



A MYSTERY DOWN UNDER!

Objectives:

The student will be able to:

- ◆ Define appropriate groundwater terms;
- ◆ Explain where groundwater is found;
- ◆ Identify sources of groundwater pollution and possible solutions

Suggested Grade Level:

6-8

Subjects:

Science, Language Arts

Time:

90 minutes

Materials:

- student sheet
- clear plastic sweater box or similar container
- poster board
- string or fishing line
- colored markers
- clay
- soil
- sand
- gravel
- plastic sandwich bag
- grass
- plastic tree figures
- water
- teacher sheet
- poster board and art supplies (optional)

BACKGROUND INFORMATION

Every day, people all over the world depend on a hidden resource-groundwater. Only 3% of the Earth's water supply is fresh water and almost 2% of that is groundwater. In fact, more than 50% of the people in the United States get their drinking water from groundwater, including almost all who live in rural areas.

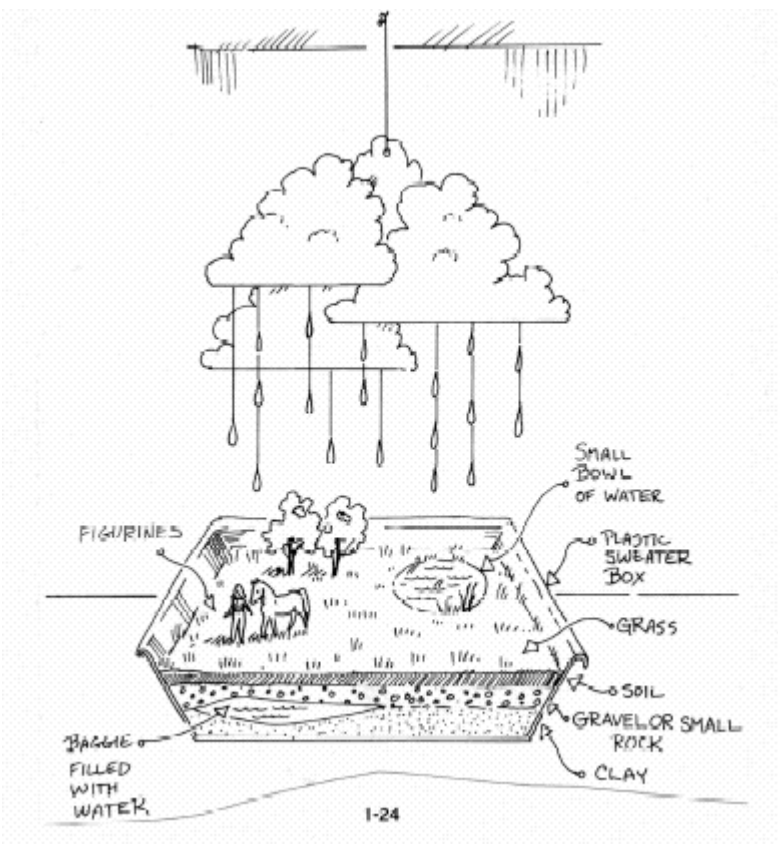
There is really nothing mysterious about groundwater. We just can't see it like we can see a pond, a stream, or the ocean. This water collects below the earth's surface in aquifers, spaces between soil and rock particles. It is also found in cracks and crevices and inside porous rocks.

The top surface of groundwater is called the water table. When the water table is high enough, groundwater comes to the surface naturally in springs, lakes, ponds and rivers, and it can also be brought to the surface by drilling wells. But the top level of the groundwater (the water table) is usually underground. Groundwater is a vital part of the water cycle and is replenished by rainfall. The amounts of groundwater in different areas of the world vary, and the amount of any one place can change due to prolonged drought, heavy withdrawal for human use or other factors.

Groundwater quality is generally better than that of surface water because it is not as readily exposed to pollution sources. Also, the movement of groundwater through various layers of soil and rock filters out many impurities. However, some groundwater can be polluted by pesticides, chemicals, landfill leachate, and other materials that seep into groundwater supplies.

ADVANCED PREPARATION

- Construct model of water cycle. Use poster board to make clouds and raindrops. Hang clouds with raindrops below them (use string or fishing line). In a clear container, such as a plastic sweater box, create "the ground" area. From the bottom up, layer the following: clay, gravel or small rock, a plastic sandwich bag filled with water, layer of soil, small plastic bowl filled with water (sink the bowl into the soil so the top will be at surface level to simulate a pond or lake), grass, trees, and other figures.
- Photocopy the student sheets, "The Water Cycle," and "Groundwater: Fact or Opinion?"



