

Ecosystem Food Web Mural

Summative Activity for Ecosystem Diversity

Overview

Students will research and present information on organisms found in a specific aquatic habitat and then combine their information to create a food web mural.

Lesson Planner

Use the table below for lesson planning purposes.

Time Required	Research: 45 minutes minimum; This can be expanded as desired Presentation: 30-45 minutes
Key Concepts/Terms	Biodiversity, Energy Cycle, Food Webs, Adaptations, Niche
Prerequisites	Understanding of the key concepts, above
Setting	Indoors, Whole Class/Small Group

Learning Objectives

After completing this activity, students will be able to...

- Research and present information regarding an organism's adaptations, life cycle, and niche;
- Identify connections between an organism and others in the ecosystem, including food web, energy cycle, and predator/prey relationships; and
- Define and explain the role of producers, consumers, and decomposers in a food web.

Materials Required

The following materials are required to complete this activity.

- Paper
- Scissors
- Crayons, Marker, Colored Pencils
- Stapler/Glue
- Lined Index Cards
- String
- Resource Materials, Library, or Internet Access
- Blank Habitat Drawn on Poster or Banner Sized Paper

How to Use This Activity

In this activity, students demonstrate understanding of adaptations, biodiversity, the Energy Cycle, Food Webs and the effects of human activities on ecosystem health.

This activity is written using a freshwater marsh as the chosen ecosystem, but it can be adapted to any other habitat chosen.



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Ecosystem Food Web Mural, Continued

Procedure

Phase	Step	Action
Engage	1	<p>Assign or have each student select a plant or animal from the attached list of marsh organisms (or a list you have created).</p> <p>Explain that they will be researching and presenting their research to the class, as well as combining their work to create a class project.</p> <p>Note: Make sure your mural has enough producers and decomposers to create a good food web later. If students did not select to research enough of these, add them in to the mural as students are researching.</p>
	2	Distribute the <i>Student Sheet -- Ecosystem Food Web Mural</i> , pg. 6, plain paper, and index cards. Review the instructions on the <i>Student Sheet</i> so that students understand their task.
Explore	3	<p><u>Research</u></p> <p>Students research their organism, create an illustration, and compile the information for their presentation.</p>
Explain	4	<p><u>Presentations</u></p> <p>Each student gives a brief oral report to the class about their organism and attaches their drawing and index card to the mural IN ITS APPROPRIATE LOCATION.</p>
	5	<p>After all organisms are placed on the mural, ask if students can tell what major organism is missing: HUMAN.</p> <p>Place a picture of a human (that you have completed before the activity) in an appropriate place on the diagram.</p>

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Ecosystem Food Web Mural, Continued

Procedure (continued)

Phase	Step	Action
Explain		<u>Making Connections</u>
	6	<p>Once students have given presentations and all organisms are placed appropriately on the mural, discuss that the energy in a food web starts with the sun. Using one color of string, start it at the sun and have students choose one PRODUCER from the mural that might start a food web.</p> <p>The student who researched the chosen organism should come up to the mural and, using the string, connect their organism to another in the mural that would be its predator, showing the transfer of energy to that organism.</p> <p>The student who researched the second chosen organism (the one to which the first student connected the string) should return to the mural and make a connection with another organism that is its predator, and so on, until the food chain ends with a decomposer.</p>
	7	A new food chain should be started, again with the sun, but this time use a different colored string. Repeat Step Six for the new string. This should continue until you have many different food chains overlapping and forming a multi-colored web.
Elaborate	8	Have students answer some or all of the questions in Part E of the <i>Student Sheets</i> to elaborate on the concepts of adaptations, niche, and biodiversity.
Evaluate	9	Use the attached rubric to evaluate student performance.

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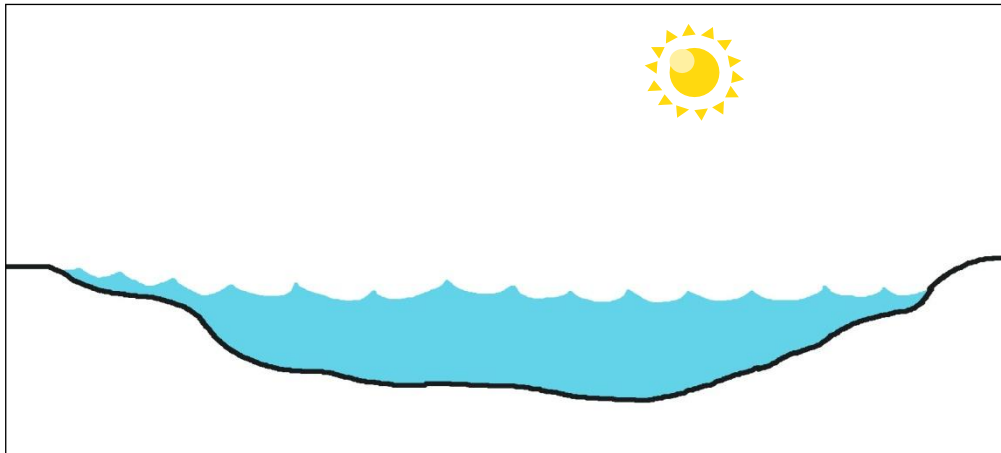
Ecosystem Food Web Mural, Continued

Fresh Water
Marsh
Organism List

Be sure to assign a variety of organisms to get a complete web. The list below gives some possible choices.

