

WETLAND WONDERS

(August — October, April, and May)

Wetlands are unique habitats, distinguished by specific plant and animal life, soil types, and drainage patterns. An urban wetland is a gem to explore. Students will put on boots to wade in Murfree Spring, peer through microscopes to see the “unseen world” of pond water, and experience up-close encounters with Discovery Center wetland animals.

3rd GRADE

Standards:

Science

Language Arts

Social Studies

Life Science

Standard 1. CELLS:

Conceptual Strand 1: All living things are made of cells that perform functions necessary for life.
GLE 0307.1.1. Use magnifiers to make observations of specific plant and body parts and describe their functions.

Teacher Questions, Pre-Tour

Q: Using a set of magnifiers (a set of 30 hand tri-lenses can be found online for approx. \$30), have students look at their skin and/or fingernails. They may write a short physical description of the part, then record the function of that part of their body. Using a copy of a 3-4” circle, they may draw what they see through the magnifier lens.

Teacher Questions, Post-Tour

[Suggested preparation: have a table or tray with a number of plant and animal parts available, at least one per student. Animal parts might include different (chicken?) bones (in a zip top bag), feathers, pieces of snake skin, a turtle shell, teeth and/or jawbones, skulls, crawfish claws/exoskeletons, etc. Plant parts may include stems, flowers, seeds, fruits, leaves, and roots.]

Q: Using a set of magnifiers (a set of 30 hand tri-lenses can be found online for approx. \$30) let each student choose a plant or animal body part and examine it with the hand lens. They may write a short (physical) description of the part, then write what they think it does for the plant or animal and why. {Or, using a copy of a 3-4” circle, they may draw what they see through the magnifier lens.}

Note: On the Wetland Wonders tour, students use microscopes to examine plant parts.

Standard 2. INTERDEPENDENCE:

Conceptual Strand 2: All life is interdependent and interacts with the environment.
GLE 0307.2.1. Categorize things as living or non-living.

Teacher Questions, Pre-Tour

Q: Observation: Ask students to divide a sheet of paper vertically down the middle (or fold it lengthwise in the middle). Label one side 'Living' and the other 'Non-living.' Give students 2 minutes to write down as many non-living things as they can see in the classroom, then another minute or so to write in the other column as many living things as they can see in the classroom. (They don't have to list each student by name, simply 'people.')

Compile a master list on the board by making the two columns, 'living' and 'nonliving,' then asking students to read one item from either of their lists, non-living or living, and record on the board until there are no new items suggested.

Q: Are there any items on the 'non-living' list that used to be alive, such as a fossil, a skeleton, bark from a tree, a shell, etc.? [This could be discussed, or students could come up and circle or underline such items, or small groups could make their own lists of 'natural' vs. 'human-made' items from the 'living' and 'nonliving' lists. (Save this list for the post-tour question)]

Ask: What makes something LIVING? How do you know something is NONLIVING, and how do you distinguish between these terms: NATURAL, HUMAN-MADE, LIVING, AND NONLIVING?

Teacher Questions, Post-Tour

Q: After your trip to the Discovery Center, divide another sheet of paper vertically down the middle. Label one side 'Living' and the other 'Non-living.' Give students 2 minutes to write down as many living things as they remember seeing at the Discovery Center. (They don't have to list each student by name, simply 'people.');

again, do the same thing for 'non-living' items they remember seeing at the Discovery Center. Compile another 'master list' where all can see it.

Look at your original lists from the pre-tour questions. Compare the pre- and post-tour master lists.

Q: Are there more or fewer living items listed after your visit to the Discovery Center? More or fewer non-living items? Why do you suppose this is? (If more, possibly a greater diversity of living things, more people, etc. than in a contained classroom; if fewer items are listed, perhaps recall doesn't work as well, or there is a greater familiarity and recall with things they see every day in the classroom.)

GLE 0307.2.2. Explain how organisms with similar needs compete with one another for resources.

Teacher Questions, Pre-Tour

Q: Ask: Do you ever want to buy the same candy bar that another shopper wants? ("Yes" answers).

Q: What do you think would happen if there were more shoppers who wanted candy bars than there were candy bars? (some people wouldn't be able to buy them). This is competition---when more than one person or animal wants the same resource.

