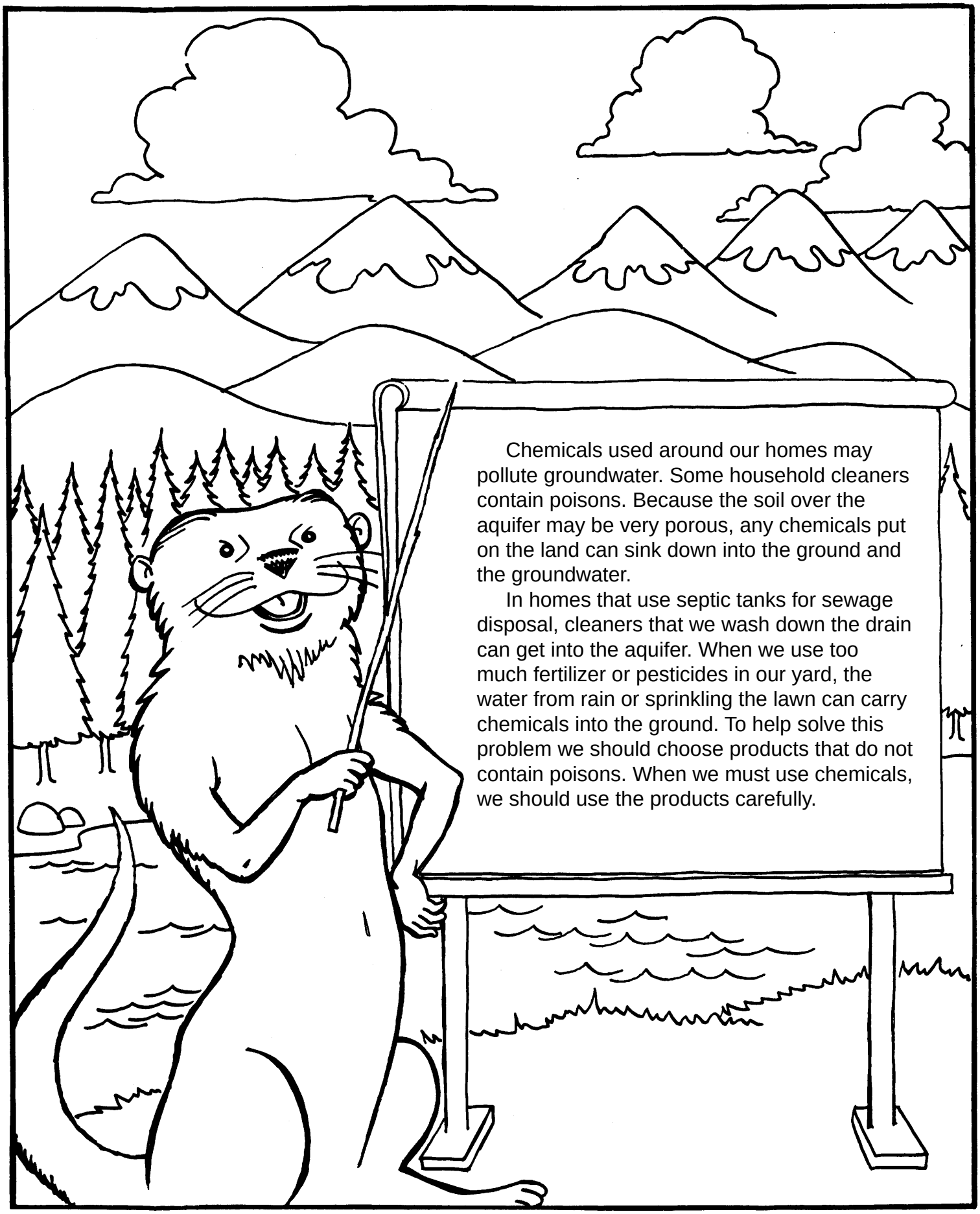
The waste water from sinks and toilets in many homes goes into the ground. Some of the waste is broken down by bacteria in a septic tank buried in the ground outside the house. After going through the septic tank, the water enters a line of buried pipe with holes in it called a drainfield. The water seeps through the holes in the pipe into the ground.

