

A Groundwater Drink



Removal of groundwater in some areas, like Houston, has caused the earth to subside (sink) enough to cause cracks in buildings and roadways.

Materials/Equipment

Crushed ice (rocks and soil)
approximately 3 ounces of cola (groundwater)
clear plastic straw (pump)
clear plastic cup or glass

Procedures

1. Fill the cup or glass with crushed ice, noting that this simulates the rocks and soil.
2. Ask participants to observe carefully as you slowly pour the cola into the ice-filled glass or cup.
3. Ask the participants to describe what happens.

The cola drips or runs down through the ice until most of it ends up in the bottom of the glass or cup. Note that the ice in the bottom of the cup is flooded by cola (saturated zone). All the spaces among the ice chunks are filled with cola. Higher in the glass, some cola may cling to the ice or the sides of the glass, but the spaces among the ice chunks are filled with air (unsaturated zone). The water table is the top of the saturated zone.

4. Put a clear straw into the glass and observe what happens.

The cola fills the straw to a point even with or slightly above the water table

5. Sip enough cola through the straw to lower the level of the cola slightly. Ask the participants to describe what happens.

The level of the cola drops as it flows through the spaces in the ice so its surface remains relatively level, but lower, in the glass.

6. Pause and allow the cola to fall to a relatively level “water table” before taking another sip.

The level of the cola in the straw falls to the level of the water table. Note that wells work the same way on a larger scale. As water is withdrawn from the saturated zone at the well head, water flows through the saturated zone keeping the water table relatively level. If adequate recharge is taking place, the water table may remain fairly constant. If water is being removed faster than it can be replenished, the water table will drop. In that case, water is being “mined” from the aquifer.

Extension: To show subsidence of the ground level, float a bit of ice cream or whipped topping on the ice to simulate soil. Allow room for the ice to settle after some cola has been removed from the glass. As “water” is removed, the “soil” surface will settle lower in the glass.