Environmental Science Lesson Plan

Baton Rouge Groundwater

Essential Question: Can current management practices sustain Baton Rouge groundwater?

Objectives:

1. Students will identify the sources of water for East Baton Rouge Parish.
2. Students will define saltwater encroachment, describe how it is quantified, and interpret graphs, charts and other evidence of saltwater encroachment in the Baton Rouge region.
3. Students will compare trends in population growth and water usage in Louisiana and Baton Rouge.
4. Students will examine groundwater rights of individuals compared with the government's constitutional responsibility to protect natural resources.
5. Students will identify the roles of governmental agencies to manage groundwater resources.
6. Students will investigate the process of environmental decision making as they discuss current issues using applicable data.

Earth and Space Science GLEs

16. Evaluate the effectiveness of natural resource management in Louisiana (SE-H-B4) (SE-H-B5)
18. Identify the factors that affect sustainable development (SE-H-B6)
21. Analyze the effect of common social, economic, technological, and political considerations on environmental policy (SE-H-C3)
22. Analyze the risk-benefit ratio for selected environmental situations (SE-H-C4)
27. Describe how accountability toward the environment affects sustainability (SE-H-D5)

Scientific Inquiry GLEs

5. Utilize mathematics, organizational tools, and graphing skills to solve problems (SI-H-A3)
7. Choose appropriate models to explain scientific knowledge or experimental results (e.g., objects, mathematical relationships, plans, schemes, examples, role-playing, computer simulations) (SI-H-A4)
15. Analyze the conclusion from an investigation by using data to determine its validity (SI-H-B4)

Vocabulary: sustainability, aquifers, saltwater encroachment, conservation

Introduction:

Ask the students if they have ever wasted water. Brainstorm with the class to list ways people often waste water. Examples may include: letting the tap water run when you are not using it, a sprinkler that hits the pavement rather than the yard, washing only a few items in washing machine rather than a full load. Ask why we should be more conscious of water waste. Discuss if they think people can be forced to conserve water.

Teacher Instruction

Power Point slide presentation: 1) aquifers below Baton Rouge 2) Louisiana groundwater laws 3) groundwater management 4) saltwater encroachment

Student Engagement Activities:

Environmental Decision Making: Groundwater or Surface Water – students collaborate in groups to discuss the consequences of any particular group switching from groundwater use to surface water in order to establish groundwater sustainability and prevent further saltwater intrusion. (Materials: East Baton Rouge Parish water use, Student instruction guide and scoring rubric)

Water Use Comparisons – Students use data to compare East Baton Rouge Parish's water use with St. James Parish's water use in order to understand that different parts of the state have different resources with different needs. (Materials: East Baton Rouge Parish and St. James Parish water use, Student question/answer blackline master)

Math Connections: Water Conservation Adds Up – Students calculate how water conservation affects water withdrawals. (Materials, student calculators, Student question/answer blackline master)

Slogans for Sustainability - Students create bumper stickers or poster slogans for different governmental agencies to promote each agency's mission of groundwater sustainability. (Materials: Paper or poster board pieces, markers)

Closure:

Ask the students what they think the government or individuals should do if future evidence shows that the saltwater content is increasing in the public water supply and aquifers in the Baton Rouge area. Generate a discussion of why it is important for citizens to be informed on environmental issues in their community. Talk about ways in which citizens can be involved in decision making.