

Goopy Garbage

Setting: Indoors or outdoors

Time: 15-20 minutes

Adapted by Jill Becker from the Groundwater Foundation's "Making a Bigger Splash" activity guide

Introductory questions:

Where do you think your drinking water comes from?

What are some other places where people might get their drinking water?
(Reservoirs/lakes, rivers/streams, aquifers/groundwater)

What is groundwater? How might pollutants get into groundwater?

Do you think it is important for you to worry about protecting groundwater when you get your water from -----?

Background:

The history of garbage and landfills goes back to the beginning of time. Prehistoric cliff dwellers used to dump their waste in the back rooms of their cliff homes. Think about ancient Greece. What do you think the people did with their waste? Around 500 B.C. the first known regulations against throwing waste in the streets were issued in Greece.

Ancient landfills were often places of continuous burning fires. After that, people began covering their waste with soil because of the unpleasant odor and the attraction of rodents and flies. In 1916, "sanitary landfills" were developed by placing soil on top of the waste each day.

Archaeologists explore the waste of prehistoric people to better understand their society, culture, and the way they lived. What do you think archaeologists will learn about us thousands of years from now?

Modern Landfills:

How do you think landfills contribute to groundwater contamination? (Water dissolves some of the contents and carries contaminants into the groundwater.)

This mixture of contaminants is called leachate and as the amount of waste increases, the potential for leachate to enter the groundwater increases. In various parts of the world, including the U.S., regulations have been established to protect groundwater. Barriers such as plastic or clay layers must be installed in new landfills today. Double liners are presently installed in new landfills. Permits are required to open and close landfills. Research is continuing to determine even more efficient ways of preventing pollution to groundwater.

ACTIVITY PAGES

Our Activity:

Have prepared ahead of time: Cut several gallon milk jugs (one per 4-5 students) in half (3-4 inches from bottom) and invert the top half with lid still on (like a funnel) into the bottom half to make your landfill. Line the top half of the jug with plastic wrap. The milk jug represents the landfill and the groundwater below. The plastic wrap represents the landfill liner.

What types of waste are dumped in landfills? (Have pre-measured amounts of each of these at each station and dump them into the landfill as the students name them)

paint = food coloring
oil products = vegetable oil
cleaners = ketchup
gasoline = syrup
paper products = toilet paper
food waste = cereal
batteries = Alka-Seltzer tablets

Have cups filled with potting soil to cover the landfill in the end.

What are some better ways of disposing of these materials? (Recycling center, reducing amount used, or reusing. Many communities have household hazardous waste disposal programs)

Cover the landfill with dirt. "Bulldoze" the landfill with a plastic spoon. Be careful not to touch the bottom of the landfill so the liner doesn't break!

How does the landfill smell?

Let it rain by sprinkling water onto the landfill. Discuss precipitation, percolation, & leachate.

What will happen when the lid is taken off the landfill? (Nothing unless a hole was made in the liner.) Remove lid. Why did nothing happen? (The liner) What happens to rainwater if the clay or plastic liner doesn't leak? It collects in the garbage and on top of the liner. Leachate collection systems help reduce the amount of leachate sitting on top of a liner. What happens if the liner or clay does leak? (Pollutants go into the groundwater.) Poke a hole in the liner using a sharp pencil to demonstrate a liner leak.

Would you like to drink this water?
How do you think this water could be cleaned? Is it easier to prevent water pollution, or clean it out of the water later?



Children learn proper hazardous waste disposal methods at the April Shower to Water Towers Festival.