PROCEDURE

- I. Setting the stage
 - A. Pour a small amount of water into the water cycle model. Ask students where the water went. Explain since it soaked into the ground and will seep into underlying rock formations, it is called groundwater.
 - B. Explain that the top surface of the groundwater is called the water table.
 - C. Ask students which they think would be most easily polluted: surface water (lakes, ponds, etc.) or groundwater. Ask them to give reasons for their answers.
 - D. Point out the importance of groundwater as a part of the water cycle.
- II. Activities
 - A. Discuss the steps in the water cycle. Refer to the model.

1. Distribute the student sheet “The Water Cycle.” You may want to have the students do this in small groups or you may do this together, as a class.
2. Students number the steps in the water cycle in the correct sequence, beginning and ending with evaporation (Answer: 4, 3, 6, 5, 2, 1)
3. After students complete the activity, list the steps on the board as they call them out.

III. Follow-Up

- A. Have students complete the student worksheet called “Groundwater: Fact or Opinion?” (Answers: 1.0, 2.F, 3.0, 4.0, 5.F, 6.F, 7.0, 8.F, 9.0, 10.0)
- B. Review with students the many sources of groundwater pollution. Summarize that anything that pollutes water can pollute groundwater, especially things stored on or under the ground or applied to it. Ask them to make a list of what they and their families can do to help keep groundwater clean.

IV. Extensions

- A. After reviewing correct letter form, have students write to the American Ground Trust (and other sources) for additional information.
- B. Have students make posters to display around the school using the information from III.B.

RESOURCES

“America’s Priceless Groundwater Resource,” American Groundwater Trust, Dublin, Ohio, 1991.

“Groundwater Pollution Control,” American Groundwater Trust, Dublin, Ohio, 1991.

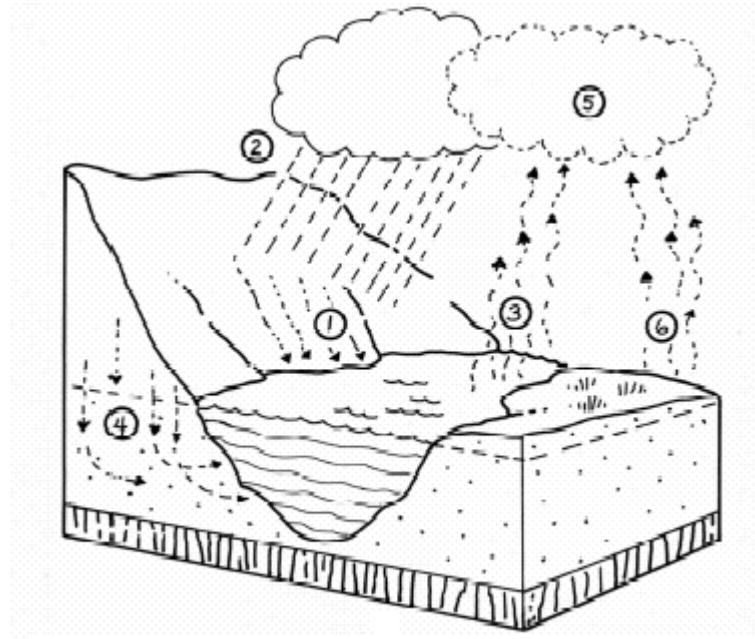
Thank you to the Environmental Protection Agency *Water Sourcebook* for this activity!

http://water.epa.gov/learn/kids/drinkingwater/wsb_index.cfm

THE WATER CYCLE

Number the steps in the water cycle in the correct sequence, beginning and ending with evaporation.

- _____ Replenishes (recharges) water in rivers, lakes, streams and ponds.
- _____ Falls to the Earth in some form of precipitation (rain, snow)
- _____ Surface water evaporates again
- _____ Seeps into the ground and enters an aquifer
- _____ Condenses in the atmosphere
- _____ Evaporates from surface water, plants, and animals as water vapor





GROUNDWATER: FACT AND OPINION?

If the statement is a fact, put an F on the line. If it is an opinion, put an O.

- _____ 1. Groundwater is a mysterious source of water.
- _____ 2. Groundwater is found beneath the earth's surface.
- _____ 3. Groundwater tastes better than surface water.
- _____ 4. Groundwater is the most important of all natural resources.
- _____ 5. Groundwater is not as easily polluted as surface water.
- _____ 6. Groundwater is a part of the water cycle.
- _____ 7. Studying about groundwater is boring.
- _____ 8. One person's actions can affect groundwater.
- _____ 9. Landfills are yucky.
- _____ 10. Farmers should not use pesticides.