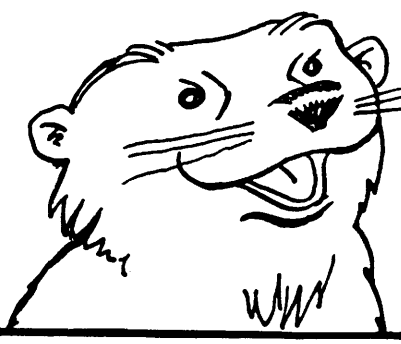


Septic Tanks and Storm Drains Add Pollutants



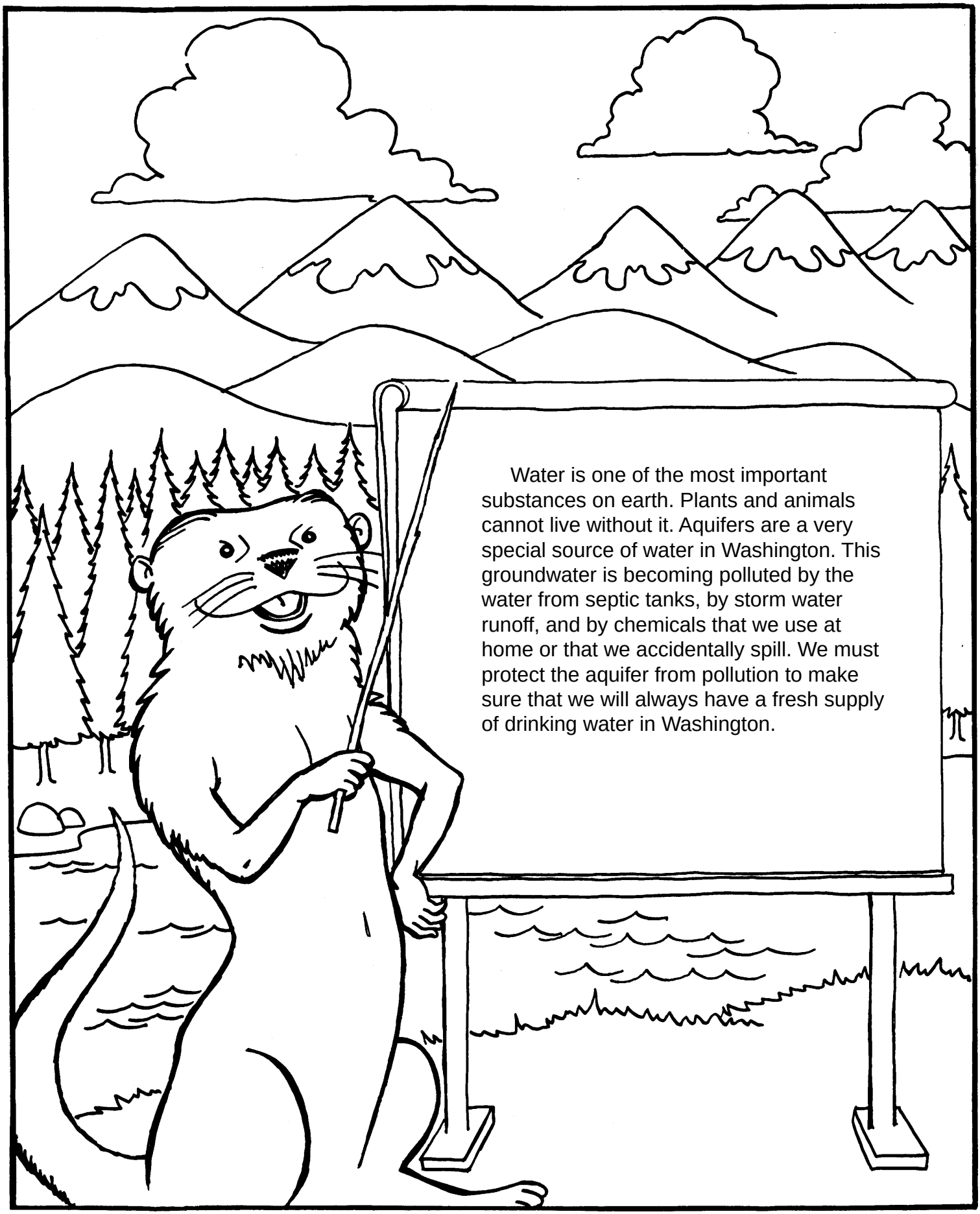
Studies have shown that pollutants are getting into the aquifer, mainly from septic tanks (used to dispose of sewage) and from storm water runoff from streets.


