Got Water? (Scenario B: Learning Experience #1)
Lesson Plan

Summary
Working in teams, students study a waterway, lake, pond or wetland in their local area that should be considered a natural resource worth improving and maintaining in a sustainable way. Students will observe and describe the local body of water, develop a plan for its use by residents and visitors, and develop an advertising campaign for their project. When team plans are complete, students will consider practical problems such as encouraging participation in and support for their project.

Lesson Essential Questions:

1. What can citizen groups do to contribute to the responsible use and protection of aquatic natural resources?
2. How may wetlands and waterways be preserved and utilized by local residents for recreation and tourism?

Objectives
The students will:

- work productively as a part of a project team.
- use a variety of resources to investigate the background information necessary for this project.
- choose a local waterway, lake or wetland appropriate for this project.
- observe and describe the physical and biological characteristics of their study area.
- design and describe development plan for their area.
- design an advertising plan for their project.
- keep accurate, complete records in a journal.

Materials for *Got Water*

- The following materials will be needed with one copy per group:
  - *Description of the Study Area* (Student Sheet #1)
  - *Developing a Plan* (Student Sheet #2)
  - *Finishing Touches* (Student Sheet #3)
- Letter to Parents: *Learning Science in the Field*, one per student
- Computer and internet access for each team
- Notebooks or small binders or folders to be used as journals, one per student
- One camera for each team (if available)

Grade Level: 8-12

Subject Areas
Environmental science, biology, language arts, geography, economics, history

Timeline
Teacher preparation: 60 minutes
Student Learning Experience: Three, 45-minute class periods plus a field visit

Setting
Classroom; library or computer lab; local waterway, lake/pond or wetland

Skills
Problem solve and develop a plan as part of a team, research in print materials and on websites, observe and describe an outdoor area, articulate and communicate ideas orally and on paper

Vocabulary
Aquatic, eco-tourism, habitat, natural resource, terrestrial, sustainable, macroinvertebrates

Advance Preparation Required

- Make arrangements for your classes to go outside for a field trip if an appropriate study area is close to your school.
- Make copies of the student sheets listed, one for each project team.
- One week before beginning of the Learning Experience:
  Prepare and distribute copies of the letter, *Learning Science in the Field*, one per student to take home and return signed by a parent.

Procedure

1. Introduce this learning experience by asking students to write in their journal a definition of a natural resource and three or four examples of natural resources that can be found in their local area. Lead a class discussion about natural resources and recreation, making sure to address the following:
   - Develop a class definition of what a natural resource is.
   - What is your definition of "recreation?"
   - Name and describe a location or land feature in their area that could be used for recreation.
   - Would you consider these natural areas that can be used for recreation a *natural resource*?

2. Assign students to project teams of three to four (3-4) members. Each team member should be given a responsibility such as researcher, recorder, or communicator. Grouping students with a variety of abilities will promote peer teaching and differentiation of instruction.

3. Post the essential questions and explain that all students should be able to answer the essential questions by the time they are finished with this scenario. Present the challenge to the students by asking them to read it and decide within their group a location in your area that they want to work on. Students should get approval from the teacher once a potential site has been agreed upon by the group. Ensure there are several different locations possible within the class, each of which must be safe places for students to visit. Choosing public property like parks, state lands and school sites will avoid problems of access to privately-held land. Students should describe in their journals how and why they made their choices.

   Optional whole-class project: If your school's situation doesn't lend itself to asking each team to choose and visit a different location in your area, you could take all of your students to a single nearby location. Ask each team to develop a unique plan and hold a class competition to choose the best plan for the site.

4. Students will use *Description of the Study Area* (Student Sheet #1) to describe the area they have chosen. Groups should include the location, approximate size and what the area looks like. Students will list what plants and animals live in the habitat and include a labeled picture or sketch of the chosen site.

5. After visiting the site, student teams will develop a plan to promote and sustain recreational use and eco-tourism in each area. Teams will record all team member ideas in their journals, including those that the group decides to discard.
   Developing a Plan (Student Sheet #2) provides space for the team's final answers to these questions:
   - What is already there? Are there any trails? Boat access? Fishing spots? Tables for picnicking, etc.? Students may find facilities such as trails for hiking and biking, boat access, boat rentals, fishing, guides, education programs, bird watching, picnicking, etc.
   - What would you and your family (all ages) and friends add to this location to make it more appealing and usable for recreational use? Consider the cost and people power that would be required. Visit the Friends of Chemung River Watershed web site for some ideas. www.chemungriverfriends.org

6. Once the plans have been prepared, teams should consider solutions to the following practical problems. Teams will record all ideas and answers on *Finishing Touches* (Student Sheet #3).
   - What information is needed to develop programs such as self-guided hikes and paddle trails? Where will you go for this information? Answers should include maps, species lists and habitat details.
   - What already exists in the way of hotels, restaurants, equipment rentals, etc., that could support visitors from outside the area? What would be needed if your plan is a success and there is a doubling or tripling of tourists? Answers could come from resources such as the AAA, travel sites, your local tourist bureau or chamber of commerce.
   - How do local residents feel about the plan? Is their opinion important? How could students find out? Answers may include suggestions such as surveys and interviews of residents.
   - How will you spread the word? Include ideas for nearby and regional advertising. Students could refer to web sites of similar attractions, newspaper travel sections, TV and magazine ads and sample travel brochures.
   - How will your students encourage individuals and groups in the region to get involved in developing responsible attitudes and interest in the resource? Examples include appealing to existing groups adult and youth outdoor activists, sponsoring school projects, training and coordinating the work of citizen scientists, and teaming up with business organizations for volunteers and funding.