

Clean River Curriculum for Grades 1–4

This set of classroom activities has been compiled to assist you in teaching your students about their role in keeping the Red River as clean as possible. Special emphasis has been placed on storm water and preventing its contamination as it makes its way to the river.

“Our River” (activities taken from National Geographic’s *Geography Action! Rivers 2001*, which can be found at www.nationalgeographic.com)

This activity is an introduction to river systems in general. Materials needed include:

- A diagram of a river (included as file **River_System.pdf**).
- Copies of the “River Puzzle” (included as file **River_Puzzle1-4.pdf**), cut into the individual pieces.
- Six or seven 8½-in. H 11-in. pieces of construction paper.
- Glue, glue stick, or paste.
- Crayons or colored pencils.
- Optional: Magazine pictures of things that students could add to the puzzle.

Begin a classroom discussion by having students examine the diagram of a river. Discuss each part of the river. Explain that the river is part of a larger system called a watershed. A watershed is all of the land area that drains to a specific wetland, lake, stream, or river. Because rain and snowmelt wash pollutants into the nearest water body, protecting a lake or river means that we have to prevent pollution throughout its watershed.

Ask the students, “How do people use rivers?” Write their answers on the blackboard. Their answers may include:

- Freshwater needs such as drinking; brushing teeth; taking showers and baths; flushing toilets; cooking; washing dishes, clothes, and cars; watering lawns; filling swimming pools.
- Farm needs, such as irrigation and watering farm animals.
- Recreation (boating, fishing, etc.).
- Transportation.
- Industry and manufacturing.
- Habitats for wildlife, fish, and plants.

After the students have listed ways in which people use rivers, ask them, “How do people change rivers?” Their answers could include:

- Building dams to store water, control flooding, or provide electricity.
- Polluting with fertilizer and pesticides that run off from farms and lawns.
- Disposing of oil, grease, or trash improperly.

Because this may not be a topic the students have considered before, this may require that leading questions be asked.

Tell the students that the class will create rivers out of puzzle pieces by groups. The goal is to put the pieces together to create a healthy river that benefits the environment, humans, *and* wildlife. ***There is no right or wrong way to assemble the puzzle.***

Only two pieces (the source and the mouth) must be placed in certain positions. The width of the river is the same in every piece except at the dam and reservoir. Not all of the pieces must be used. If the students would like, they could name and label places on the map, such as Duncan's Dam or Maggie's Reservoir. As they decide where to place the pieces, ask questions that will prompt discussion, such as:

- Where would the source of the river be?
- Where might a farm be?
- Where could you find wetlands along a river?

Students should be encouraged to suggest ways that pieces might be moved and to decide as a group the order in which their pieces should be placed. When each group is satisfied with its river, have the students glue the puzzle pieces on construction paper, color the river, and give it a name.

After the rivers are completed, discuss how students feel about them. Is there anything that they would change about their river? Would they be happy if they lived near the source of the river? If they lived further downstream?

Compare the various rivers and have the students point out differences between them. Emphasize that all rivers are different and therefore have different conservation needs. The important point to make is that a river is part of a system (the watershed) and that changes within the system affect the *entire* system.

To highlight this point, your students could play the "Web of Life in the Watershed" game.

"Web of Life in the Watershed" (adapted from pp 2-8 and 2-9 in the U.S. Environmental Protection Agency (EPA) Publication EPA/600/K-96/001, *World of Fresh Water: A Resource for Studying Issues of Freshwater Research*)

Materials needed for 20 students include:

