

Laboratory

Investigation

Analyzing Feeding Relationships Among Organisms

Within a community, organisms interact in many ways. Tracing the flow of energy within a community can help you understand how the organisms interact. In this investigation, you will construct and compare food webs for two different communities.

Problem

How does the energy flow through a community affect the community's complexity and stability?

Analyze the feeding relationships among the organisms from two terrestrial communities.

Materials (per group)

- ▶ 2 large sheets of unlined paper
- ▶ plain notebook paper
- ▶ pen or pencil
- ▶ several colored markers
- ▶ transparent tape or glue

Procedure

1. On the next page, you will find a chart that contains two lists of organisms. One list includes organisms from a hickory/oak forest community in a temperate deciduous forest. The other list is from a cultivated cornfield community.
2. Carefully read the lists and identify as many feeding relationships as you can. In many cases, one species may be linked to several others—either as a food or as a feeder.
3. Write the names of the organisms from the first community on a sheet of notebook paper. Cut the names out and place them on one of the large sheets of paper. *Note:* Do not attach them to the sheet yet.
4. Discuss with your partner how the organisms should be arranged. Keep in mind that the names have to be connected to one another to indicate feeding links.
5. When you have decided on the arrangement, attach the names of the organisms to the large sheet with tape or glue.

Organisms in Deciduous Forest and Cornfield Communities

Organisms	Hickory/Oak Forest Community	Cultivated Cornfield Community
Plant species	White oak, black oak, tulip tree, white pine, birch, big tooth aspen, dogwood, sassafras, viburnum	Corn
Animal species	Invertebrates, such as beetle, ant, sow bug, earthworm, snail, termite, moth, centipede, and spider; birds, such as cardinal, warbler, chickadee, woodpecker, flycatcher, and owl; other animals, such as raccoon, squirrel, chipmunk, black bear, opossum, wood mouse, vole, deer, and black racer (snake)	Raccoon, corn snake, woodchuck, field mouse, deer; invertebrates, such as corn borer, grasshopper, cricket, earthworm, butterfly, moth, and fly; birds, such as sparrow, meadowlark, crow, and hawk
Fungi and bacteria	Various fungi and bacteria	Various fungi and bacteria

6. Use the markers to construct food chains by drawing arrows from the food source to the feeder. Use different-colored markers to indicate different food chains. Make your food web as complex as possible.

7. Repeat steps 3 through 6 for the second list of organisms.

3. Which community has the greater variety of primary producers? The greater number of trophic levels?

4. Suppose a parasite destroyed most of the oak trees in the forest community and the corn plants in the cultivated field. How would each community be affected?

Observations

1. Compare your webs to those created by other groups.
2. Which community—the hickory/oak forest or the cornfield—is more complex?

Extensions

Choose one animal species from each of the two communities and assume that it has become extinct. Predict the effect the loss of each animal would have on its community. Which community will be less affected by the loss? Why?

Analysis and Conclusions

1. Are the food webs for the hickory/oak forest community the same for different groups? If not, how are they different?
2. Are the food webs for the cornfield community the same for different groups? If not, how are they different?