Chemicals used around our homes may pollute groundwater. Some household cleaners contain poisons. Because the soil over the aquifer may be very porous, any chemicals put on the land can sink down into the ground and the groundwater.
In homes that use septic tanks for sewage disposal, cleaners that we wash down the drain can get into the aquifer. When we use too much fertilizer or pesticides in our yard, the water from rain or sprinkling the lawn can carry chemicals into the ground. To help solve this problem we should choose products that do not contain poisons. When we must use chemicals, we should use the products carefully.



Use Care About What Is Poured on the Ground

Things that should not be dumped onto the ground include: leftover paint, paint thinner, motor oil, and all kinds of substances that are used to kill weeds and bugs. (Small amounts of pesticides are not considered a major problem.)

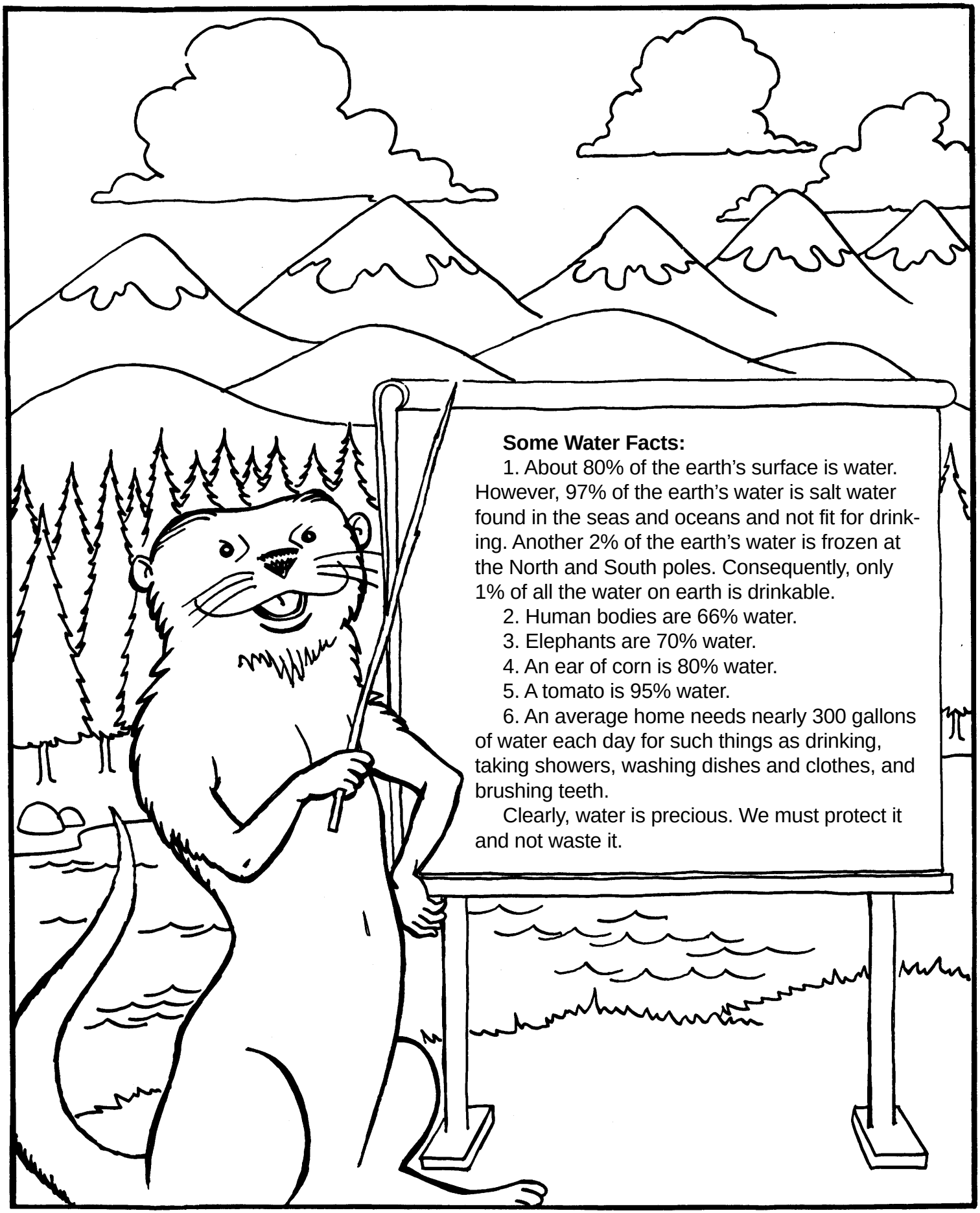

Water is one of the most important substances on earth. Plants and animals cannot live without it. Aquifers are a very special source of water in Washington. This groundwater is becoming polluted by the water from septic tanks, by storm water runoff, and by chemicals that we use at home or that we accidentally spill. We must protect the aquifer from pollution to make sure that we will always have a fresh supply of drinking water in Washington.

