

DIY

LAKE SCIENCE

WATER UNDERGROUND

BESIDES LAKES AND RIVERS, WHERE CAN WE FIND FRESHWATER NEARBY?



ACTIVITY DESCRIPTION

Many people get water from a source deep underground, called groundwater. In this activity you'll make a model to explore this hidden water, and see how it connects to the other bodies of water.

Age: 7 and up

Preparation: 10 minutes

Activity: 20 minutes

Cleanup: 10 minutes

ACTIVITY MATERIALS

- Clear plastic bin (at least as large as a shoebox)
- Small white gravel, enough to fill about half of the plastic container
- Colander or strainer
- 1 L (34 oz) of water in a container
- 250 mL (about 8 oz) of water in a separate container
- Blue and red food coloring
- Soap dispenser pump, rinsed (pump only, not container)
- Tape (most kinds will work)
- Old pair of pantyhose or other thin stockings, or thin piece of cotton
- Scissors
- Rubber band
- 2 small, clear drinking cups



MATERIALS NOTE

You can purchase gravel in garden nurseries and aquarium supply stores. White gravel works best, but other light colors work too. Make sure the soap dispenser pump is rinsed out so there's no soap in it.

STEP 1

Add gravel to the clear bin so the bin is a little less than half full. Empty all that gravel into the colander and rinse it well to remove any dirt. Return the cleaned gravel to the bin. It's okay if the gravel is still wet.



STEP 2

Add several drops of blue food coloring to the larger (1 L) container of water and mix carefully. This blue water represents clean, unpolluted water. If you use a larger plastic bin, you may need to use more than 1 L of water.



STEP 3

Slowly add some blue water to the bin, until the water reaches halfway up the gravel. You can see the water level by looking through the side of the bin. Leave some blue water in the original container—don't pour it all on your gravel landscape. This water, which is under the surface of your model landscape, represents groundwater. The bin, gravel and water together make a model of a watershed. A watershed is the land around a body of water, or the area which collects water that drains to a river, lake or ocean.



STEP 4

Make a hill on one side of your watershed by piling the gravel higher in one half of the bin. Make sure to leave a thin, flat layer of gravel covering the bottom of the other half. You should be able to see water on the lower, flat side of the watershed. You've made a lake! Look through the side of the bin again. What do you notice about the water level?



STEP 5

Cut a square approximately 4 cm X 4 cm out of the panty hose or piece of cloth. Wrap the square around the bottom end of the dispenser pump and keep the square in place with the rubber band.



STEP 6

Place the fabric-covered end of the pump just inside the edge of the bin on the hilly side. Push it down through the gravel until it hits the bottom of the bin. Use tape to secure the pump to the bin, so the pump stands up straight in the gravel.

You now have a “well” that can be used to pump groundwater up to the surface! The piece of fabric acts like a screen that filters sand and dirt from entering the well.



STEP 7

Hold one of the small, clear drinking cups under the pump and push the pump down at least 10 times. Blue water should start flowing from the dispenser into the cup. Set this cup aside, as you will need it later in this activity.



STEP 8

Add several drops of red food coloring to the smaller (250 mL) container of clear water and mix. This red water represents pollution, such as motor oil or fertilizers.



STEP 9

“Spill” about half of the red polluted water into your lake (but not on the gravel hill you made). Look again through the side of your bin. Can you see the polluted water? Where is it in the watershed?



STEP 10

Hold another empty, small clear drinking cup under the pump, and press the pump about 10 times again. How does the color of the water flowing now compare to the first, blue sample of clean groundwater (that you pumped before the spill)? Did the color of the pumped water change? What do you think happened?



WHAT'S GOING ON?

When rainwater hits the ground, some of it—called surface water—flows into rivers and lakes. Some of it keeps moving slowly downward through the spaces and cracks between rocks and soil underground. This process is called infiltration. The water that fills the empty spaces and cracks is called groundwater. The top of this groundwater layer (which you saw through the side of the bin) is called the water table. When you “spilled” pollution into your lake, it started traveling through the underground rocks and the groundwater. The pollution traveled all the way across your watershed to the well, and was pumped up into the cup.



Water on the surface can slowly move downward underground. This is called groundwater.

GROUND-WATER IS IMPORTANT

Where does the water you drink come from? There's a good chance you're drinking groundwater. More than half of people in the U.S. use groundwater for drinking. Most farms in the country use groundwater to water crops—our food is grown with groundwater! Groundwater and surface water are connected. Polluting one can pollute the other. You could see this when the polluted water you “spilled” into your lake traveled to the groundwater and up into your well. To help keep groundwater healthy, don't dump pollution into surface water (like used motor oil into a drain). Instead, contact your local officials to



find out where you can safely dispose of chemicals.

LEARN MORE

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LawrenceHallofScience.org/do_science_now/diy_lake_science

CREDITS

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This activity from the DIY Lake Science app allows families to investigate and learn about lakes and bodies of water at home or on the go! The app features twelve hands-on investigations, as well as videos and a lake simulation.

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