Mosquito & Larvae	White Perch	Belted Kingfisher
Isopod	Mummichog	Osprey
Crayfish	Eastern Mudminnow	Green Frog & Tadpole
Whirligig Beetle	American Eel	Northern Water Snake
Water Strider	Gizzard Shad	Painted Turtle
Dragonfly & Nymph	Inland Silverside	Beaver
Bluegill	Banded Killifish	Raccoon
Catfish	Great Blue Heron	White-Tailed Deer
Mosquitofish	Red-Winged Blackbird	Muskrat
Bald Eagle	Snail	Algae
Mallard	Clam	Eel Grass
Water Boatman	Mussel	Coontail
Damselfly & Nymph	Copepod	Hydrilla
Predaceous Diving Beetle	Scud	Wild Rice
Marsh Mallow (Hibiscus)	Spatterdock Lily	Duckweed
Tearthumb	Pickerelweed	Bacteria
Cattail	Arrow Arum	Leech
Fungi	Turkey Vulture	

Sample Blank
Mural

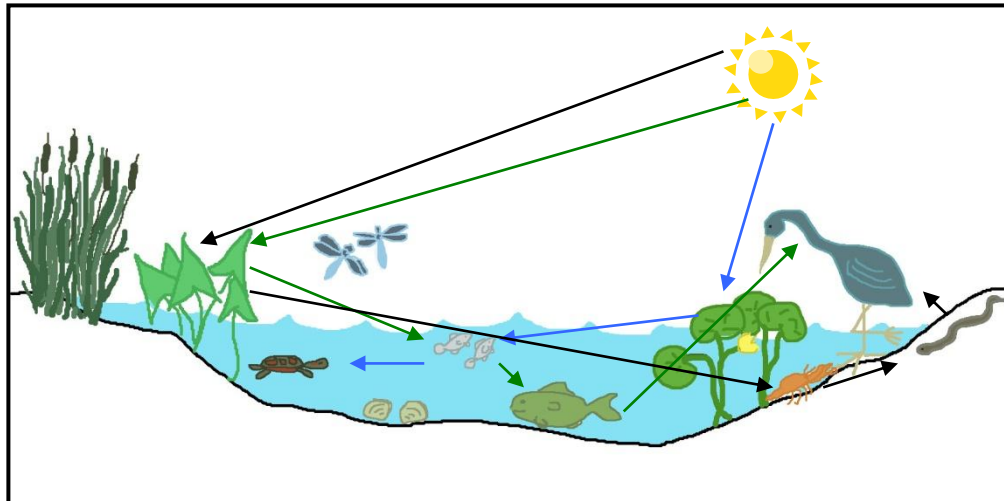


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Ecosystem Food Web Mural, Continued

Sample
Completed
Mural



Vocabulary

Understanding of the following terms is useful in this activity.

Term	Definition
Biodiversity	the variety, distribution and abundance of living things and ecological processes in an ecosystem
Consumer	an organism that obtains food by eating plants and other animals
Decomposer	eat dead and decaying organisms, recycling the nutrients to be used by a new generation of plants (include insects, worms, bacteria and fungi)
Ecosystem	the system of living organisms, their physical environment, and all their interactions and relationships. Ecosystem can also be used to describe the area where these interactions occur (ex. pond or forest ecosystem)
Food Chain	the sequence of transfers of food energy from one organism to another. Producer – Consumer – Decomposer (hierarchy of “who eats what”)
Food Web	complex and interlocking food chains
Habitat	a place that has the minimum required amounts of food, water, shelter and space for a particular species
Niche	the role of an organism in its natural environment – what it eats, where it lives, what it does, etc. Think of niche like a job description of an organism. The niche determines how it relates to other organisms. This ensures its survival, because it has different needs than other organisms.
Predator	an animal that obtains food mainly by killing and consuming other animals
Prey	an animal taken by a predator as food
Producer	any organism (such as a green plant) that <u>produces</u> its own food; many producers are food sources for other organisms

References

This activity was adapted from “Estuary Food Chain Mural,” [Hands On! Feet Wet!](#) Echo Hill Outdoor School, Blooming Neck Road, Worton, MD 21678

Student Sheet – Ecosystem Food Web Mural

Objectives

You need to show your teacher how much you understand about adaptations, biodiversity, the energy cycle and niches.