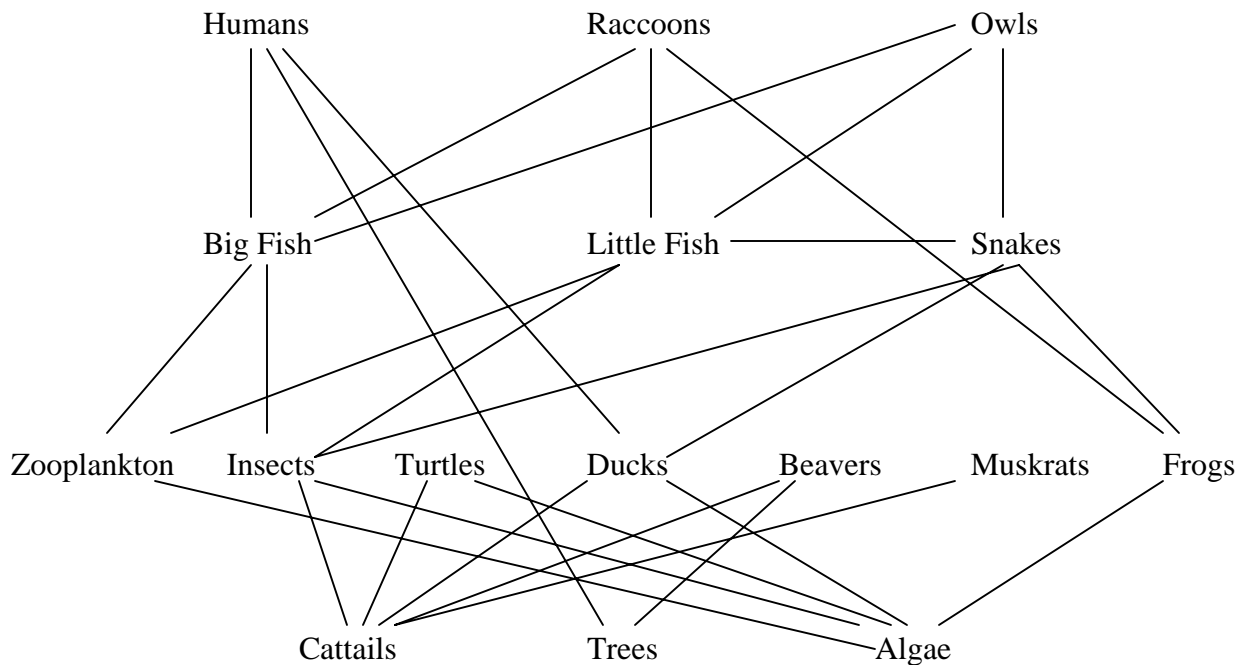
- A ball of yarn.
- 5-in. H 7-in. cards with pictures or words showing different elements within the watershed, including sunlight (2) ; water (2); plants: cattails, trees, and algae; plant eaters: microscopic animals (called zooplankton), insects, turtles, ducks, beavers, muskrats, and frogs; medium-sized animals: snakes, little fish, and big fish; and predators: humans, raccoons, and owls.

Discuss the importance of having a variety of plants and animals within the watershed. Ask the students which part of the watershed is the most important: the large, visible animals and plants or those that we do not usually see or think about? Or are they *all* important?

Provide an element card to each student. There will be two “sunlights” and two “waters.” It will be easiest to build the web if the students are lined up so that the plants stand in a row in front of the plant eaters, who stand in front of the medium-sized animals, who stand in front of the predators. Connect the students with yarn as they demonstrate relationships (see the diagram). Because sunlight and water are required by all members of the watershed, it is easiest if there are two of them. They will connect to all of the other members of the web. The yarn may have to be cut if it becomes cumbersome. It will become clear that all of the members of the watershed are connected. Try tugging on one link of the web and see how many students can feel it. If every student who feels the tug pulls on the lines he or she is holding, the original tug will ripple through the whole community just as changes in the watershed affect many organisms.

Sunlight

Water



Water

Sunlight

“Storm Water Memory Game”

Explain to the students that storm water runoff is rain or snowmelt that runs into the river. Any pollutants that runoff picks up also find their way to the river. There are things that we can do to prevent storm water runoff pollution. This game is played like the “Memory” game. The students are divided into small groups. The cards are laid face down on a table. Each student turns over two cards. If they match, the student keeps the pair of matched cards. If they do not match, the student must turn them face down again and the turn passes to the next student. The student with the most pairs of cards when all of the matches have been made is the game winner.

Materials needed:

- As many sets of “storm water cards” as groups of students. The cards can be made by printing out the file **stormwater game.pdf** and cutting them out (this file is an EPA file from its storm water curriculum Web site that can be found at <http://cfpub.epa.gov/npdes/stormwatermonth.cfm>).

Take Home

To reinforce the ideas learned during this lesson, **bookmarks** can be printed from the EPA file **bookmark.pdf** for the students to take home.

Additional Activities

Learning on this topic can be continued and enhanced by having the students do one or more of the following activities:

- Write a poem about a river.
- Create a collage about a watershed.
- Figure out how much water their family uses in a day.

Perhaps your class can even stencil warnings near storm drains in the neighborhood to remind people to keep the river clean by preventing pollutants from entering the storm drains (ask the city for permission first).