

Amazing Aquifers

Description:

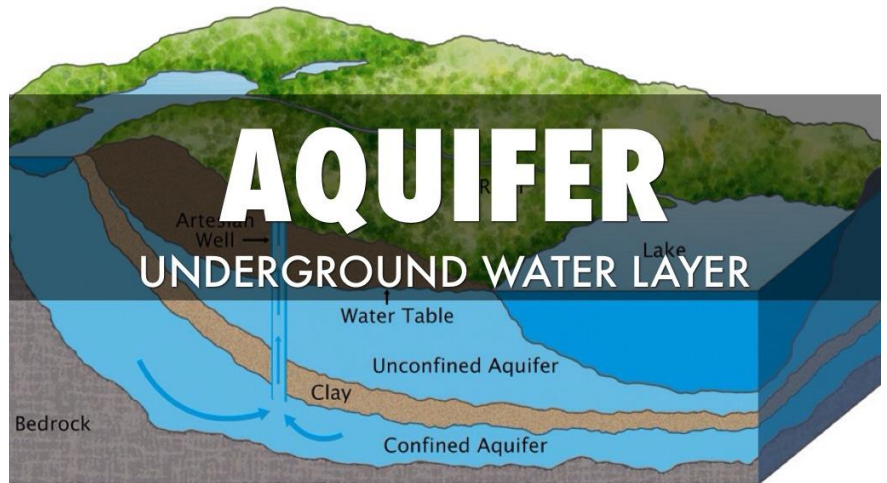
Students will construct aquifer models to learn about how water is stored underground and can be removed and used. Students will identify aquifers' main components and why aquifers are important and need to be protected.

Essential Questions:

1. What are aquifers and why are they important to our communities?
2. What happens when you remove water from an aquifer?

General Supplies:

- Clear plastic cups
- Grey or white clay (bedrock)
- Green, blue, and brown clay (land, water, and trees)
- Small gravel
- Sand
- Shells
- Tape
- Straws (cut into thirds)
- Scissors



Procedure/Instructional Strategies:

1. Introduce students to aquifers
 - a. Over 30% of Earth's freshwater is located underground!
 - b. This water is contained in **aquifers**. **Aquifers** are bodies of permeable rock (sand, gravel, silt) that can contain or transmit groundwater.
 - c. Aquifers are separated by **confining layers** made of clay or non-porous rock (bedrock).
2. Provide each student with one clear plastic cup and a small chunk of grey or white clay (enough to cover the bottom of the cup). Instruct them to flatten the clay and press it into the bottom of their cups. They've now created their **bedrock** layer.
3. Provide each student with a small handful of gravel. Instruct them to place the gravel on top of their bedrock layer while angling it to form a hill. They've now created their **aquifer body**- the portion of the aquifer that will store and transmit groundwater.
4. Provide each student with a small chunk of grey or white clay. Instruct them to flatten it and place it on the high section of the hill of their aquifer body. This will form the top **clay confining layer**.
 - a. Optional- roll the clay in sand prior to flattening it into confining layers. Since we live in a coastal region, the clay confining layers in our aquifer systems contain sand and shells.

5. Provide students with green clay, brown clay, rocks and shells to decorate the tops of their aquifer systems. This will represent land.
6. Pour enough water into each student's cup to cover the top of the exposed aquifer body. This represents **groundwater**. Provide each student with a straw portion. Instruct them to "drill" through their land to reach the groundwater in their aquifer body. This represents a **groundwater well**.
 - a. Wells can be drilled into the aquifers and water can be pumped out. Precipitation eventually adds water (recharge) into the porous rock of the aquifer. For deep aquifers, this may take many years!
 - b. If you remove water from an aquifer faster than it can recharge, you can:
 - i. Lower the water table
 - ii. Create **cones of depression**
 - iii. The well can "go dry"

