Make an Aquifer in a cup

with pollution effects

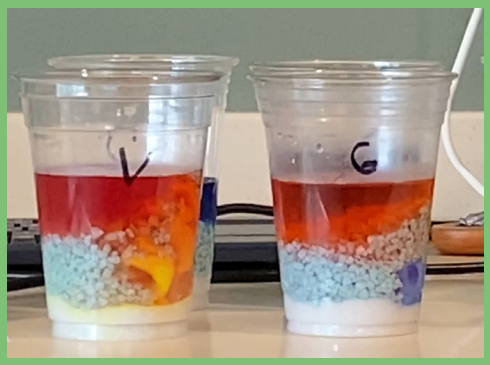
The experience:

This is a fun way to see a cross section of an aquifer and how proper disposal of contaminants is very n ecessary to prevent infiltration into the water system. An aquifer is a body of pourous rock which can contain or transmit groundwater

This activity demonstrates the detriments of pollution and how drinking water can be affected.

Materials:

- One clear, plastic cup, 2 3/4" deep X 3 1/4" wide for each participant
- One piece of molding clay that will allow a 2" flat pancake to be formed
- White play sand that will measure 1/4" in the bottom of each cup
- Aquarium gravel (natural color) or small pebbles - rinse to avoid powder clouding water
- Red food coloring
- 1 bucket of water and small cup to dip water from bucket



Directions:

1. Pour 1/4" of white sand in the bottom of the cup completely covering the bottom. Pour water into the sand until sand is wet, but no standing water on top of sand. You should see how water absorbs the sand but remains around the sand particles as it is stored in the ground, ultimately forming part of the aquifer.

2. Flatten the modeling clay like a pancake. Cover 1/2 the sand with the clay and press the clay to one side of the cup to seal off that side. The modeling clay represents a geological material, such as clay, granite, slate or marble, through which significant quantities of water can not move. Simply put, it keeps water from passing through it. Pour a small amount of water on the top of the clay to show how the water remains on top of the clay, only flowing into the sand from the areas not covered by the clay.

3. Use the aquarium rocks/pebbles for the next layer of "earth". Place the rocks over the sand and clay, covering the entire cup. On one side of the cup, slope the rocks to form a hill and a valley (see illustration above). These layers represent layers of the earth's surface. Pour water info the "aquifer" until the water in the valley is even with the hill. Water stored around the rocks should be visible. Rocks are porous which allows water to be stored within those pores and the openings between the rocks. A"lake" will form, if instructions are followed. This shows that ground and water supplies can be utilized for drinking water purposes.

4. Put a few drops of food coloring on top of the rock hill, close to the inside wall. Often old wells are used to dispose of farm chemicals, trash and motor oils and other activities above the aquifer can seep into drinking water. By using the food coloring, we can see the color spread through the rocks as well as the surface water and the white sand at the bottom. This is evidence that contaminants/pollution can spread throughout an aquifer over time.

Adapted from https://www.alcosan.org/docs/default-source/kidscorner/lava-lamp.pdf and U.S.EPA, Office of Water; www.epa.gov/safewater