

Food web

National Science Content Standards

Evidence, models and explanation; interdependence of organisms; matter, energy, and organization in living systems

TEKS Concepts – Biology 9D and 12E

Analyze the flow of matter and energy through different trophic levels and between organisms and the physical environment

Interdependence and interactions within an ecosystem - investigate and explain the interactions in an ecosystem including food chains, food webs, and food pyramids

Objectives

Students will. . .

1. Explain the role of the mosquito in the food chain.
2. Describe the role of mosquitoes as pollinators.
3. Graph results of the background information contained in the Habitat Surveys.

Materials

Food web cards, one per student [Appendix G]
One set of web cards per 3-4 students
Tape - masking tape or clear tape
Yarn
Graph paper

Duration

One 45-minute class period

Vocabulary

Carnivore
Consumer
Food web
Heterotrophic
Insectivorous
Pollinator
Primary
Secondary
Tertiary

Teacher Preparation

Note: This lesson requires that students have some basic pre-knowledge about food webs.

1. Copy web cards and cut apart. You will need one card per student, plus one set of cards for each student group.

Background

Food Chain

1. Mosquitoes are heterotrophic
2. Primary consumer – both males and females eat nectar
3. Secondary consumer – females only - females feed on any animal that has blood (necessary for the production of eggs)
 - a. Different species have different preferences
4. Eaten by – birds, reptiles, bats, fish, and amphibians!
5. Some mosquitoes are carnivores and will eat other mosquitoes.
6. In a food chain, other organisms may be tertiary consumers, producers, or detritivores.

Pollinators – Male mosquitoes feed on nectar, transferring pollen from one plant to another as they feed.

What to Do

1. As students enter classroom, tape one of the food web cards on each back, without letting the owner see what is on their card.
 - a. Each student is to determine 1) what organism is on their card and 2) what that organism's role is in the food chain
 - b. They may only ask other students questions that can be answered by yes, or no.
 - c. They may ask one student no more than two questions, then must go to another student. They must ask questions of at least six other students before they can go back to an earlier student a second time.
 - d. When a student correctly guesses the organism and role on his card, s/he may move the card to his front.
2. After everyone has guessed their organism, place students in groups of 3 or 4. They should demonstrate the interrelations of a food web by arranging their set of web cards into a food web, using yarn to connect the "eater" with the "eaten."
 - a. Ask each group questions to assess understanding, such as
 - i. Which direction does the energy flow?
 - ii. Why did you arrange the cards in this way?
 - iii. What happens in a community if any organism is removed from the web? (Such as through famine, illness, or pesticides.) To demonstrate, have them remove an organism with its attached yarn. Which other organisms are impacted?
3. Discussion
 - a. What is similar about the webs each group organized? What is different? Are these differences valid? Why, or why not?
 - b. Are male mosquitoes secondary consumers? Why, or why not?
 - c. Are female mosquitoes primary consumers? Why, or why not?
 - d. What would happen in a community if all the mosquitoes were killed? Would that be good or bad? Why?

4. Graphing of Habitat Surveys

This can be done as a class, or each student group can make their own graph and then compare with others in the class. (Bar graph - number of places/containers found x types of containers.) Ask the students:

- a. What type of "container" is the most plentiful?
- b. What types of containers can be emptied or removed most easily?
- c. Why is this important in controlling mosquitoes?

Food web cards

EARTHWORMS	THE SUN
ALGAE	GRASS
FLOWER	TREE
MALE MOSQUITO	FEMALE MOSQUITO

MOUSE	GRASSHOPPER
MOSQUITO LARVAE	INSECTIVOROUS BIRD
BAT	INSECTIVOROUS FISH
FROG	OWL

BASS (A CARNIVOROUS FISH)	SNAKE
BACTERIA	MUSHROOMS