You will:

1. Research an organism in a marsh ecosystem.
 2. Place your drawing of your organism in a mural of the ecosystem.
 3. Tell your class about your organism.
 4. Connect your organism to others in a food chain/food web.
 5. Explain how your organism connects to others in the food web.
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Part A. Research

You are going to learn about a specific organism. The instructions for your drawing an information card are listed below. Both of these will be put up on the mural to teach others about your organism.

Drawing

On the sheet of blank paper, draw a realistic picture of your organism.

Information Card

On your index card, write the following information:

- A. **HABITAT** – Where in the ecosystem does it live? (deep or shallow water, trees, edge of the marsh, etc.)
- B. **SIZE** -- Average size of the adult organism.
- C. **FOOD** -- What the organism eats (how it obtains energy and nutrients).
- D. **PREDATORS** -- What eats the organism?
- E. **REPRODUCTION:** Location and means of reproduction.
- F. **ADAPTATION** – Tell about one adaptation for the organism. Make sure you tell how this adaptation helps it survive in the habitat.
- G. **ROLE IN THE FOOD CHAIN:** Is your organism a **producer, consumer or decomposer**? Explain why it is this role.
- H. **CLASSIFICATION** of the organism by type (for example, a snake is a **reptile**; coontail is an **aquatic plant**, etc.).



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Student Sheet - Ecosystem Food Web Mural, Continued

Part B. Present Your Research

You will tell your classmates about your organism. You need to...

- Show them what your organism looks like;
 - Explain the information on your index card; and
 - Put your picture of the organism in a **CORRECT PLACE** on the mural (somewhere it would really be found).
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Part C. Making Food Web Connections

You and your classmates will connect all of the organisms on the mural into food chains. These connections show how living things get energy to live.

When your organism is selected, go to the mural and connect it to another organism that eats it. You will connect them using string. The string shows energy moving from your organism into the one that eats it.

Part D. Your Organism and the Energy Cycle

In the space below draw a food chain that includes your organism. Make sure you...

- Show how energy is transferred through the food chain, and
- Label producers, consumers, and decomposers.



Ecosystem Food Web Mural Scoring Rubric

How You Will
Be Graded

Your grade will be based on the criteria in the table below. Next to each criteria are four columns:

- How many points each topic is worth;
- your score of your own work;
- how another student (peer) scores your work; and
- the teacher's score of your work.

Grading Criteria	Assessment			
	Possible Points	Self	Peer	Teacher
DIAGRAM is complete and shows clearly what the organism looks like				
HABITAT is correctly explained on information card				
SIZE: Correct size is on information card				
FOOD: Correctly explained what the organism eats/how it gets energy				
PREDATORS: Correctly explained what eats the organism				
REPRODUCTION: Correctly explained how and where the organism reproduces				
CLASSIFICATION: Correctly identified the KIND of organism				
PRESENTATION: Clearly communicated all information to the class				
MURAL PLACEMENT: Put organism drawing in a place that shows where the organism lives in the habitat.				
FOOD CHAIN CONNECTION: Correctly connected the organism to something that eats it in the mural				
PART D: Drew a complete food chain that includes their organism.				
PART E: Correctly Answered Questions in Part E of the Student Sheet				
TOTAL SCORE				

Ecosystem Diversity Teacher Resources

Overview

This section provides resources for information regarding Ecosystem Diversity.

Websites

Learn some creative ways to integrate the Chesapeake Bay and environmental issues into your classroom lessons. Search through the **Bay Backpack's** books, multimedia, curriculum guides, individual lesson plans and online data sources about the subjects you are teaching in class. www.baybackpack.com



The **Alice Ferguson Foundation Kids' Zone website** contains interactive online activities and classroom lesson plans on a variety of environmental science topics. Suggested activities for ecosystem diversity include: *Classified Information, Let's Take a Dip, Plant Identification, and Macroinvertebrate ID*. www.fergusonfoundation.org

Project Budburst is a citizen scientist web site to collect data on the first blooming of common plants. Web site includes many educational resources and project ideas for K-12. www.budburst.ucar.edu

Growing Native is a year-round volunteer project that collects hardwood seeds and plants trees to help restore and protect rivers and streams in the Potomac River watershed. www.growingnative.org

Maryland Department of Natural Resources, member of the Maryland Children in Nature Coalition has a web site with kid-friendly outdoor activities. dnr.maryland.gov/cin/forkids.asp

Guess Who's Squawkin' is an interactive site for kids to identify common bird calls: www.audubon.org/educate/kids/squawkin.html