

# Water Limbo: How Low Can We Go?

## Equipment needed:

- ✦ Four, clear 2-liter bottles with the tops cut off and a loose cover over them (see preparation page for more instructions on how to prepare these bottles).
- ✦ 1 pole and 1 pole stand (optional)
- ✦ Items to represent the pollutants
- ✦ Signs with pollutants written on them beforehand that have ties to go over the students' necks

Ask the students: **“What is a watershed?”**

A watershed is the area of land surrounding a waterway that drains into it. For example, the watershed of a lake would include not only the streams entering into that lake but also the land area that drains into those streams and eventually the lake.

Ask the students: **“What are some examples of pollution that can get into our lakes and streams?”**

### 🌍 Soil/sediment

🌍 Nutrients (fertilizer, phosphorus, algae, plants, grass) – though plants need nutrients, the excess can wash into the water after a rainstorm and cause an algae bloom giving the stream or lake a pea soup color. This algae robs the water of oxygen and kills aquatic life.

🌍 Bacteria (human and animal waste) can cause diseases such as typhoid, cholera and dysentery.

🌍 Toxins/poisons (pesticides, motor oil)

The small film containers contain the pollutants →

### 🌍 Trash/garbage



As students give these examples, have them come up and put name placard around their necks with those examples listed one them. Have the pole placed on the top rung or have two students hold it at a pre-arranged height then have the other students “limbo” under the first rung. For the ones who make it, they put an amount of pollutant corresponding to what they are in the lake or reservoir (the cut, 2-liter bottle) at the end of the stream.



Ask the students: **“How can we stop these pollutants from getting into the water in the first place?”**

The following are some examples of answers they might give or that you might try to draw out of them. After they give an example of how to stop polluting the stream, the pole is lowered to the next level and the “pollutants” try to go through again.



- ④ Soil/sediment – Plant grass and plants to keep soil in place. Don't allow cow grazing along stream banks since that brings sediment into the stream and eventually into the lake. Construction areas need to have silt fences to prevent sediment from running into the streets and down storm drains into the rivers. Reservoirs can fill up with this sediment because of these problems.
- ④ Nutrients – Don't add additional fertilizer to lawns. Instead, buy a mulching lawn mower and leave the grass clippings on the lawn. Never dump grass clippings down a storm drain!
- ④ Bacteria – Scoop the poop! Bury it where it can naturally fertilize the soil or properly dispose of it in a sealed container. Don't leave it where it can wash into a stream.
- ④ Toxins/poisons – Instead of using chemical pesticides, use beneficial insects such as ladybugs and butterflies. Keep cars in good working order and properly dispose of any fluids. Never dump any chemicals down a storm drain since you drink what you dump.
- ④ Trash/garbage – Don't litter and try to cut down on the amount of garbage you are creating. Instead of using utensils that are thrown away, use eating utensils that are washed and reused. **Reduce** the amount of waste you are creating. **Reuse** items until they are worn out. **Recycle** plastics, aluminum, glass, and paper.
- ④ Other things you can do:

- ➔ Never throw anything down storm drains since they are for rainwater only.
- ➔ Tell others how important it is to keep our land and water clean
- ➔ Plant a tree. They take pollutants out of ground water, provide shade, and clean the air.
- ➔ Find out what waterway you live near. Where does your water come from?
- ➔ Recycle. Find out what is recyclable in your community.
- ➔ Buy products in recycled or recyclable containers.
- ➔ Learn about environmental issues. Get involved in local organizations.
- ➔ Conserve water whenever possible. For example, turn off the water while brushing your teeth and don't linger in the shower.

Those who make it through the second time, put their pollutant in a second "lake". The students are asked to name another way to reduce pollution and the pole is lowered to a third level, etc.



← This pollutant makes it through the 2<sup>nd</sup> time.

This pollutant doesn't make it into the watershed! →



After two to four rounds, take off the covers and show them the "lakes" of water and ask them which water they would prefer to drink. Explain that that without unless people do things to protect us, these pollutants would go straight into our drinking water. Government treats surface water and sets limits on different pollutants to protect drinking water but the most effective way is to protect the water at its source.



## **Glossary**

**Erosion** – movement of soil commonly caused by running water or wind

**Fertilizer** – nutrient source for plants

**Pesticide** – chemical used to kill a pest such as an insect, weed or rodent

**Polluted runoff** – rain water or snow melt that carries pollutants

**Recycle** – reuse of materials such as plastic, glass or metal in either its original or different form rather than putting them in the garbage

**Storm sewers** – underground pipe system that carries stormwater from streets and parking lots to local waterways

**Water Cycle** – natural process of recycling water from the land to the air and back again. This is also called the hydrologic cycle.

**Watershed** – the land area from which precipitation flows into a waterway.

## Preparing the materials

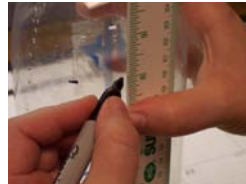
### Making the “lakes” or “reservoirs”

- Recycle clear, 2-liter soda bottles



- Rinse them out and cut off the label

- Make a mark all around the top at the 8” from the bottom

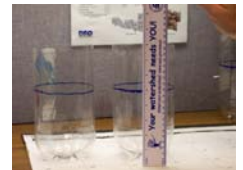


- Cut the top off from the bottom. The top can be used as a funnel. The bottom will now be the lake.



- Wash the lakes and funnels.

- Make a mark 5” from the bottom. This mark will enable you to have the same amount of water in each “lake”



- Put paper in the back of each lake as a backdrop so it is easier to see color differences between the different lakes at the end.



- Make a loose cover to go over all the “lakes” so that students don’t see the color of the lakes until the end of the activity. Copy paper wrappers are good for this. After folding it around the soda bottle, staple it when it is the right size to easily slip over the bottle.



## Making the “pollutants”

It is important to try to use food products in place of the real pollutants so they can safely be disposed of within the wastewater treatment system. Below are a few examples of foods that can “play the role” as that product.

- Motor Oil – prune juice, black cherry kool-aid, grape juice
- Pesticides – mixture of seasonings (ex: For a light colored pesticide use taco seasoning, gravy seasoning, Italian seasoning, any dry seasoning that is light brown or white. For a dark brown or black pesticide, mix unused coffee grounds or tea flakes from the tea bags. Mix them all together and you can be creative with the color you prefer.
- Trash – oatmeal and popcorn
- Animal Waste – cocoa puffs or chocolate pudding
- Soil – cocoa powder is great...it is brown, soft, and easy to pour....looks just like dirt
- Algae – The best is a mixture of peanut butter, syrup, powder sugar, water, and green food coloring since it has the color and texture. As a back-up, you could use green kool-aid or Gatorade.
- Grass – dry seasonings that are green such as basil, thyme, oregano, etc.
- Plants – crumple up bay leaves for the representation of plants. Very realistic