

## Teacher’s Guide: ACTIVITY 3

### PROPERTIES OF WETLAND ECOSYSTEMS

#### OVERVIEW:

We will have the students examine water samples from three aquatic habitats—a blackwater stream, a Carolina bay, and a pond that receives polluted runoff from coal waste. Instructors will demonstrate the measurement of two water quality variables: water hardness and dissolved oxygen. Students will examine the water samples and perform several tests to determine other water quality variables, including pH, iron, phosphates, and nitrates. Results will be examined in the context of the organisms that live in these three habitats.

#### TERMS WE WILL BE USING:

- **Wetlands related**—ecosystem, environment, habitat, niche, food chain, producer, consumer, decomposer, metamorphosis, adaptation, Carolina bay, wetland, landforms, amphibian, population, community, life cycle, zooplankton, aquatic biologist, resources, camouflage, migration, hibernation, nutrient,
- **Science process related**—observation, hypothesis, comparison, classification, prediction, independent variable, dependent variable, inference, data

#### OUTLINE OF WORKSHOP:

The first 40 minutes will be a review of the last lesson (soils) and an introduction to wetland habitats and water quality. We will introduce the students to this week’s featured SREL scientist, Dr. Barbara Taylor, who is an aquatic biologist. In the slide intro we will discuss three local wetland habitats (a Carolina bay, a blackwater stream, and an industrial pond) and describe some organisms found in each. This content will draw heavily from Units A and B of the science textbook, as we talk about animal adaptations to life in different ecosystems. In our examples we will discuss the adaptations that different species have for life in aquatic habitats that differ in water quality. We will conclude the intro by introducing the students to specific water quality measures such as dissolved oxygen, total suspended solids, and chemical contaminants, as well as “parts per million” as a unit of measure. After the slide show we will have one or two demonstrations pertaining to local pond life.

Students will then break out into groups of four to conduct their own water quality tests, with each group assigned one of the three wetland habitats. After discussion and demonstrations about using color tests to measure different variables, students will test their own water samples. One pair of students will conduct two tests (pH and iron), and the other pair will conduct two different tests (nitrate and phosphate). Students will share their test results within their group so that each student has a completed data sheet.

After collecting and sharing their data, groups will share the data from their habitat with other groups. During “science seminar” closure we will discuss the differences in water quality among the three habitats.

#### STANDARDS COVERED:

Sci	Life Sci	Organisms and environment	Characteristics--biomes, biodiversity
Sci	Life Sci	Organisms and environment	Characteristics--senses, detection of cues, behavior
Sci	Life Sci	Organisms and environment	Characteristics--inherited traits, learned behaviors, classification
Sci	Life Sci	Organisms and environment	Organisms and environment--intra- and inter-specific interactions

Sci	Life Sci	Organisms and environment	Organisms and environment--interactions with environment
Sci	Life Sci	Organisms and environment	Organisms and environment--causes of environmental change
Sci	Earth Sci	weather and climate	Changes in earth and sky--daily and seasonal weather patterns
Sci	Inquiry	Process skills	observe, classify, measure, communicate, infer, predict, hypothesize
Sci	Inquiry	Inquiry skills	Plan and conduct simple investigations
Math	Alg-S1	Understand patterns, relations, and functions	Describe, extend, and make generalizations about geometric and numeric patterns
Math	Alg-S1	Understand patterns, relations, and functions	Represent and analyze functions, using words, tables, and graphs
Math	Alg-S2	Represent and analyze mathematical structures	Use variables
Math	Alg-S2	Represent and analyze mathematical structures	Use equations
Math	Alg-S3	Use models to represent and understand quantitative relationships	
Math	Alg-S4	Analyze change	How one variable affects another
Math	Alg-S4	Analyze change	Compare varying rates of change

## SUGGESTED FOLLOW-UP ACTIVITIES:

### Science and Math

- **Follow up sheet**—Do the science/math follow-up sheet for the Activity 3 wetlands water quality workshop.
- **Pamphlet**—A pamphlet is a publication that briefly explains a topic. Sometimes it includes photographs or illustrations. Design a pamphlet on a on the type of wetland known as Carolina bays.
- **Poster**—Draw a pH scale on a large piece of poster board ranging from a pH of 0 to a pH of 14 (like a time line). Research the pH of things around you that have a pH of 0, of 1, of 2, all the way to 14. Draw these items onto your pH scale in the appropriate places; label your poster and share it with your classroom.

### Language Arts

- **Binder (Reading)**—Make a collection of wetlands articles that interest you, read them, and then share the binder with other students in your class.
- **Letter to the Editor (Writing)**—A letter to the editor is a written letter to editor of a newspaper or magazine that expresses your opinion on a topic. It should include facts to support your opinion. Write a letter to the editor of a newspaper on the importance of wetlands in Aiken.
- **Play (Drama)**—Using the script (which we can provide) to the story “Wetland Wonders,” create a play that your class performs for a younger grade level.
- **Flashcards (Vocabulary)**—Make vocabulary flashcards from the Activity 3 definitions sheet and spend 10 minutes every day studying your cards.
- **Word Search (Vocabulary)**—Create your own word search puzzle on “Types of Wetland Animals.”

### Technology

- **Internet Research**—Use the Internet to do further research on blackwater streams.
- **Webpage**—Work with SREL instructors to create a webpage on local wetlands

### Art

- **Photo Essay**—A photo essay is a series of photographs that tell a story. Use a digital or still camera to create a photo essay of local streams.
- **Mural**—A mural is a picture painted or drawn on a wall or on long pieces of newsprint or other paper. Create a mural on the plant and animal life of Upper Three Runs Creek.
- **Scientific Drawing**—Choose an animal that goes through metamorphosis and draw its life cycle on poster board. Label all the steps and use arrows to show the correct order of the steps in the cycle. Color in your drawing with appropriate colors using markers or paint. Give a brief oral presentation about your poster on “life cycles” when it’s completed.