

**National Science
Education Standards**

- * Standard C: *Life Sciences* — Structure and function in living systems.
- * Standard C: *Life Sciences*— Populations and ecosystems.
- * Standard C: *Life Sciences* — Diversity and adaptations of organisms.



What's For Dinner?

OVERVIEW

Student groups brainstorm and create the longest consumer-consumed food chain possible using either magazine pictures or research materials.

OBJECTIVES

Students will:

1. Identify consumer–consumed relationships.
2. Construct their own food relationships and construct their own food chain using only those interactions.

SUBJECTS

Science

VOCABULARY

Predator, prey, consumer, consumed

TIME

50 minutes

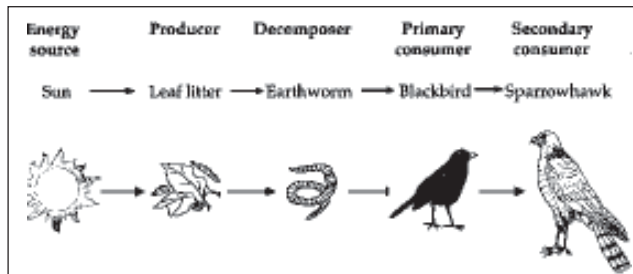
MATERIALS

Wildlife and nature magazines, 5 x 8 index cards, tape, research materials

BACKGROUND

Plants and animals in an ecosystem are linked together by their feeding relationships. The sequence of steps within these feeding relationships is a food chain. As green plants are usually the main source of energy input into an ecosystem, food chains generally begin with a green plant.

For example, in a woodland an oak leaf produces energy-rich sugars and starch through the process of photosynthesis. A caterpillar of a buff-tip moth, in its search for energy (in the form of food), eats the leaf. In turn, the caterpillar is eaten by a blue tit. Thus there is a transfer of energy from leaf to caterpillar to bird, in a food chain:



In food chains, we group organisms according to their feeding level or trophic level:

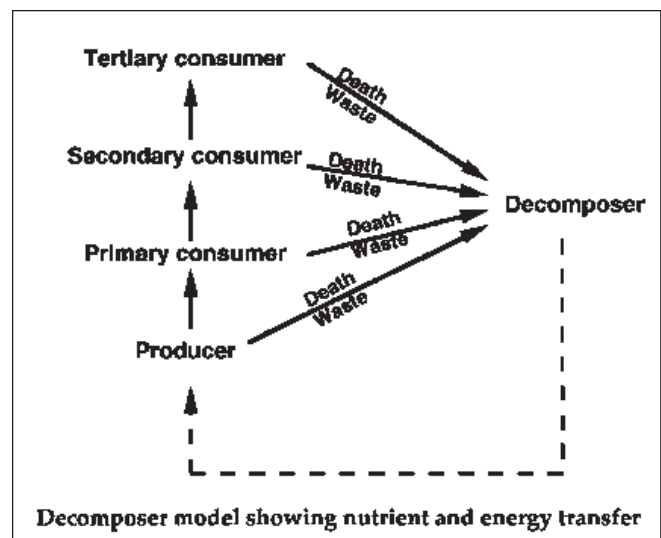
- ❖ green plants are at Feeding Level 1 or Trophic Level 1
- ❖ herbivores (e.g. caterpillars) are at Feeding Level 2 or Trophic Level 2
- ❖ carnivores (e.g. blackbirds which eat herbivores) are at Feeding Level 3 or Trophic Level 3
- ❖ carnivores (e.g. sparrowhawks) which eat other carnivores are at Feeding Level 4 or Trophic Level 4.
- ❖ the leaf litter is the producer
- ❖ the earthworm is the primary consumer or herbivore

- ❖ the blackbird is the secondary consumer or carnivore
- ❖ if a sparrowhawk successfully hunted the blackbird, it would represent a tertiary consumer or top carnivore.

In a food chain diagram, arrows indicate the direction of energy transfer. A common mistake children make when representing food chains is to point the arrows the wrong way, so it is important to emphasize the direction of transfer.

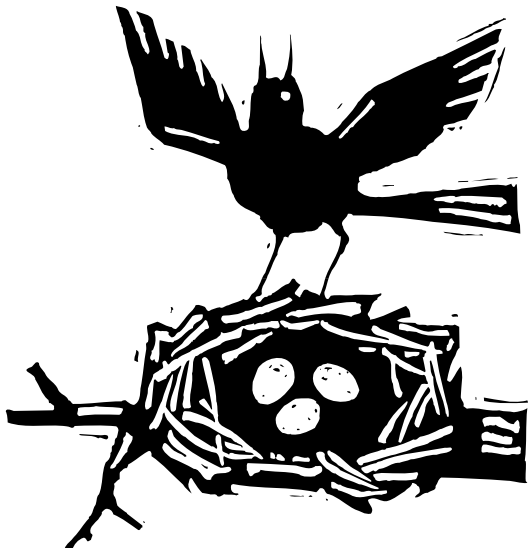
Many producers and consumers die without being eaten, so decomposers such as woodlice and earthworms, which themselves may become prey items, form an important additional link, decomposing the dead bodies and wastes of plants and animals at all trophic levels in the chain. This way, the materials of life are recycled and can be used again and again (i.e. in nutrient cycles).

Food chains show simple relationships between herbivores and carnivores and the predator-prey relationship, but to get a better and more detailed knowledge of ecosystems we need to look at food webs and pyramids.



ACTIVITY

1. Define the terms **predator**, **prey**, **consumer**, and **consumed** with the class. Brainstorm examples of consumer-consumed relationships.
2. Ask each group to make the *longest* possible food chain to illustrate consumer-consumed relationships. *For example, an insect like an aphid consumes plants; the aphid is eaten by a spider; the spider is eaten by a bird; the bird is eaten by a goshawk....*
3. Students cut out or draw pictures of each animal in their chain from magazines and tape one stage of the food chain on each 5 x 8 index card.
4. Connect the cards with tape or string. The students should ask the teacher to verify that each consumer-consumed relationship could exist. If appropriate, students indicate which relationships are predator-prey as they make their chains.
5. Each group presents their completed and verified food chain to the rest of the class. The group with the longest chain of consumption gets a hand from the class!



EXTENSIONS

- A. **Guard against predation.** Brainstorm with students the various ways animals protect themselves from predation. For instance, a bee stings, a skunk squirts a foul smelling liquid, and many animals such as snakes, moths, and lizards use camouflage.
- B. **Sing a food chain.** Read or sing the folk song, "I Know an Old Lady Who Swallowed a Fly." Students replace items eaten in this consumer-consumed chain with Alaskan creatures. Sing the new version of the song in the class. If possible, obtain the Pacific Northwest version of the tale, *I Know an Old Lady Who Swallowed a Trout*, for the students to look at afterward.

ASSESSMENT

1. Students define predator, prey, consumer, and consumed.
2. Students give two examples of consumer - consumed relationships.

CREDIT

This activity is adapted with permission from the Alaska Wildlife Curriculum (AWC). AWC is a program of the Alaska Department of Fish and Game. Go to <http://www.wildlife.alaska.gov/education/wilded/awc.cfm> or <http://www.adfg.state.ak.us/> for more information about this award-winning environmental education curriculum.