

Illustrating the Water Table

Objectives

Students will:

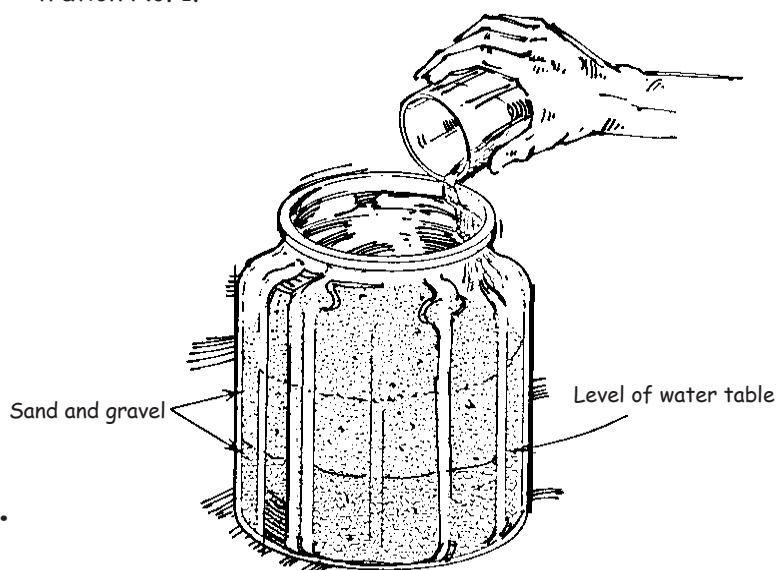
- Become familiar with the meaning of the term "water table."
- Recognize that the water table is one of the contributing factors in the existence of streams, swamps, and lakes.

Background

Students need to understand groundwater and surface water are often connected through the hydrologic cycle. A simple working model can be made in the classroom. "Groundwater" is water that has sunk into the ground and is held under the surface. Rain seeps through the top layers easily. The earth near the surface is loaded with tiny air spaces. Even the rocks have cracks and pores through which water can find its way. But when it reaches clay or impervious rock, it will not sink any farther. As more water sinks into the ground, it begins to collect above the bedrock or dense soil. When the ground has as much water as it can hold, it is said to be saturated. The ground becomes saturated from the rock or dense soil up, and the top level of this water rises towards the surface. This uppermost level is called the "water table". The area of dry ground above the water table is called the "zone" or aeration. After heavy rains, the table is nearer the surface, and in dry weather it drops again.

Procedure

- Fill a wide-mouth jar or a clear glass baking dish with sand (or you may use an aquarium). Spread the sand unevenly in the dish so the surface resembles ponds, swampland, and streams. Carefully add water so the sand is saturated at least 1/3 of the way from the bottom. See illustration No. 1.



No. 1 Simulating a water table
Illustration courtesy of Tennessee Valley Authority

Materials

- Wide-mouth glass jar or a clear glass baking dish
- A glass
- Chalkboard and chalk
- Crayons
- A mixture of sand and gravel
- Water

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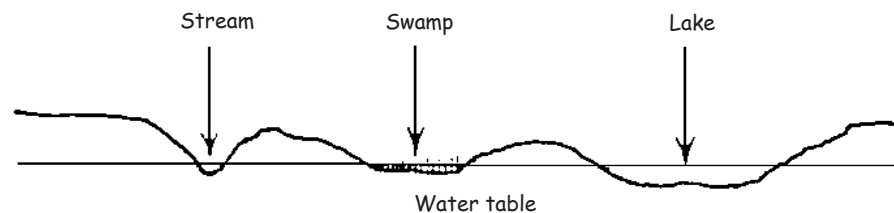
Illustrating the Water Table

Procedure con't

- The bottom of the container represents the bedrock layer that usually lies deep under Earth's surface. The saturated area of sand represents the groundwater supply. The highest level of that groundwater is known as the "water table." Use a marking instrument of some kind to mark the present level. Show the students that if you add more water, the water table will rise.
- Add more water and have the students observe what happens to the depressions made in the sand. This represents what happens when a depression in Earth's surface joins with underground water supplies. Some of the water seeps out of the soil layer into the recession, creating a swamp, lake, or stream.

This model can be observed over a period of time to see how the surface water drops as the water table drops by evaporation.

- On the chalkboard show that wherever the land surface dips below the water table, groundwater flows out to the surface. See illustration No. 2. This forms springs, swamps, or lakes. Also tell the class that during dry weather periods the water table level goes down and some streams and swamps may dry up.
- Aid discussion about the experiment by asking students to explain how different points in the experiment relate to the actual conditions in the environment.



No. 2. Natural water table
Illustration courtesy of Tennessee Valley Authority

Follow-Through

The class may be able to visit a swampy area in the early spring when the water table is very close to the land surface. Sometimes it is possible to reach the water table by digging a small hole with a shovel.

Adapted with permission from *Groundwater: A Vital Resource*, Cedar Creek Learning Center in cooperation with Tennessee Valley Authority, Doug Ratledge, Director.

