

Persuasive Writing Exercise on Non-point Source Pollution

Lesson Focus: Non-point source pollution

Learning Objectives-

- Students will define non-point source pollution.
- Students will identify and write about sources of non-point source pollution
- Students will describe steps that individuals can take to reduce non-point source pollution.
- Students will practice informative and persuasive essay writing skills . If desired the protocol for GA High School Graduation Writing Test may be followed.

Enduring Understanding for the Lesson-

- Everyone contributes to non-point source pollution.
- Everyone can take steps to help reduce non-point source pollution.

Georgia Performance Standards Addressed

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

- b. Recognize that different explanations often can be given for the same evidence.

SCSh6. Students will communicate scientific investigations and information clearly.

- c. Use data as evidence to support scientific arguments and claims in written or oral presentations.
- d. Participate in group discussions of scientific investigation and current scientific issues.

SCSh9. Students will enhance reading in all curriculum areas by:

- c. Building vocabulary knowledge
 - Use content vocabulary in writing and speaking.

SEV4. Students will understand and describe availability, allocation and conservation of energy and other resources.

- f. Describe the need for informed decision making of resource utilization. (*i.e.* energy and water usage allocation, conservation, food and land, and long-term depletion)

SEV5. Students will recognize that human beings are part of the global ecosystem and will evaluate the effects of human activities and technology on ecosystems.

- c. Explain how human activities affect global and local sustainability.
- d. Describe the actual and potential effects of habitat destruction, erosion, and depletion of soil fertility associated with human activities.

SB4. Students will assess the dependence of all organisms on one another and the flow of energy and matter within their ecosystems.

- d. Asses and explain human activities that influence and modify the environment such as global warming, population growth, pesticide use, and water and power consumption.

ELA (9-12) W1. The student produces writing that establishes an appropriate organizational structure, sets a context and engages the reader, maintains a coherent focus throughout, and signals closure. The student

- a. Establishes a clear, distinctive, and coherent thesis or perspective and maintains a consistent tone and focus throughout.
- b. Selects a focus, structure, and point of view relevant to the purpose, genre expectations, audience, length, and format requirements.
- c. Constructs arguable topic sentences, when applicable, to guide unified paragraphs.
- d. Uses precise language, action verbs, sensory details, appropriate modifiers, and active rather than passive voice.
- e. Writes texts of a length appropriate to address the topic or tell the story.
- f. Uses traditional structures for conveying information (i.e. chronological order, cause and effect, similarity and difference, and posing and answering a question.
- g. Supports statements and claims with anecdotes, descriptions, facts and statistics, and specific examples.

ELA (9-12) W3. The student uses research and technology to support writing. The student

- a. Formulates clear research questions and utilizes appropriate research venues (i.e., library, electronic media, personal interview, survey) to locate and incorporate evidence from primary and secondary sources.
- b. Uses supporting evidence from multiple sources to develop the main ideas within the body of an essay, composition, or technical document.
- c. Synthesizes information from multiple sources and identifies complexities and discrepancies in the information and the different perspectives found in each medium (i.e., almanacs, microfiche, news sources, in-depth field studies, speeches, journals, or technical documents).
- d. Integrates quotations and citations into a written text while maintaining the flow of ideas.
- e. Uses appropriate conventions for documentation in the text, notes, and bibliographies by adhering to an appropriate style manual such as the *Modern Language Association Handbook*, *The Chicago Manual of Style*, *Turabian*, *American Psychological Association*, etc.

Grade Level-

High school- 9th – 12th grades

Materials-

Related Documents (These are selected web sites which may be used for instructional purposes or printed out for students to use as "Cited Documents" required for writing)

If Georgia High School Writing Test practice is desired, please use the Writing Prompt/Writing Situation/Directions for Writing (These follow the guidelines and format of the GA High School Graduation Writing Test)

- General expectations for the GA High School Writing Test: Time Constraints and Scoring
- Examples of Writing Prompts and Documents
- Steps in developing a persuasive essay: Writing to Persuade, Planning the Essay, Rough Draft, Revising and Proofing, Writing the Final Version

Time Needed-

Science content lesson : three classes with one class to introduce the concepts of non-point source pollution, one class for student research, and one class for student presentations. (Students may begin writing their essay in class if time permits)

*If Georgia High School Writing Test practice is desired, three class periods may be used to cover information related to the standardized tests and test requirements (GHSGT and Gateway Writing Tests), writing rough draft, proofing, editing and writing final version). (The explanation and student writing may be done in an English class if desired.)

Background Information-

Pollution includes everything that is introduced into air, water or soil that is harmful to its inhabitants. Most people assume that factories and other businesses are the main causes of pollution. It is important to understand what causes and contributes to pollution in order to protect the environment. Pollution can be categorized as either Point Source Pollution or Non-point Source Pollution.

Point source pollution comes from a single identifiable source. An example is a specific factory's discharges into the air or a body of water. Non-point source pollution is pollution that comes from many different sources, rather than a single specific site. These sources are undefined and not readily identifiable. Non-point source pollution is usually associated with rainfall runoff moving over the ground carrying natural and man-made pollutants into lakes, rivers, streams, wetlands, estuaries, coastal water and underground water supplies. Our homes, lawns, farms, and highway surfaces are all sources of non-point source pollution. Everyone contributes, in some way, to non-point source pollution.

Since non-point source pollution can enter a body of water in many different sources, it makes difficult to regulate and control! The Environmental Protection Agency (EPA) has determined that up to 96% of polluted bodies of water in the US are contaminated by non-point pollution sources. Public awareness on how to prevent non-point source pollution is important to reduce these sources pollution.

