

# EDIBLE AQUIFER

**Objective:** Students will illustrate the geologic formation of an aquifer, how pollution can get into groundwater, and how this pollution can end up in drinking water wells. Students will come to understand how our actions can affect groundwater and drinking water.

**Illinois State Goals: 11.B.**

## Top Book Hits:

Water Dance by Thomas Locker;

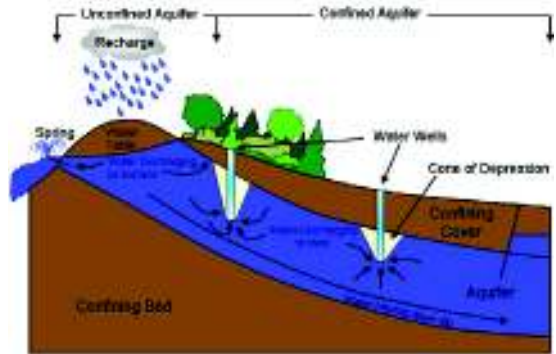
**ISBN-13:** 978-0152163969

A Drop Around the World by Barbara McKinney;

**ISBN-13:** 978-1883220723

## Materials Needed:

- Chocolate chips (4, 12 oz bags)
- Chocolate sprinkles (2, 3 oz containers)
- Clear plastic cups (12 or 16 oz) (25 - 30)
- Clear soda (e.g., lemon-lime) (4 liters)
- Crushed ice (the smaller the better)
- Gummy bears or worms (small) (2 lbs)
- Red Kool-Aid® (dry) (4 small packages)
- Spoons (25 - 30)
- Straws (clear work best) (25 - 30)
- Vanilla ice cream (½ gallon or 25 - 30 single serving cups)



## Procedure:

1. Fill a clear plastic cup 1/3 full (total) with a combination of gummy bears, chocolate chips, and/or crushed ice. *These represent gravels and soils that make up the aquifer.*
2. Add enough soda to just cover the candy/ice. *The soda represents ground water. Notice that the soda fills all of the spaces among the gummy bears, chocolate chips, and ice. The aquifer is now saturated with soda; it is a "saturated zone." In an unconfined aquifer (see Step 3), the top of the saturated zone is called the "water table."*
3. Add a layer of ice cream. (Optional) *This layer, called a "confining layer" or an "aquitard," is impermeable or significantly less permeable than the aquifer below it (it is difficult for water to soak through). It helps protect the aquifer from contamination and is usually made of rock and/or clay. An aquifer under a confining layer is called a "confined aquifer." An aquifer without a confining layer is called an "unconfined aquifer." If your local aquifer does not (or even if it does), consider omitting the ice cream or having half the class use ice cream and half not to compare the results.*

*Give credit where credit is due...Idaho Department of Environmental Quality.*

4. Add crushed ice on top of the confining layer/water table. *This represents the unsaturated zone, the area where air fills most of the pores (spaces) in the soil and rock.*
5. Scatter chocolate sprinkles over the top. *The sprinkles represent the soil, which is very porous.*
6. **The aquifer is now complete. Your aquifers will probably be messy and not look like the picture on this page. That's OK! Real aquifers aren't neatly layered either.**
7. Sprinkle Kool-Aid® over the top. *The Kool-Aid® represents contaminants on the ground (e.g., fertilizers, oils, fuels, ). Does anything happen to the Kool-Aid® right away? (Usually nothing will happen.)*
8. Using a drinking straw, "drill" a "well" into the center of the aquifer. *Observe the aquifer and Kool-Aid®. What, if anything, happens when the well is drilled?*
9. Begin to "pump" the well by slowly sucking on the straw. *Watch the decline in the level of the soda and observe what happens to the contaminants. Do contaminants (Kool-Aid®) leak through the confining area (ice cream) and get sucked into the well? If so, do more contaminants get into wells in confined or unconfined aquifers? (If your class made both; see Step 3)*
10. Pour a small amount of soda over the top. *The soda represents precipitation. It recharges the aquifer (adds new water). Watch how the Kool-Aid® dissolves and moves into the aquifer. The same thing happens when contaminants are spilled on the ground. Do you think you could get the Kool-Aid® back out of the soda?*

***More Hits:*** Aquifer Virtual Field trip [www.spokaneaquifer.org/kids/vfte/](http://www.spokaneaquifer.org/kids/vfte/)  
Illinois Water Ag Mag [www.agintheclassroom.org](http://www.agintheclassroom.org) or through local agricultural literacy coordinator.