

Who Polluted the River?

Objectives:

- The student will be able to:
- List three ways to prevent and clean up water pollution.

Grade Level:

1–2

Standards:

- English/Language Arts 1
- Geography IV-12; V-14
- Science F
- Social Studies I-d, II-b; III-h, k

Skills:

- Analyzing
- Describing
- Listening
- Understanding cause-and-effect relationships

Duration:

Preparation—30 minutes
(once all materials have been collected)

Activity—20 minutes

Materials:

- A clear gallon jar of water
- A plastic film canister for each student, with label taped to it (canisters are often available for free at film processing stores)
- One cut-out image of character in story from those provided for each student
- Optional—Plastic fish toy
- Large strainer or colander
- Canister ingredients (all are safe for students to handle):

Dry Elements

- Trees: Dry, crumbled leaves
- Building site: 1/2 tsp. dry clay soil (not sand)
- Farmer: 1/4 tsp. baking soda
- Family picnic: Assorted litter (small shreds of paper, pieces of plastic grocery bags, etc.)
- People fishing: Tangle of fishing line (or dental floss)

Wet Elements

- Barnyard: 1/2 tsp. brown liquid, a few crystals of instant coffee mixed with water or food color mix
- Factory: 1/4 tsp. of diluted red food coloring
- Cars/Drivers: 1/4 tsp. of vegetable oil
- Washing the car: 1/2 canister of soapy water
- Motorboat: 1/4 tsp. vegetable oil

Overview:

In this activity, students participate in an interactive story and learn how, as human populations have increased and land uses have changed, many of our rivers have become polluted. This example demonstrates that just as we each contribute to the problem, we can also each be part of the solution.

Procedure:

1. Prepare and label the film canisters as described in the materials section, enough for each student to have at least one canister.
2. Fill a clear, wide-mouthed gallon container with water nearly to the top. Place it near where you will be reading the story. (If using a fish toy, put it in the water now. As one of the questions that appear throughout the story, point to the fish and ask “How do you think the fish feels?”)
3. Distribute one cut-out image to each student.

[NOTE: Every student should get an image and, later, a canister. Unless your class is very small, this will mean you need multiples of many of the canisters. Just don't have more than one barnyard canister (coffee), as two doses of it will make the water too dark to notice the progression of pollution afterwards.]

4. Set up the labeled canisters within easy reach of where you'll be facilitating the activity, lined up in the order in which they are to go into the water.
5. Explain that you will tell a story about the river, (insert the name of a river in your area, if you wish) and that each of the students will play a part in the story. When they hear the name of the item pictured on the cut-out you've given them, they should come up to you and get the matching canister, open it, and empty its contents into the container, which represents the river.

[NOTE: If you feel the students will have trouble opening the canisters without spilling the contents, remove the lids for them, or leave the lids off altogether.]

6. Read the story that follows. Pause after questions within the story to give the students time to think and respond. Refer to the discussion questions below after you have read the entire story.
7. After finishing the activity, use the strainer or colander to take the solids out of the water before you dispose of it.

Discussion questions:

1. Who polluted the river? (**Answer:** everyone played a role)
2. Think about the pollution contained in your canister. What could each of us do to keep the river clean by making sure these kinds of pollution don't get into it in the first place? (**Possible answers:** biking or walking instead of driving, using water carefully, picking up litter so it doesn't end up in our fresh water supply)
3. How could we clean up the water in the jar—after all, everything has to go somewhere? (**Possible answers:** solids can be strained out, or filters like cotton can be helpful in removing the solids)
4. Is it easier to prevent pollution, or to clean it up later?
[Have the students explain their ideas.]

Interactive Story: Who Polluted the River?

There was a time many years ago when our land was very wild. This was a time before roads and cars. Only a small number of people lived here then. These native people depended on nature for many of the things they needed to survive, but they lived simply and didn't change the natural surroundings too much. The people hunted in the forests, found food in the swamps, and caught fish in the river. [*Insert the name of a local river.*]

The beautiful and sparkling river was home to fish and other wildlife.

Question: Imagine that the container of water in front of you was taken from the river a long, long time ago. Describe how it looks to you. Would you drink this water? Eat fish that came from it? Swim in it?

