Animals & Energy Flow
in the Abbott Marshlands

Grade Level(s): 4-8

Author(s): Tulpehaking Nature Center

Course(s) and School(s)/School District: Abbott Marshlands

Overview/Summary:

Review the definition of a marsh and a lake, as well as energy flow through the food chain. The evidence for determining the presence of various types of organisms is discussed. On the field trip students record the evidence and the location of organisms. Research includes identification of organisms and food relationships. The students construct food chains and a food web. They classify organisms as predator and prey.

Standards/CPIs and 21st Century Themes:

Science: Ecosystems, Interactions, Energy and Dynamics
5-LS2-1   Develop a model to describe the movement of matter among plants, animals and the environment.
MS-LS2-1 Analyze and Interpret data to provide evidence for the effects of resource availability on organisms and populations in an ecosystem.
MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
MS-LS2-3 Develop a model to describe cycling of matter and the flow of energy among living and non-living parts of an ecosystem.
MS-LS2-4 Construct an argument, supported by empirical evidence, that changes to physical or biological components of an ecosystem affect populations.

Interdisciplinary Connections and Technology Integration:

- Identify different environments located within the Abbott Marshlands.
- Character Education: How organisms are interdependent.
- Internet research skills to find additional information for organism report.

Essential Questions:

- In what ways do organisms interact within an ecosystem?
- How is energy transferred in living systems?

TULPEHAKING
nature center
at the Abbott Marshlands

Enduring Understandings:

- All animals and most plants depend on both other organisms and their environment for their basic needs.
- All organisms transfer matter and convert energy from one form to another.

Student Learning Outcomes:

Students will ...
- Construct a food web model that identifies the sun as the ultimate source of energy.
- Differentiate between producers and consumers.
- Identify different types of predators and their prey.
- Construct a model of a food web that shows the interaction of organisms with each other and the environment.

Teaching and Learning Activities (Including Differentiation Strategies) with Timeline:

The Abbott Marshland is a preserve of diverse habitats in the middle of an urban landscape. In this series of lessons, students will explore the area surrounding Spring Lake and a portion of the marsh. Using direct observation and animal signs they will determine the kinds of animals that inhabit the marsh and use evidence to deduce interactions within the natural area.

Lesson 1 PRETRIP

1. Background. In the late 1800s the pond, called Spring Lake, was created by building dikes to impound the water. White City Amusement Park was established around the lake and operated until the 1930s. Beaver have created new impoundments of water with their dams in the marsh beginning in 1992.
2. Review the differences between a pond or lake and a marsh.
3. What kinds of animals would you expect to see in a marsh (in this area)? Include or expand the list to include birds, insects, reptiles and amphibians. What kinds of plants might grow in the lake, at the edge of the lake, and in the marsh?
4. Review how energy passes along the food chain.
5. When visiting the lake and the marsh, what would be evidence of the animals that live there and of interactions indicating the food chain? *Direct observation of animals include: sounds (bull frog call), homes (nests, holes, lodges), tunnels, paths, scat (poop), tooth marks, shed skins (snake, dragonflies), feathers, shells.*
6. Divide the class into groups. Groups might include Mammals, Birds, Reptiles, Amphibians, Invertebrates, and Plants. Students in each group will choose several examples of common animals or plants in the area and research how to identify them. For example, Amphibian group can determine what is the difference between a bullfrog, a pickerel frog, and a green frog? Groups may want to load pictures or calls on a digital device. Explain that on the field trip they will be identifying the animals and recording their location on a map. See the addendum list of common plants and animals.
7. Review the map and data tables students will be using on the Field Trip. One or two

TULPEHAKING
nature center
at the Abbott Marshlands

students could be assigned to photograph evidence of animals and pictures of the plants seen on the field trip.

Lesson 2- Gathering Data at the Marsh
1. Brief introduction by the Tulpehaking Nature Center staff.
2. Guided exploration of the lake and marsh area by the nature center staff. Student in the plant group will record and map the location of the various kinds of plants. Each group records evidence of their animals on the map and data table.

Lesson 3- Discussion and Report
1. Discussion. How do the lake and the marsh vegetation differ?
2. Groups share the evidence and locations of the kinds of animals seen on the trip. Which area seemed to have the greatest diversity of animals?
3. Students do research on what eats the various plants and what the various animals eat. They should then put together at least 3 food chains using plants and animals found in the marsh. They may need to include some animals not seen on the trip. For instance midge and mosquito larvae feed on algae and plant cells in the water and are eaten by dragonflies, damselflies, and swallows.
4. Now combine the food chains from the various groups into a food web incorporating as many organisms as possible.
5. Interactions. Which animals are predators? Which are prey? Which are both?
6. How do the beaver change the habitats of the marsh?

Supplies and/or Equipment Needed:

For the class:
• access to computers for research
• list of common plants and animals

For each student:
• clip board
• data table
• map of the lake and part of the marsh
• pencil

Pre-Assessment and Assessment Strategies (Formative and Summative), Activities, and Rubrics:

1. Each student will prepare a short report on the evidence of the organisms inhabiting the lake, marsh, and surrounding area. Part of the report should include a comparison of the numbers and diversity of the organisms in and around the lake compared to those in and around the marsh.

2. Each group will report create two food chains from the list of organisms in #1 above. These should include the kinds of plants, the kinds of organisms that eat those plants, and the classification of predator and/or prey for each of the animals.

3. The groups will then combine the food chains into a food web using the class data.

TULPEHAKING
nature center
at the Abbott Marshlands

			Rubric			
4	3	2	1
Student correctly identifies and explains 4 or more signs or evidence of animals.	Student correctly identifies and explains 3 or more signs or evidence of animals.	Student correctly identifies and explains 2 or more signs or evidence of animals.	Student is unable to identify or describe more than one sign as evidence of an animal presence.
Student can correctly create 4 food chains from the class data (include plants).	Student can correctly create 3 food chains from the class data (include plants).	Student can correctly create 2 food chains from the class data (include plants).	Student is unable to correctly create more than one food chain from the class data.
Using a food web, student can classify 4 marsh and lake organisms as predator, prey or both.	Using a food web, student can classify 3 marsh and lake organisms as predator, prey or both.	Using a food web, student can classify 2 marsh and lake organisms as predator, prey or both.	Student is unable to classify more than one organism as predator or prey

Student and Teacher Reflection:

Analysis of student performance and learning (both group and individual).

What were the results of the assessments?

To what degree did the results match the expectations for student learning and performance?

What worked well, what didn't work as well as anticipated?

What, if any, modifications should be made for the next time this unit is taught?

What needs to be done now to help the students who have not yet mastered the objectives and to extend the learning of those that have?

What have we learned that will improve our own planning and classroom practice in the future?