EXPLORE

10 | Tangled Web

GRADE LEVEL

4-8

45 minutes

summary

Students make a yarn web of connections between Great Lakes species, discuss the significance of the complexity of the web and discover the impacts of changes to the web.

objectives

- List five to eight connections between Great Lakes organisms in a food web.
- Explain the impacts of changes in a Great Lakes food web.
- Diagram a small food web.

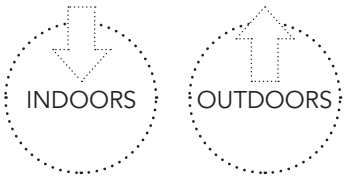
prerequisite

Lake Connection, Eco-Language, Fish Observation, A Closer Look

vocabulary

Food web: the whole group of interacting food chains in a living community

setting



subjects

Ecology, Environmental Science

standards

This Great Lakes in My World activity is aligned to the Common Core State Standards and to state learning standards in:

Illinois
Indiana
Michigan
Minnesota
New York
Ohio
Pennsylvania
Wisconsin

This alignment is available on your Great Lakes in My World CD in the "Standards" folder and on-line at http://www.greatlakes.org/GLiMWstandards.

resources

Food Web sites:

Environmental Protection Agency
www.epa.gov/glnpo/atlas/images/big05.gif

Michigan Sea Grant
http://www.glwi.uwm.edu/ourwaters/documents/FoodWebWeb.pdf

Michigan Tech
www.techalive.mtu.edu/meec/module08/FoodWeb.htm

materials

- Creature Cards with asterisk (*)
- Ball of yarn
- Masking tape

background

Food chains that show feeding relationships in an ecosystem are part of large and complex food webs. By exploring these relationships, students become familiar with the concept of food webs, as well as the different plants and animals that inhabit the Great Lakes. Information on eating habits can be found on the backs of the Creature Cards.

procedure

1. Have students brainstorm a list of species in the lake. Use the Creature Cards to help guide their responses. Give each student one Creature Card. Using those from the aquatic ecosystem will work best (with asterisks). *Include organisms students have learned about in the two previous activities.*
2. Have students hold the cards or attach them to their shirts with masking tape so that everyone can see the pictures. Have students sit in a circle and announce the names of their organisms.
3. Holding the ball of yarn, tell students that you represent the sun. You will give your energy to one of the plants, e.g., algae, by holding onto the end of the yarn and passing the ball to a student with a plant card. When a student receives the ball of yarn, she or he should hold onto one end, and pass the ball to a student with the card of an organism that his/her organism could eat OR be eaten by. For example, the algae could pass the yarn to a zooplankton, who could pass it to a forage fish or vice versa. Students should look at the backs of their Creature Cards to determine what the organism eats or is eaten by. Continue passing the yarn until it has reached everyone at least once. Continue the game as long as you can find new connections. Since each student is holding onto a piece of the yarn, a web should be forming between the students.
4. It is very important that each time the yarn is passed, students realize that it can go to the organism that eats their creature OR to an organism their species eats. Otherwise, a food web will not be created. Some creatures may be included more than once. Make sure all creatures become part of the web. This may involve some problem-solving.
5. At this point, give a hypothetical situation (positive or negative) that affects a species. For example, if the lake trout have been over-fished, have the "lake trout" give a light tug on his/her piece of the yarn. Have students "tug back" when they feel the tug, raising their hands as they tug for a visual of the web interconnections. For each species, at least two others will feel a tug on the yarn and eventually everyone will. You can also have the "lake trout" drop the yarn and have the rest of the class readjust the web to account for the change. Other scenarios could include: (+) a comeback in the yellow perch population, wetland habitat restoration, or (-) a wetland is filled, impacting species who spawn in the wetland; mercury has entered the lake, causing aquatic birds to die; or zebra mussels have entered the food web, reducing the amount of food available for native fish.
6. Discuss:
   - What did the yarn look like after it had been passed to everyone? *A web.*
   - Why did it look like this instead of a straight line or circle? *The food web connections are complex, like a web.*
   - What happened when one organism dropped the yarn? Did the web stay the same, fall apart completely, or something else? *The rest of the web had to readjust. Other organisms were impacted, but the whole web did not collapse because it is complex enough that it can change and still survive.*
7. What would happen if more and more scenarios were introduced, eliminating more parts of the food web? *The food web would ultimately look a lot different from the way it looked originally, and would be more simplified. Food webs that lack complexity are not as resilient to change as those with a diverse group of organisms.*

Satisfy Your Curiosity QUESTION IDEAS

- *Where does my species fit into the food web?*
- *What eats my species?*
- *What does my species eat?*
- *What other organisms does my species impact?*

wrap-up

Use the journal pages for the following:

1. Food Web Diagram: Have each student create a food web diagram that includes five to eight organisms. The food web should include several food chains. Use arrows to indicate who eats who, and include all types (decomposers, producers, herbivores, omnivores, carnivores, scavengers). Students may need to ask questions of others who had different Creature Cards.
2. Have each student write a brief essay that articulates how his/her organism fits into the food web. In the essay, the student should explain the effect of changes in the food web, and begin to draw conclusions about what happens to a food web when species are eliminated.

assessment

Rubric on page 86

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journal pages

FIRST NAME																				
LAST NAME																				

[1] Draw a picture of a lake food web. Include 5-8 species in your picture, and arrows to show how they are connected.

[2] Write about how your organism fits into the food web. Explain the impact changes have on the food web. Draw conclusions about what happens to a food web when species are reduced or increased.

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