Name _____

Grade _____

Draw and Color Your Own Picture

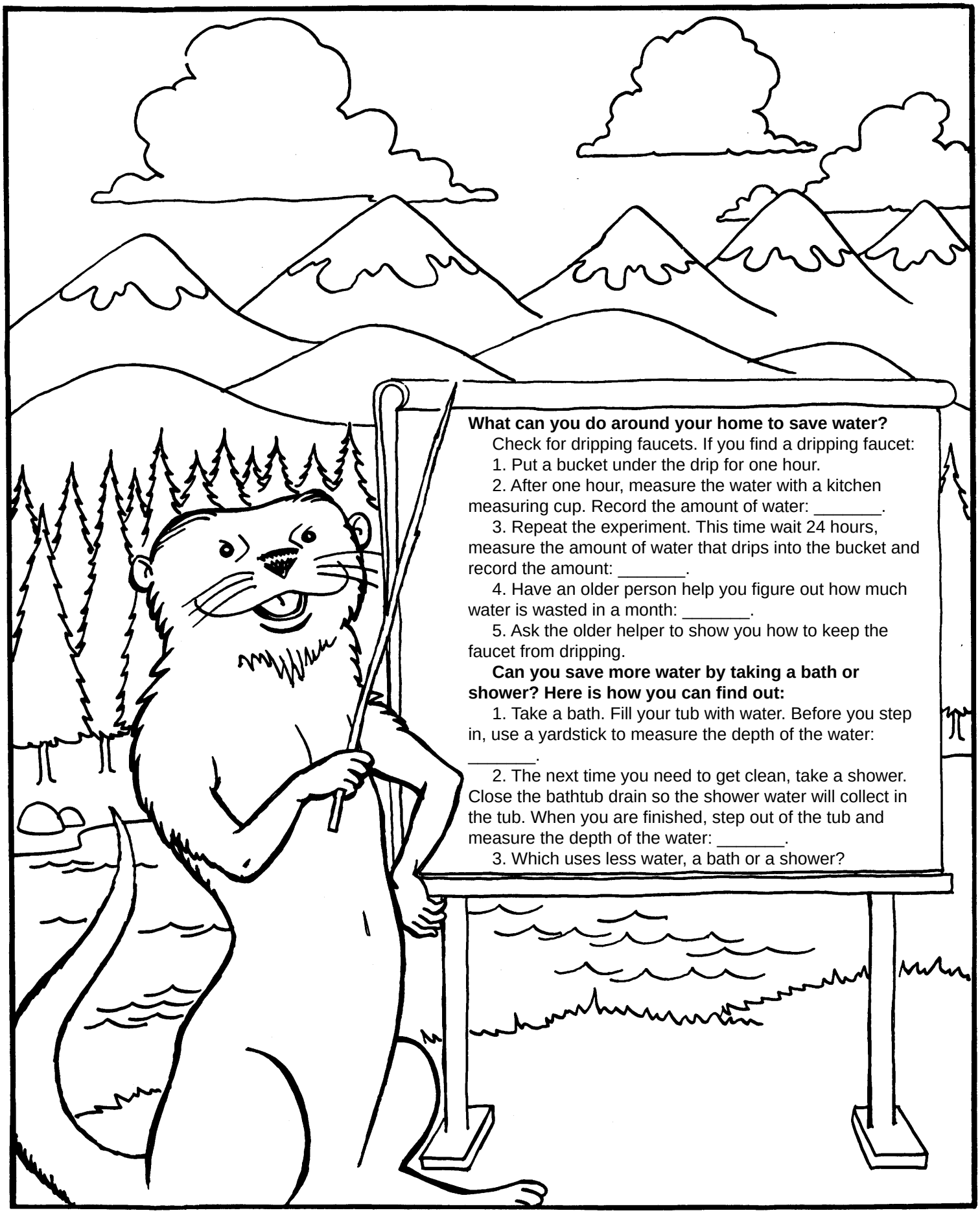
Now that you know about the aquifer, use the above space to draw and color a poster that would remind people that “We really ‘otter’ protect our water.” Cut out and save your poster drawing.