Q: What are some ways to reduce 'candy bar competition' so that more people could have candy bars? (limit on purchase, supply more candy bars, have people buy at different times, other)

Teacher Questions, Post-Tour

Q: Can you think of some examples of competition in nature? [For example, many animals eat earthworms (birds, turtles, salamanders, lizards, some snakes) --- and many animals eat mice (hawks, owls, coyotes, foxes, snakes, others). This is one reason earthworms and mice reproduce rapidly and prolifically.]

Q: If competition for the same food makes it hard for one animal to find enough to eat, what are some solutions to this problem? (eating a wider range of food, being a better competitor for the limited supply, changing one's habitat or 'niche' --- Ex: gray squirrels and fox squirrels both live in Tennessee and eat similar foods, but they are active at different times of day, which reduces competition. Gray squirrels are *crepuscular* (active early in the morning and in the evening); fox squirrels are *diurnal* (active during the day).

Standard 3. FLOW OF MATTER AND ENERGY:

Conceptual Strand 3: Matter and energy flow through the biosphere.

GLE 0307.3.1. Describe how animals use food to obtain energy and materials for growth and repair.

Teacher Questions, Pre-Tour

Q: Name something we eat for breakfast. (Cereal, eggs, biscuits, etc.)

Q: Why do we need to eat? (Food provides the energy we need to move about and play or work, and for our cells to help us grow).

Q: Where does our breakfast food come from? (trace each food back to the sun).

Q: Do we make our own food? (No).

Q: What organism CAN make its own food? (Only green plants, with energy from the sun.)

Teacher Questions, Post-Tour

Q: Write the name an animal that you saw at the Discovery Center. How does this animal get the energy to move and grow? (Eats food.) Trace the animal's food back to the sun (Ex: turtle eats fish > smaller fish > algae > the sun). How does your animal stay warm? [Hint: warm-blooded animals, like birds and mammals, get energy from the food they eat and use (metabolize). Cold-blooded animals, like amphibians and reptiles, get energy from the food they eat but have different metabolisms; they use the heat of the sun to warm up.

Standard 4. HEREDITY:

Conceptual Strand 4: Plants and animals reproduce and transmit hereditary information between generations.

GLE 0307.4.1. Identify the different life stages through which plants and animals pass.

Teacher Questions, Pre-Tour

Q: How do plants usually start life? (seeds, some sprout from root or stem pieces). Describe a plant's life cycle. What can determine how long a plant might live? [Suggest students think about different plants before answering this question --- a tree, algae in a pond, a tomato plant, etc.) What happens to plants after they die?

Teacher Questions, Post-Tour

Q: Think of some of the animals you saw at the Discovery Center. How do amphibians start life? What are some stages in the life of a frog or salamander (may need to research this answer). How

do mammals grow? What are some stages in the life of a mammal? (may need to research this answer). Draw or make a model of the life stages of the animal you picked.

GLE 0307.4.2. Recognize common human characteristics that are transmitted from parents to offspring.

Teacher Questions, Pre-Tour:

Q: Sometimes people tell us we look like our Aunt Susie, or our Mom or Dad when they were young. Has that happened to you? (several answers). What characteristics are passed on in families? [hairline (straight or “widow’s peak”), curly vs. straight hair, ability to twist your tongue, attached or unattached ear lobes, color-blindness, hand-clasping (left or right thumb on top), allergies, freckles, handedness (left or right), dimples, cleft-chin].

Teacher Questions, Post-Tour

Q: As we saw at our Discovery Center visit, animals in the center and in the wetland grow and develop into adults that resemble their parents. Compare the characteristics of a human being, of a mammal you saw, and of a reptile you saw. How are they alike? How are they different? (to make this easier, list physical characteristics for each, then list how they get food, water, shelter. Do they give live birth or lay eggs to reproduce?)

Standard 5. BIODIVERSITY AND CHANGE:

Conceptual Strand 5: A rich variety of complex organisms have developed in response to a continually changing environment.

GLE 0307.5.1. Explore the relationship between an organism’s characteristics and its ability to survive in a particular environment.

Teacher Questions, Pre-Tour

Q: What are your own characteristics? (Human, warm-blooded, etc.) How do these characteristics help you to survive in your environment? [How to meet your needs---food, water, shelter, in a suitable arrangement---and avoid danger (think “germs”).]

Teacher Questions, Post-Tour

Q: After our visit to the Discovery Center, pick an animal that you met there, and describe its characteristics, including what it needs to live (food, water, shelter, in a suitable arrangement), to explain how it can survive in its environment. Also, describe the environment!

