



Wonderful Wetlands

Project Area:
Environmental Science

Skill Level: Intermediate

Learner Outcomes:

Be able to identify wetland characteristics

Be able to identify ecoservices provided by wetlands

TN Science Curriculum Standard GLEs:

S7. The Earth 0707.7.7.6

Success Indicator:

Students understand the ecological services a wetland provides and explain that wetlands are comprised of hydric soils, hydrophilic plants, and water.

Science Skills: Design a model, observe, reflect

Life Skills: Observing, reasoning

Tags: Wetlands, water cycle

Materials

- Sponge
- Pillow (or pillow case)
- Whisk
- House (or photo of a house)
- Bar of Soap
- Colander
- Food Packet
- Bottle of Antacid Tablets

Do you know all the wonderful powers of wetlands?

Wetlands are the kidneys of the earth, soaking up water and pollutants. To have a wetland, you need three things: soil, plants, and water.

Term	Definition
Wetland	A landscape with unique soils, specialized plants, and water.
Hydric Soils	Soil with is permanently or seasonally saturated by water.
Hydrophilic Plants	Plants that have adapted to living in aquatic environments.
Ecological Services	The benefits arising from the functions of a healthy environment.

Introduce Key Concepts:

Introduce the metaphor and allow the students times to interpret it: "Wetlands are the kidneys of the earth." Ask them what do kidneys do in our bodies. Relate the purpose of kidneys to that of wetlands in the landscape; wetlands filter out contaminants and toxins from water. Talk about how wetlands are unique features in the landscape that are created by the combination of hydric soils, hydrophilic plants, and water.

Many insects and amphibians depend on wetlands during various stages of their life, and many reptiles and mammals use wetlands for food and cover.

ACTIVITY, Part 1: Wetland Metaphors

Pass out only the first page of the activity guide (the one that shows the schematic of ecological services in the wetland). Refer to the figure at the bottom that shows all the different ecological services that a wetland may provide. Spread the materials out on a table and ask the students to each choose a metaphor item (or group students in pairs as needed). Explain that each item they hold is a metaphor for an ecological service that a wetland provides. Ask them to think about that service and then go around the group sharing about each metaphor item and the service it represents. Then pass out the remainder of the student guide and have the students answer the matching table below. Ask them if they can think of any additional services wetlands provide to us and to wildlife.



Answer key.

Sponge	Resting place for migrating birds
Pillow	Purifies water of contaminants
Whisk	Removes sediment from water
House	Absorbs runoff and floodwater
Bar of Soap	Provides nourishment for wildlife
Sieve (or colander)	Habitat for wildlife
Food	Mixes nutrients
Antacid tables	Neutralizes acids



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Activity, Part 2: Wetland in a Box!

Create a model with your students to show how wetlands act like sponges to soak up rainwater, filter runoff, and slowly release clean water into streams.

1. Gather materials and start with an empty foil baking pan placed on an incline (using a board on a book or something similar).
2. Place two heaps of gravel at the sides of the box, making two mountain peaks or hills.
3. Place a layer of sand between the two rock heaps, like a river channel. This gravel and sand base will be where most of the water gets captured during the demonstration.
4. Cover the entire box with a mixture of topsoil and clay and compact it down. Fill the pan enough so that the “ground” is below the lip of the pan so that water doesn’t overflow the pan. Ask the students to help compact and smooth out the landscape with their hands. Make sure that water would flow from the peaks to the middle stream and over the lip of the pan
5. Use a watering can with small holes or a spray bottle to “rain” on the landscape. Allow the students to observe cloudy runoff from the mountains into the stream channel. Don’t rain so much that the pan fills with water.
6. Now dig a small trench at the bottom of each mountain (but uphill from the sand in the valley) and place a piece of sponge at the bottom of each mound, between the peak and the valley. These represent the wetlands.
7. Secure sponge tightly against the soil surface with toothpicks. Make sure that the sponge is in tight contact with the soil surface (e.g. so water doesn’t run under it).
8. Optional: Use aluminum foil and other materials (like moss from the yard) to create a unique watershed landscape. The aluminum foil acts like impervious surfaces (like concrete parking lots) and the moss acts like grasslands or prairie fields.
9. “Rain” again on the landscape.
10. Finally, remove the toothpicks and take out the “wetlands” (or sponges), and wring them out onto the white plastic tray. Observe the sediment, or cloudy water, that the wetland sponges had absorbed. Discuss how these wetlands absorbed the sediment and contaminants, protecting the stream from pollution.

Materials

- Foil box with rigid frame
- Gravel, sand, soil
- Trowel
- Large sponge
- Scissors
- Spray bottle or small watering can
- Spoon
- Toothpicks
- Foil

References:

UE Environmental Protection Agency, “The WOW: The Wonder of Wetlands.” <http://www.epa.gov/gmpo/education/>



Step 2. Laying the geology of the watershed.



Step 3 & 4. Creating the river or lake and adding the soil layer.



Steps 6 & 7. Adding wetlands to the watershed.