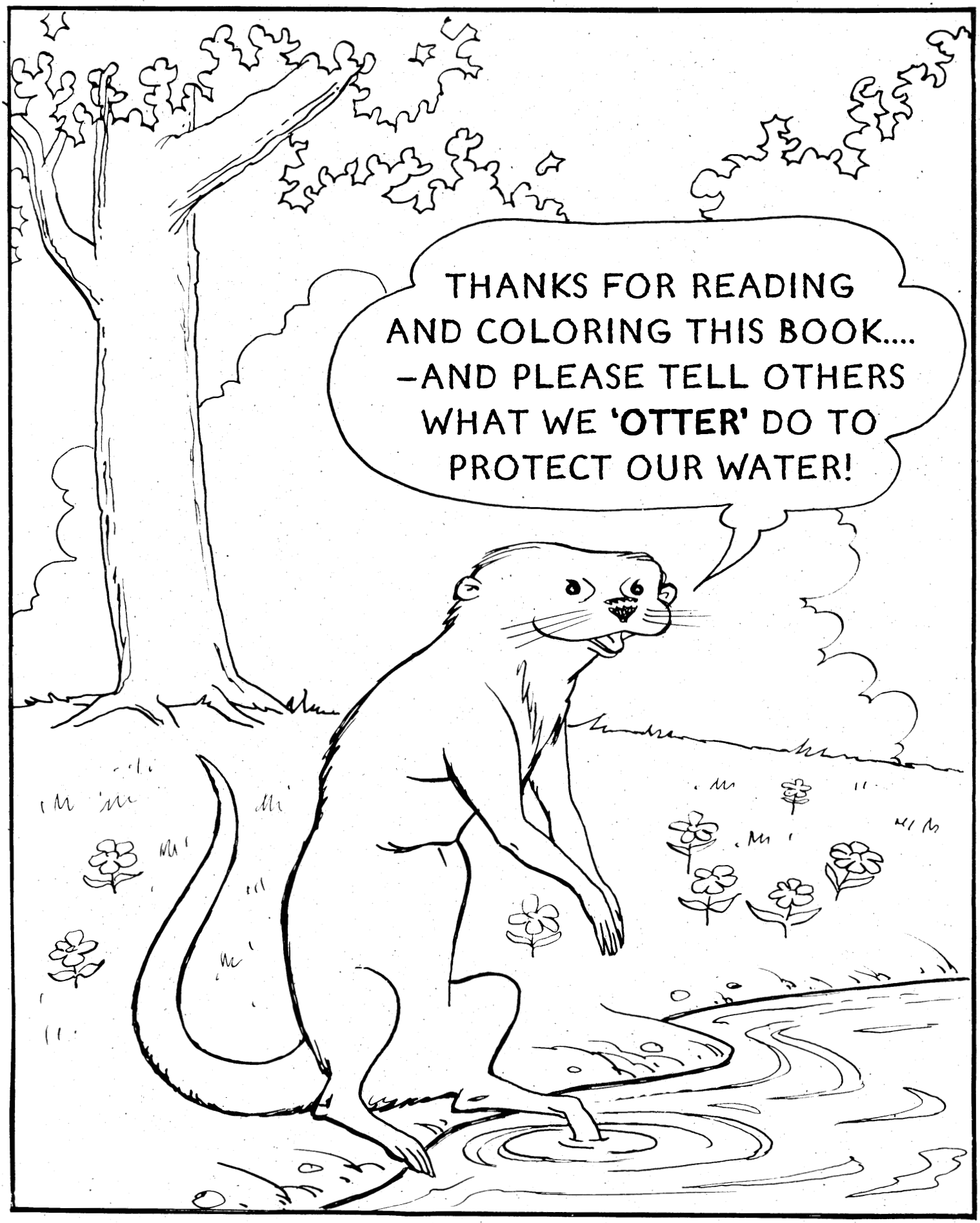


Some Water Facts:

1. About 80% of the earth's surface is water. However, 97% of the earth's water is salt water found in the seas and oceans and not fit for drinking. Another 2% of the earth's water is frozen at the North and South poles. Consequently, only 1% of all the water on earth is drinkable.
2. Human bodies are 66% water.
3. Elephants are 70% water.
4. An ear of corn is 80% water.
5. A tomato is 95% water.
6. An average home needs nearly 300 gallons of water each day for such things as drinking, taking showers, washing dishes and clothes, and brushing teeth.

Clearly, water is precious. We must protect it and not waste it.


What can you do around your home to save water?
Check for dripping faucets. If you find a dripping faucet:
1. Put a bucket under the drip for one hour.
2. After one hour, measure the water with a kitchen measuring cup. Record the amount of water: _____.
3. Repeat the experiment. This time wait 24 hours, measure the amount of water that drips into the bucket and record the amount: _____.
4. Have an older person help you figure out how much water is wasted in a month: _____.
5. Ask the older helper to show you how to keep the faucet from dripping.
Can you save more water by taking a bath or shower? Here is how you can find out:
1. Take a bath. Fill your tub with water. Before you step in, use a yardstick to measure the depth of the water: _____.
2. The next time you need to get clean, take a shower. Close the bathtub drain so the shower water will collect in the tub. When you are finished, step out of the tub and measure the depth of the water: _____.
3. Which uses less water, a bath or a shower?


THANKS FOR READING AND COLORING THIS BOOK....
–AND PLEASE TELL OTHERS WHAT WE 'OTTER' DO TO PROTECT OUR WATER!

we really ‘otter’

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