GLE 0305.5.2. Classify organisms as thriving, threatened, endangered, or extinct.

Q: Define thriving, threatened, endangered, and extinct. (and extirpated!)

Teacher Questions, Post-Tour

Q: Can you give some examples of animals in TN that fit each category? [THRIVING: deer; THREATENED: northern pine snake, western pigmy rattlesnake; ENDANGERED: Carolina northern flying squirrel, peregrine falcon, MANY mussel species, MANY darters (small beautiful

fish), many others; EXTINCT: passenger pigeon, 9 species of mussels; EXTIRPATED: red wolves, gray wolves, Eastern cougar, red-cockaded woodpecker. <http://www.state.tn.us/environment/na/>

Language Arts

Recommended Reading:

Nonfiction:

City Animals (Zoobooks Series) by John Bonnett Wexo.

Ducks, Geese, & Swans (Zoobook Series) by John Bonnett Wexo

Hamsters, Gerbils, Guinea Pigs, Rabbits, Ferrets, Mice, and Rats: How to Choose and Care for a Nocturnal Animals (Zoobooks Series) by John Bonnett Wexo. (Grades 4 and up)

Owls (Zoobooks Series) by Timothy L Biel. (Grades 4 and up)

Salamander Rain: A Lake & Pond Journal by Kristin Joy Pratt-Serafini. (Grades 3 and 4).

Skunks and Their Relatives (Zoobooks) by John Bonnett Wexo. (Grades 4 and up)

Turtles (Zoobooks Series) by Timothy L. Biel. (Grades 4 and up)

Snakes! (Zoobook Series) by John Bonnett Wexo. (2001).

Snakes! Strange and Wonderful. Laurence Pringle. (2009). Elementary.

Fiction:

(Hybrid: fiction and nonfiction) Near One Cattail: Turtles, Logs And Leaping Frogs by Anthony D. Fredericks. (Ages 4 and up)

The Magic School Bus Gets Eaten: A Book About Food Chains by Pat Relf. (ages 4 and up, 32 pages).

Talking Earth, The by Jean Craighead George. (1987), (Ages 8 and up) Lexile Measure: **770L**

For teachers:

Ranger Rick's NatureScope series titles:

Amazing Mammals, Part I (1998, National Wildlife Federation, McGraw-Hill)

Amazing Mammals, Part II (1998, National Wildlife Federation, McGraw-Hill)

Endangered Animals: Wild and Rare (1997, National Wildlife Federation, McGraw-Hill)

Let's Hear It for Herps (1997, National Wildlife Federation, McGraw-Hill)

Wading Into Wetlands (1997, National Wildlife Federation, McGraw-Hill)

Social Studies

Standard 3. GEOGRAPHY:

Content Standard 3.0: Geography enables the students to see, understand and appreciate the web of relationships between people, places, and environments. Students will use the knowledge, skills, and understanding of concepts within the six essential elements of geography: world in spatial

form, places and regions, physical systems, human systems, environment and society, and the issues of geography.

GLE 3.3.02 Recognize the interaction between human and physical systems around the world.

Teacher Questions, Pre-Tour

Q: Where does the water in your house come from? (the city? The county? A well?) Where do you think the water in a wetland comes from? Why is clean water important?

Teacher Questions, Post-Tour

Q: The spring that creates the wetland at the Discovery Center provides water and a home for many plants and animals. Describe the ecosystem of a wetland as a *habitat* and the species that live there in terms of *food chains and food webs* that exist in a wetland. [Hint: This can be done through art, a model, or other learning strategy.]

Standard 6. INDIVIDUALS, GROUPS, and INTERACTIONS:

Content Standard 6.0: Personal development and identity are shaped by factors including culture, groups, and institutions. Central to this development are exploration, identification, and analysis of how individuals and groups work independently and cooperatively.

GLE 3.6.01. Recognize the impact of individual and group decisions on citizens and communities.

Teacher Questions, Pre-Tour

Q: How are changes made at your school? (for example, if you wanted different types of food in the cafeteria?) How are changes made in your city/county? In your country? In the world?

Teacher Questions, Post-Tour

Q: The wetlands and the Discovery Center building and property used to be owned by a bottling company. How do you think the changes were made for this property to be used for a museum and the wetlands preserved so that you could visit with your classmates or families?