

Pollution Solution

Lesson Focus: water pollution, point source pollution, non-point source pollution

Learning Objectives:

- Students will discuss what water pollution is.
- Students will be able to define point source pollution and non-point source pollution.

Enduring Understandings for the Lesson:

- Water pollution is contamination of water and is caused by products we use every day.
- Everyone contributes to pollution and everyone can take steps to help reduce pollution.

Georgia Performance Standards Addressed:

S3CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

- a. Offer reasons for findings and consider reasons suggested by others.

S3L2. Students will recognize the effects of pollution and humans on the environment.

- a. Explain the effects of pollution (such as littering) to the habitats of plants and animals.
- b. Identify ways to protect the environment.

Grade Level: Third Grade

Materials:

- Pictures of your watershed from the headwaters to the Ocean
- Images of pollutants (car exhaust, sediments in a stream, polluted water flowing from a pipe, animal waste) and trash items (cups, paper, bottles, bags, oil cans, etc.) (about 10)
- Map of your watershed

Time Needed: 30 minutes

Background Information: The Earth is about 70% water. Water is the basis of all life and without water there would be no plants or animals. People need water to live, but we are also doing things that pollute our rivers, lakes and Ocean. Pollutants are

substances that make the water unclean or unusable, or that are harmful to the plants and animals that depend on it. Some sources of pollution are factories (industrial runoff, thermal pollution), farms (fertilizer, pesticides, and animal waste) and homes (fertilizers, pesticides, trash, and energy usage).

Water pollution affects drinking water and rivers, lakes and Ocean all over the world. If the pollution comes from a single, specific source, it is called point source pollution. For example, an oil spill that comes from one place is point source pollution. If the pollution comes from multiple sources or the source cannot be identified, it is called non-point source pollution. For example, pollution in the air and water can come from car exhaust, which comes from many different cars in different areas, so it is called non-point source pollution.

Once pollution enters water, land or air it will eventually make its way through a watershed. A watershed is the drainage basin for water, rain, and snow melt (any form of precipitation) from an area. The water will continue to flow until it reaches a lake, wetland or the Ocean. In turn all of those areas may also be affected by the pollution in that watershed.

Pre- Activity: “What is a Watershed? Lesson – introduction to the concept of a watershed: <http://www.georgiaaquarium.org/media/pdf/education/watershed.pdf>

Learning Procedure:

1. Review what a watershed is and have a map of a watershed s a reference .
2. Place various trash and pollution items around the room.
3. Have students list specific items in the classroom and other items at home that may be defined as pollution. Write them on the board but divide them into two categories - point source and non-point source pollution but do not use or write those terms until later.
4. Ask them where the pollution originates - (people dumping illegally, wind , development, animals, septic/sewer systems)
5. Ask students how pollutants like the ones on the board end up in our rivers, streams and the Ocean. Record ideas (rain carries them to streams, then rivers, lakes, etc. the wind, illegal dumping)
6. Introduce and define the term point source pollution and non-point source pollution using the list on the board. Write the appropriate term for the pollutants.
7. Ask the students to describe the impacts pollution has on animal and plant habitats.
8. Solicit ideas from students on how they can prevent pollution from entering our waterways.

Important note: Though factories and large farms are major polluters, for this lesson focus mainly on types of pollution that the students themselves can have some control over (such as litter, pet waste, and power plant emissions), then focus on what they personally can do to help prevent pollution (recycle, don't litter, pick up after pets, and reduce their energy usage and water usage). At the end of the lesson, students should feel empowered rather than disheartened.

Extensions:

1. Organize a school yard cleanup and have the students collect data on what they found. Afterwards have the students determine percentage of each item found and look for sources of the trash they found.
2. Have the students write letters to the other classrooms and the administration at your school inviting other classes to join them in trash pick-up days and encouraging other students not to litter. In the letters have the students explain the problem and the importance of helping clean up the school.
3. Have the students research the term *marine debris* and ask them to explain what it is and why it is harmful to our Ocean. Ask them to identify possible sources of *marine debris*.

Resources:

Teaching Center EPA - <http://www.epa.gov/teachers/water.htm>

NOAA Gray's Reef National Marine Sanctuary - <http://graysreef.noaa.gov/>

Georgia Aquarium - www.georgiaaquarium.org

NOAA Office of Education - <http://www.noaa.gov/>

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This activity is a product of the Rivers to Reef Educators Workshop sponsored by the Georgia Aquarium and Gray's Reef National Marine Sanctuary in which the author was a participant. For more information about this workshop, Georgia Aquarium, or NOAA Gray's Reef National Marine Sanctuary, please visit our websites at www.georgiaaquarium.org or <http://graysreef.noaa.gov/>

