

Weave a California Oak Woodland Web

Grade 4-6

Supplies

- Ecosystem description sheets
- Set of laminated Food Web Cards
- Balls of yarn of several bright colors
- Large sheets of paper for Food Web Map
- Crayons or colored pencils

Background information

Green plants and some single-celled organisms possess chlorophyll, which enables them to make sugar through Photosynthesis. All living things depend on sugars and sugar by-products to live and carry on their normal functions of growth and reproduction. This means that all living things depend on plants to survive. In any given ecosystem there are many complex relationships between living things and their environment. Plants that create their own food energy through photosynthesis are called Primary Producers. They produce the sugars that other living things use for food.

Animals that rely on the sugars produced by green plants are called Consumers. There are two main types of consumers:

- Herbivores (Primary Consumers) such as deer and mice, which obtain their food energy by eating plants
- Carnivores (Secondary Consumers) Such as mountain lions and hawks, which obtain their food energy from eating other animals

Omnivores like coyotes eat both plants and animals. There are also decomposers (bacteria, fungi, and other microscopic organisms) that break down dead plant and animal matter and wastes. The interrelationships between all of the producers, consumers, and decomposers of an ecosystem form a complex and delicately balanced food web.

Oak Woodland Food Web

Shuffle the oak woodland food web cards and pass them out to each student. Each card has the name and a picture of an animal, plant, or other organism that exists within the California Oak woodland. Ask students to 'become' their animal and read the card for a brief summary about the habits and food requirements of his/her organism.

As the teacher, you are the sun. The sun will hold the ball of yarn and hand the end to a plant (grass); the grass will then hand the end to a primary consumer (deer) and the deer will hand off the string to a secondary consumer (mountain lion). A ball of yarn of another color originating from the sun will be used to track another food chain. As some animals eat various types of prey species, and decomposers will eventually break down all organisms, yarns of different colors will begin to cross, and the food web will become more and more complex.

Ask your students to predict where the ball of yarn might go next, and have them dictate the patterns created.

Hints for discussion after the food web has been constructed

- If the area was sprayed with insecticide, how would that effect?
- What would happen if a disease killed all the mice in this area?
- How might our landscape change if the oak trees were removed?

Have students write a journal entry or discuss in small groups some of the ways we can prevent the collapse of these complex ecosystems. Consider having the class make a food web map on a large sheet of paper that illustrates the complexity of the Oak Woodland Food Web. This can be done by gluing the game cards onto the paper after they've been colored. They can be connected by lengths of colored yarn or by colored lines drawn with a ruler.

At the Santa Barbara Botanic Garden

Explore the Garden searching for clues about animal/plant relationships. Do you see any acorn woodpeckers? What about one of their granary trees? Are there any oak galls? Bring a paper bag if you'd like to collect things that you might find – please pick from the ground, not from living plants!

After your visit

If your students are grasping the subject, consider exploring what happens when you increase populations instead of just removing them. For example, if the mountain lion population goes down, the deer population goes up. If the deer population goes up, the grasslands are overeaten. If native grasses are eaten before they can go to seed invasive species have the opportunity to move in. Many invasive species do not support key native pollinators and some cannot be consumed by herbivores, can increase fire risk, and harbors unwanted pests (e.g. pampas grass)

Other Curriculum

See **Leaf Litter** for information on the importance of leaf litter (including that provided by oak trees) to healthy ecosystems.

See **Amazing Acorns** for more information on how the Chumash used acorns as a food source.

See **Oaks in the Garden** for more information on observations to make at the Garden.

See **Soil Experiment** to see how you can see the process of decomposition in your classroom over the course of one school year.

See **Who Depends on Oak Trees** for another activity on food webs.