

Protecting Our Backyard

Lesson Focus: local watershed, point source pollution, non-point source pollution

Learning objectives:

- Students will identify variables that impact our schoolyard creek and ultimately our watershed.
- Students will create brochures showing the negative impacts on our watershed.
- Students will understand the importance of a healthy watershed and their connection to the watershed.

Enduring Understandings for the lesson:

- Our schoolyard and creek are part of a watershed.
- We all have a part to play in protecting the watershed.
- We can have a positive effect on our watershed by informing our community about pollution.

Georgia Performance Standards Addressed:

- **S4L1. Students will describe the roles of organisms and the flow of energy within an ecosystem.**
 - c. Predict how changes in the environment would affect a community (ecosystem) of organisms.
- **S4CS3. Students will use tools and instruments for observing, measuring, and manipulating objects in scientific activities utilizing safe laboratory procedures.**
 - c. Use computers, cameras and recording devices for capturing information.
 - d. Identify and practice accepted safety procedures in manipulating science materials and equipment.
- **S4CS4. Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.**
 - a. Observe and describe how parts influence one another in things with many parts.
- **S4CS8. Students will understand important features of the process of scientific inquiry.**

Students will apply the following to inquiry learning practices:

 - a. Scientific investigations may take many different forms, including observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments.
 - b. Clear and active communication is an essential part of doing science. It enables scientists to inform others about their work, expose their ideas to criticism by other scientists, and stay informed about scientific discoveries around the world.

Grade level: 4th**Materials:**

- Watershed maps- link under resources (one map for each group)
- Street maps (one for each group)
- Digital cameras and computers
- Microsoft Publisher
- Paper and colored pencils
- Clipboards and pencils
- Chart paper

Time needed: three to four 50 minute class periods

Background information:

Georgia has 52 major watersheds. A **watershed** is the land area from which water, sediment and dissolved materials drain to a common point along a stream, wetland, lake, or river. For each watershed, there is a drainage system that conveys rainfall to its outlet. A watershed's boundaries are marked by the highest points of land around the body of water. The watershed in which we live is greatly affected by what happens in our schoolyard and neighborhood.

There are two types of pollution that impact our watershed. **Point source pollution** is a type of pollution that can be tracked down to a specific source such as a factory discharge pipe. The United States has made a serious effort to clean up point source pollution coming from industries and sewage treatment plants. **Nonpoint source pollution** is pollution that cannot be traced to a specific point, but is from many individual places such as urban or agricultural runoff. As runoff moves, it carries human-made pollutants such as, fertilizers, oil, grease, sediment from construction sites, salt, animal wastes, into our lakes, rivers, wetlands, coastal waters and drinking water.

Learning Procedure:

1. Review the term *watershed* and introduce the Georgia watershed map. See if the students can identify what watershed the school is located in using the watershed maps. Next have them look at street maps and locate their school and nearest water body. Have them trace the stream to the ocean noting the various streams, creeks, and rivers they traveled. Were they correct in their guess of what watershed they live in? or Assess whether or not they correctly identified their watershed.
2. Discuss the terms *point source* and *nonpoint source pollution*. Have students predict what types of pollution they might observe on our campus.
3. Take students outside to your playground and/or local creek. (If you do not have a water source on your campus you could take a field trip to the nearest creek or stream.) Tell students to take a walk around the campus and make observations about things they see that could impact our watershed. Students should make

notes as they walk. Be sure to discuss proper safety and where they can go. Or if permissible take trash bags and collect debris as you walk along and then sort the trash by category such as cigarette butts, plastic containers, plastic bags, aluminum cans, paper, etc. to determine which category has the most and then ask students to list likely sources of each category. List items that cannot be easily carried back and again sort by category and determine likely sources.

4. After the walk, head back inside to discuss the student's observations from the walk. On chart paper, make 2 columns: Point Source Pollution and Nonpoint Source Pollution. Have students record their observations in the correct columns on the chart. Also, discuss the positive things that students observed.
5. Discuss with students possible watershed conservation activities that could take place to protect the watershed. Also share with students, current conservation activities happening in their watershed. (See Georgia River Networks under resources)
6. Divide class into small groups. Tell the students they are going to head back outside with a digital camera to take pictures of examples showing point source and nonpoint source pollution. Also have them take pictures that show healthy areas.
7. Ask students to create a list of what people should do to help the environment be litter and pollution free.
8. As the culminating project for this lesson, have students create brochures about what they have observed and what they can do personally to help. The brochures can be created using Microsoft Publisher, Word or paper and colored pencils. First have students brainstorm ideas that will be in the brochures. Next, have students create a rough draft of their brochure. Possible items to include in the brochure:
 - Picture of healthy part of creek
 - Picture of pollution
 - Map of watershed
 - Ways in which we can keep our creek healthy
 - A catchy title/slogan
9. Alternative to #7. Ask students to identify various audiences they would like to inform of point and non-point source pollution. Audiences could be teachers, parents, friends, community leaders, business owners, etc. Ask them to brainstorm how best to reach each audience. For example many younger audiences now use social media to receive information and they may find that method better suited to communicate to various audiences. Using social media may also be "greener" in that no paper and ink are used. Also they may want to post a report of their discoveries to the school website and advertise in various ways to direct folks to that website for more information and what they can do to help.

Evaluation:

1. Have students present their brochures, power point, website report, UTube video, etc. to the rest of the class.

2. Distribute brochures or other produced product (they can be copied) to parents, teachers, and neighbors of the school.
3. Use the attached rubric for grading the brochure or other produced product.

Extensions:

1. Have students use the website ToonDo to create a comic strip about conservation of their watershed.
2. Have students create commercials to show on the closed circuit morning news show.
3. Have students write letters to the editor of their local newspaper, or local and State Representatives explaining the importance of conserving the watershed.

Resources:

- Watershed map:
<http://www.georgiaplanning.com/watertoolkit/Documents/WatershedPlanningTools/MapofGeorgias52LargeWatersheds.pdf>
- Adopt-A-Stream publications: *Getting to Know Your Watershed, Educator's Guide for Grades K-12.*
- Adopt-A-Stream website – www.georgiaadoptastream.org/home.html -for maps and other valuable resources.
- Georgia River Network - www.garivers.org – for information on all of the major watersheds and groups working in the watershed.
- Toondo website – www.toondo.com –for comic strip extension activity

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Protecting Our Backyard Brochure Rubric

Name _____

	Observer 0 points	Beginning Naturalist 1 point	Progressing Naturalist 2 points	Advancing Naturalist 3 points
Watershed is correctly defined				
Point source & Non Point Source Pollution is correctly identified				
Catchy Title				
Pictures of a healthy creek and example of pollution included				
Suggestions of ways to keep the watershed healthy are explained				
Brochure is completed neatly and is pleasing to the eye				
Correct grammar is used throughout brochure				

Total Points	Final Grade
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Teacher Comments: