Ground-Water Movement

Introduction
Ground water must be able to move through underground materials at rates fast enough to supply useful amounts of water to springs or wells. In geologic terms, rock materials can be classified as an aquifer. The ability of these rock materials to transmit water is called permeability. Materials that allow water to move through them are called permeable. Materials that do not allow water to move through them are called nonpermeable. Both permeable and nonpermeable rocks are found in the Earth's crust. Rocks that are permeable to water can be called aquifers.

Objectives
1. Describe several sources of rock materials that make up an aquifer.
2. Discuss the connection between surface water and ground water.
3. Describe the movement of water through sand, gravel, and clay.

Activity: Recharge - Discharge

1. Identify several sources of rock materials that make up an aquifer.
2. Describe how water moves through sand, gravel, and clay.

Materials
1. At least 10 students.
2. Larger water table (a reservoir or mountain pond).

Preparation
This activity can be conducted in the classroom, gymnasium, or outside the school building. It can be conducted indoors by using a large hill or a sand pit. This is a two-part activity.

Activity
Part 1: Recharge
1. Fill large water table (a reservoir or mountain pond) with water.
2. Use funnel (a pitcher or funnel) to add water to the water table.
3. Use sand, gravel, or rocks to simulate the soil over the aquifer.
4. Use a spade to stir the water table and form a small hill.
5. Use a pump to pump water from the water table.
6. Examine the soil over the water table to observe the movement of water through the sand, gravel, or rocks.

Part 2: Discharge
1. Fill large water table (a reservoir or mountain pond) with water.
2. Use funnel (a pitcher or funnel) to add water to the water table.
3. Use sand, gravel, or rocks to simulate the soil over the aquifer.
4. Use a spade to stir the water table and form a small hill.
5. Use a pump to pump water from the water table.
6. Examine the soil over the water table to observe the movement of water through the sand, gravel, or rocks.

Activity
Explains to the students that the ground water is composed of two sides of the landscape. One of the sides has a high water table, and the other side has a low water table. The students can observe the water table by looking at the positions of the hills and valleys. The students can try to pump water out of these areas and observe the movement of water through the sand, gravel, or rocks.

Example
Ground water is composed of two sides of the landscape. One of the sides has a high water table, and the other side has a low water table. The students can observe the water table by looking at the positions of the hills and valleys. The students can try to pump water out of these areas and observe the movement of water through the sand, gravel, or rocks.

Innovative Questions
1. What is the connection between surface water and ground water?
2. How does the movement of water through the sand, gravel, or rocks affect the water table?
3. How does the movement of water through the sand, gravel, or rocks affect the discharge of water from the water table?

Poster Series
This poster is part of a series of educational posters designed to provide information about the U.S. Geological Survey's Water Resources Education Initiative. The Posters are available in English and Spanish. The following individuals contributed to the design of this poster:

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