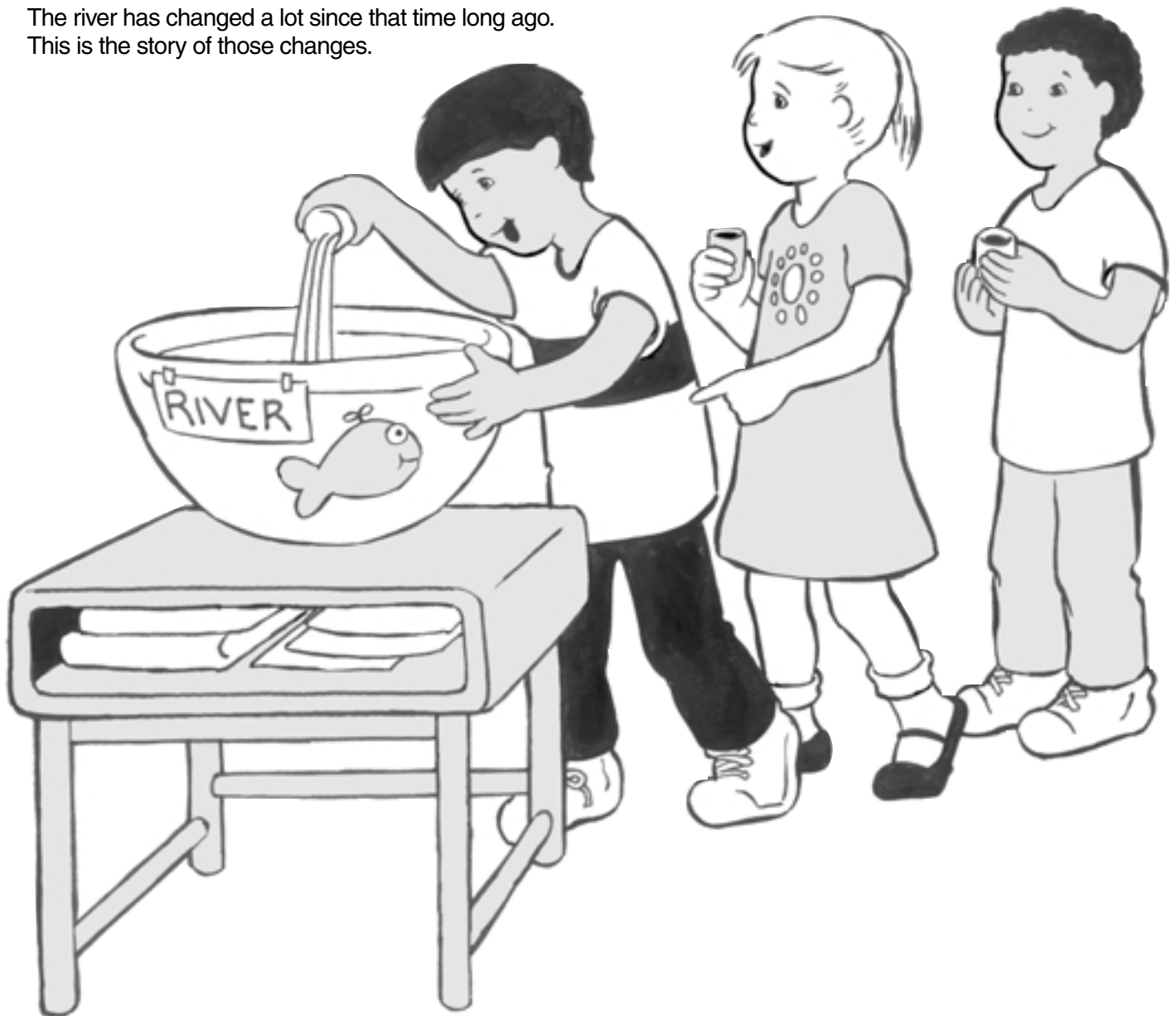
Eventually, more people traveled to this land from across the ocean. They found rich soil for farming, forests full of wildlife, and a river that provided plenty of food and water. It was a perfect place to live.

Question: How do you think the new people used the river?

