

Lesson Title: “Wet & Wild” Wetland Ecology

Topic: Life Science

Grade Level: 9-12 Grade

Length: 3 hours

Location: Freshwater Beaver pond Swamp, Hardwood Forest Seeps,
Ecology Laboratory

Lesson Description

Kayaking through a black-water beaver pond swamp ecosystem students will get to discover from a “beaver’s-eye view” all of the wonders that created and sustain Playcard Swamp. Students, simultaneously working in terrestrial wetland teams, will collect a variety of aquatic insects & pond life with dip nets, sieves and collecting trays. Students will then analyze and release their catch into the indoor or outdoor living “swamp” to see the cycle of life as wetland carnivores consume some of their catch.

Classes may plan a 30-minute lunch break or eat after the lessons.

Lesson Rotations:

1 hr for introduction/safety procedures/content skill acquisition/summary

2 hrs each for terrestrial wetland collections/study and kayaking

Kayak/Aquatic Safety Rules:

Properly fitted lifejackets worn at all times. No standing or jumping out-of kayaks. Everyone has to kayak with a buddy. At least one good swimmer per boat. No non-swimmers allowed with other non-swimmers. A properly trained adult life guard safety swimmer must oversee kayaking at all times.

The swamp-ferry and riparian (bank) may be used for wetland collections as well as the bank (Maximum 10 persons/ferry trip with adult).

No picking of wetland plants is allowed.

Essential Questions

Why are wetlands important in South Carolina?

Is Playcard Swamp a “Clean/healthy ecosystem, or an unhealthy/polluted ecosystem?”

Key Questions

1. What are some physical properties of wetlands as opposed to “uplands” that affect populations of organisms that live there?

Example: Why is the black-water black? What is its pH? How does this affect wetland plant and animal soils? What are “hydric” soils.

2. What wetland habitats are found at Playcard?

Answer: *Seeps, ephemeral bogs, streams, and black water beaver-pond swamps.*

3. What are some types of natural plant and animal communities found in Playcard’s wetlands?

4. What special adaptations do some plants have to deal with the stresses of their respective wetland homes?

Example: Lilly pads pump oxygen through their roots to the bottom of the pond to aerate themselves because of the low oxygen in the water.

5. Are any wetland plants edible vs. poisonous? What other human uses of wetland plants are there?

Example: Some edible wetland plants are cat tails and white-water lilly pad roots.

If ingested, some poisonous plants include the Blue-Flag Iris, witch hazel, and several mature ferns.

6. How does energy flow through a wetland ecosystem?

Answer: Through the trophic pyramid and web-of-life research “ecology.”

7. How can aquatic macro-invertebrates be used as bio-indicators to monitor the health of wetlands?

8. What is the difference between wetland “hydric” vs. upland “mesic” or “xeric” soils?

9. What are some important values of wetlands and what are the main threats to their continued existence?

Answer: Values Water filtration/percolation into soils, increased water table, flood control, increased wildlife habitat.

Threats: Overdevelopment and de-forestation of riparian zone, dredging and/or filling wetlands, pollution such as mercury, man-made litter, sewage seepage, over-fertilization/pesticide use etc.

Activities and/or concepts related to S.C. Science Process and Content Standards:

Process Content

Activity/Content Standards

(Activation Activity)

1. Open by physically connecting the path of energy flow through a wetland. B-3.6
2. Wetland species survey using live habitat exploration as-well-as taxidermy and botanical exhibits.
3. Snakes of SC and “wilderness-common-sense” reptile, bee, and fire ant lesson. B-6.2
4. Introduction to Bio-assessment & Indicator Species
5. Adventure aquatic exploration pond study B-1.2
6. Live animal collection, rotation, and release

Connections to Other Content Areas:

Math Connection

Observing a formula for energy loss at successive trophic levels of a wetland food pyramid.

Career Connection

Learning about the occupation of “Wetland Ecologist”.