For example: pesticides and fertilizers are washed off farmland when it rains. These agricultural wastes could be channeled into lagoons where the pollutants will decompose before being released into waterways. Animal waste is another example of non-point source pollution. Animal feces from lawns, parks and streets can be cleaned up with a "poop scoop" so that it isn't washed into storm sewers along with rainwater.

Learning Procedure-

- A. Discuss with the class the differences between point source pollution and nonpoint source pollution.
 1. On the board, list different types of pollution named by the students.. Then ask students to categorize the source of the pollution.
 2. Next list the various land use categories that can cause nonpoint source pollution. (The answers should include: agriculture, construction, forestry, land disposal, surface mining, urban storm water runoff, hydrologic modification.)
 3. Ask students to brainstorm solutions.

- B. Divide the class into 4 groups and assign each group a question below to research. Have each group report answers back to the entire class.
 1. What is marine and coastal garbage? How long do various pollutants survive in the marine environment? What are the effects of pollution on the marine environment?
 2. What is the largest contributor of freshwater nonpoint source pollution? What are the long and short term effects? Who regulates this problem?
 3. What can be done to prevent nonpoint source pollution? Is it more difficult to control than source pollution? Why or why not?
 4. What is the difference between a storm drain and a sewer? Why does it matter what goes into a storm drain? Who controls what goes into the sewer and the storm drain.

- C. Have each student write an editorial for the school newspaper to educate others about the issue of non-point pollution. (Students may cite the given documents and use prior knowledge to write their editorial.)

Writing Situation: to make the public aware of non-point pollution and educate people what steps they can take to reduce these sources of pollution.

Be sure to address the following points in the article :

1. What is non-point pollution?
2. Why is it an important issue today?
3. Give examples of non-point pollution.
4. Explain what steps people might take to reduce non-point pollution.

Evaluation-

Rubric for the evaluation is based on the guidelines set in "The Four Domains for the Georgia High School Writing Test".

1. Content/Organization (40%) The writer establishes the controlling idea through examples, illustrations, facts, or details. There is evidence of a sense of order that is clear and relevant. This domain includes the following components:
 - Response to assigned task
 - Clearly established controlling idea
 - Sufficiently relevant supporting ideas
 - Clearly developed supporting ideas
 - Clearly discernible order of presentation
 - Logical transitions and flow of ideas
 - Sense of completeness
2. Style (20%) The writer controls language to establish his or her individuality. This domain includes the following components:
 - Effective word choice
 - Varied and effective sentence structure
 - Tone consistent with topic and purpose
 - Sense of audience
3. Conventions of Written Language (20%) The writer uses the conventions of written standard American English. This domain includes the following components:
 - * Appropriate usage (clear pronoun references, subject-verb agreement)
 - * Appropriate mechanics (proper spelling, capitalization, punctuation)
4. Sentence Formation (20%) The writer forms sentences correctly. This domain includes the following components:
 - Appropriate end punctuation
 - Complete sentences or functional fragments
 - Appropriate coordination and subordination

The Four-Point Scale

- 1- Inadequate
- 2- Minimal
- 3- Good
- 4- Very Good

Extensions-

The teacher, or selected students, might share with the class quotes from student's writing that were good models for example. The group might discuss ways in which they could improve their essays.

Hold individual conferences with students to follow up on their scored Rubrics. Analyze strong areas and weak areas which need improvement.

Resources-

Non-point Source Pollution: Urban and Suburban Areas (access 10/30/08)
<http://oceanservice.noaa.gov/education/kits/pollution/05areas.html>

Pollution Prevention Education Toolbox for Teachers (access 10/30/08)
<http://www.epa.gov/reg5rcra/wptdiv/p2pages/school.pdf>

Resources- Non-point Source Pollution Roadmap (access 10/30/08)
http://oceanservice.noaa.gov/education/kits/pollution/supp_pollution_roadmap.html

Pollution Runoff (Non-point Source Pollution) (access 10/30/08)
<http://www.epa.gov/owow/nps/MMGI/Chapter1/ch1-1.html>

Stop Pointless Personal Pollution! How everyday chores can harm your streams and lakes (access 10/30/08)
http://www.epa.gov/owow/nps/nps_edu/pdf/stop.pdf

What You Can Do to Prevent Non-point Source Pollution: Urban Stormwater Runoff (access 10/30/08)
<http://www.epa.gov/owow/nps/whatudo.html>

Pollution Runoff (Non-point Source Pollution): Do's and Don'ts around the Home (access 10/30/08)
<http://www.epa.gov/owow/nps/dosdont.html>

Pollution Runoff (Non-point Source Pollution): Managing Non-point Source Pollution from Households (access 10/30/08)
<http://www.epa.gov/owow/nps/facts/point10.htm>

<http://www.epa.gov/OWOW/NPS/facts/>

Opportunities for Public Involvement in Non-point Source Control (access 10/30/08)

<http://www.epa.gov/owow/nps/facts/point2.htm>

Non-point Source Pollution: The Nation's Largest Water Quality Problem (access 10/30/08)

<http://www.epa.gov/owow/nps/facts/point1.htm>

River Adventure on the Delaware (Page 4-5) (access 10/30/08)

<http://www.phillyseaport.org/RAD%20teacher%20packet.pdf>

Join a Stream Team! Dive into a clean water project (access 10/30/08)

http://www.epa.gov/owow/nps/nps_edu/pdf/join.pdf

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