(**Possible answers:** for water to drink, cook with, bathe and wash clothes in; to catch fish from; to go boating on; to move supplies from place to place)

Question: Do we use the river the same way today? (*Answers will vary*)

The river has changed a lot since that time long ago. This is the story of those changes.



Listen for the name of what's pictured on your slip of paper. When you hear your picture named, walk up to the teacher, get the matching container, and dump what's inside into the river.

[NOTE: Be sure to stand to the side, so the whole class can see the bowl.]

Years went by, and once in a while there were big storms. Strong winds whipped through the **TREES** and blew leaves into the water.

More and more people moved to the area. Gradually, a city grew up around the river. People drained swamps and cut down forests to build houses, schools, churches, stores, roads, hospitals and many other buildings. Rains washed loose soil from these **BUILDING SITES** into the river.

Questions: Is this water safe to drink? [If the response is "no," ask if the river had leaves or soil in it when people long ago drank from it.] Would you swim in it? Is it safe for animals to drink and fish to swim in?

At first, the city was small. Upstream, **FARMERS** planted crops to feed all the people as the city grew. They used chemicals called fertilizers to make their crops grow faster. Some farmers kept pigs and other animals in **BARNYARDS**. As rainwater drained out of the fields and barnyard, it carried some of the fertilizers and manure into a little creek behind the farm. The creek flows into the river.

Question: Would you drink this water now? Would you swim in it? Go boating on it? Is it safe for fish and animals?

Now, the city along the river has grown to be one of the largest cities in the country. Many people live and work in and around the city. Many businesses provide services for the people. Several **FACTORIES** make things

that people want, like cars and furniture, but the factories leak paint and other chemicals into the river. These pollutants cause the fish to become sick.

As people move about in their busy days, they often drive from place to place. Traffic jams are a big problem for **DRIVERS** who take their cars to and from work. If a car is not taken good care of it might also leak oil or other fluids, which will be washed off the roads and into the river with the next rain.

A boy in the city is out **WASHING THE FAMILY CAR**. The soapy water rushes down the driveway into the storm drain by the curb; the storm drain empties into the river. The grease and grime on a car contains tar from the roads, very tiny bits of rubber from the wearing of the tires, and rust. If the boy had gone to a local car wash instead, the water would have been cleaned before it went back into the river or was recycled.

On nice days, many people head down to the river. Some zoom up and down the river in **MOTORBOATS** and don't notice that a little engine oil leaks into the water. The oil will not mix with the river water, but will float on the surface. It will coat the feathers of ducks or

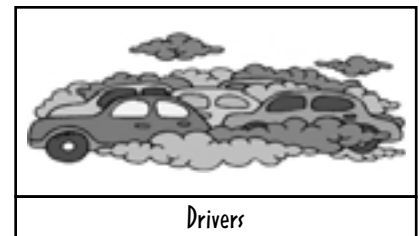
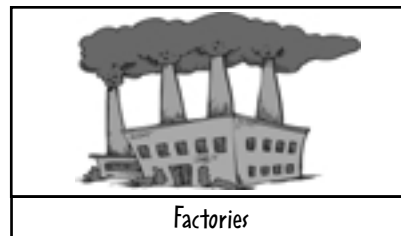
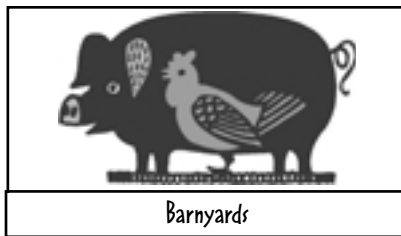
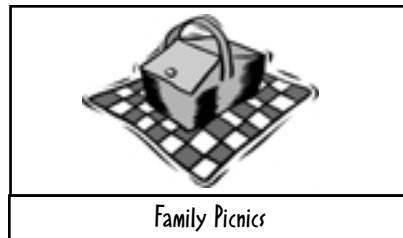
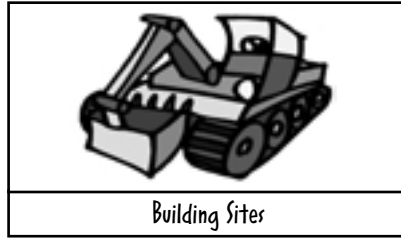
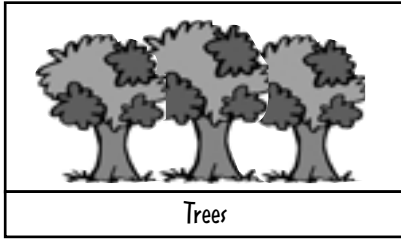
other birds that paddle around on the water looking for food, making it harder for them to stay afloat or fly. Lots of people are having **FAMILY PICNICS** in the parks along the river, too. Some of these people have left trash on the shore. With the next storm, that trash will wash into the river. On the shore a **PERSON FISHING** snags a hook on a log. Instead of untangling it, the person fishing simply breaks off the snagged piece of the nylon fishing line and lets it fall into the river.

The land is no longer wild, and the river has changed a lot over the years.

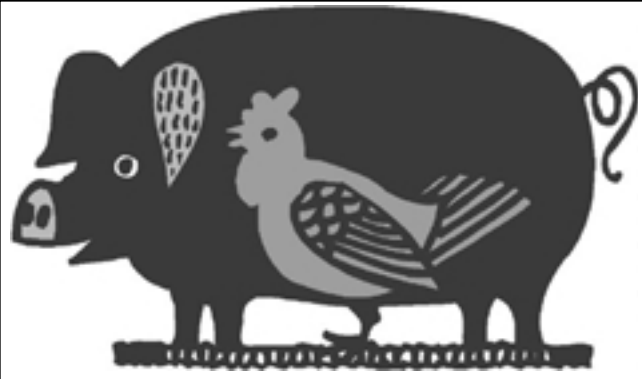


This activity was originally developed by Hard Bargain Farm Environmental Center, Accokeek, MD.

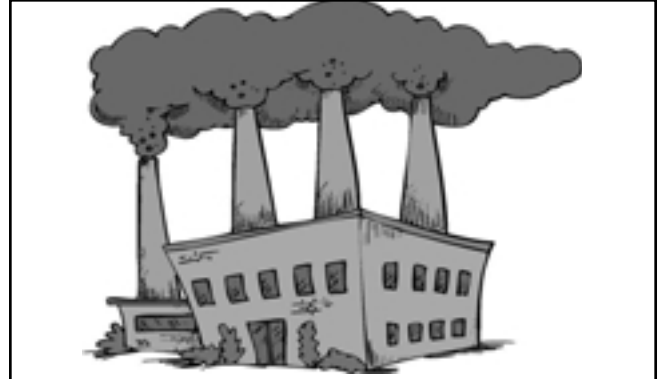
Canister Labels



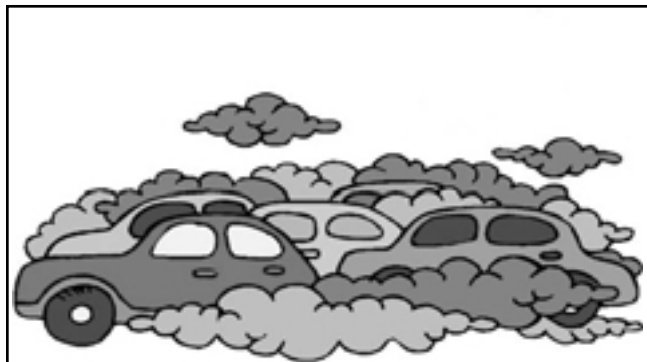
Character Nametags



Barnyards



Factories



Drivers



Washing the Family Car



Motorboats

Character Nametags



Trees



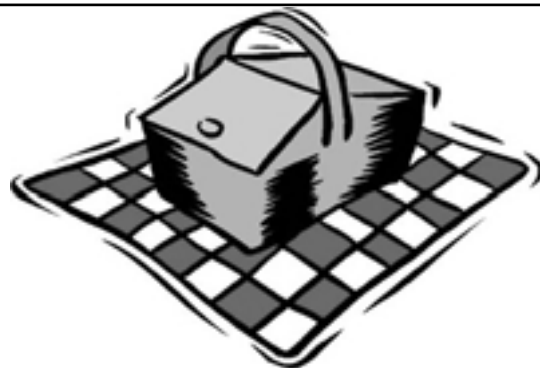
Building Sites



Farmers



Person Fishing



Family Picnics