



Detecting Schoolyard Food Chains

Objective

- Students will be able to construct food chains that include organisms that live in their schoolyard.

Procedure

1. Review the definition of a food chain and provide simple examples if necessary (see “The ‘Sun’ wick activity”).

2. Ask students what examples of food chains they might expect to find in their backyards. They might list insects eating plants that use the sun to make their food. Even if they do not witness an insect eating a plant or a predator (robin) eating a prey (worm), they can look for evidence of food chains.

3. Tell students that they are going to play “Food Chain Detectives” and look for schoolyard food chains. You might want to embellish the scenario by describing an investigation: The Case of the Missing Links. Be dramatic as you wish as you describe their mission to find proof that food chains are taking place all around them. Ask the class to suggest clues they might look for to prove that food chains exist in their schoolyard (e.g., plants nibbled by insects). Tell students that they can also look at an insect and guess what it might eat.

4. Take the class outside and divide students into pairs. Give each pair a clothes hanger and instruct them to place the hanger on the ground between them (depending on the maturity of your students, you can also have them carefully toss the hanger and go to where it lands to investigate).

5. Tell them to look for any evidence that food chains exist within the parameters of the hanger. Suggest that they find one or more organisms and look for clues that “link” it to other plants or animals in a food chain. They can look for plants that have been eaten or insects that have eaten something. You might want to let students dig to look for organisms

underground. You can also invite students to look in trees and bushes to see what food chain organisms might be lurking there. If students are lucky, they might actually witness a food chain in action (such as sun shining on plants, a spider catching a fly, or a bird eating an insect).

6. Have each pair select one plant or animal to draw in their **Energy Learning Logs**.

7. Return to the classroom and tell students that an important part of detective work is research. Have students find out more about their chosen plant or animal and where it fits within a food chain. They are looking for ways to fill in the “missing links” to complete a food chain. What does the animal eat? What, if anything, eats it? What else does an animal need to survive? Ensure they include water in their investigation. Point out that some insects do not need to drink water directly but they get it from the plants they eat. Discuss how the plants get the water. Depending on their skill level, students can look in reference books to try to identify their plant or animal. You might want to invite a middle or high school biology teacher or a local naturalist to help.

8. Lead students to construct food chains that include their organism, check to see that they include the sun. Students can record findings in their **Energy Learning Logs**. You might want to invite the art teacher to provide suggestions for using different mediums to create and draw the chains (e.g., felt board).

9. Now that the detectives have gathered their information, they need to report their findings to the class. Have they solved the Case of the Missing Links?

Assessment

- Have each pair of students present and describe their food chain to the class. If the class is making an **Energy Flow Mural**, they can post their food chains on the mural.

Summary:

Students research organisms in their schoolyard and create simple food chains involving those organisms.

Grade Levels: (K-2) 3-4

Subject Areas: Language Arts, Life Science, Environmental Literacy & Sustainability

Setting: Outdoor setting with a variety of habitat types

Time:

Preparation: Two 50- minute periods
Activity: One week

Vocabulary: Carnivore, Consumer, Decomposer, Food chain, Food web, Herbivore, Heterotroph, Primary consumer, Producer, Secondary consumer, Solar energy, Sun, Trophic level

Standards Addressed:

CC ELA: L.K.1.A&D, L.K.2.A, L.K.4&6, L.K.5.D, L.1.1.A&G-H, L.1.2.A-B&D-E, L.1.5.B, L.1.6, L.2.1-3, L.2.5.A-B, L.2.6, L.3.1, L.3.2.E-F, L.3.3, L.3.5.B, L.3.6, L.4.1.F, L.4.2.D, L.4.3.A-B, L.4.6, RI.K.1&3&7&10, RI.1.3&6, RI.3.4&7, RL.K.1&10, SL.K.1.A, SL.K.2-6, SL.1.1.A-C, SL.1.2, SL.1.4-5, SL.2.1.A-C, SL.2.2, SL.2.6, SL.3.1.A-B&D, SL.3.6, SL.4.1.A-D, W.K.1-3&7-8, W.1.1&3&7-8, W.2.1&3&7-8, W.3.1.B&D, W.3.7, W.4.1.B-C, W.4.2.E, W.4.3.D&E, W.4.7

NGSS: K-LS1-1, K-ESS3-1
SEP: Analyzing and Interpreting Data, Developing and Using Models, Obtaining, Evaluating, and Communicating Information
DCI: LS1.C: Organization for Matter and Energy Flow in Organisms, ESS3.A: Natural Resources
CCC: Patterns, Systems and System Models

EL&S: Connect: C1.B.e, C1.C.e, C1.C.i
Explore: EX2.A.e, Ex2.A.i, EX2.B.e, EX2.B.i, EX3.B.e, Ex4.A.e, EX4.A.i, EX5.B.e

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Materials:

- A section of the schoolyard or a nearby park that has plants, insects, and other animals
- Clothes hangers (one for each pair of students; stretch out the hanger to make a square)
- **Energy Learning Logs** and writing implements
- Small shovels (optional)
- Tools to explore school yard food chains, such as tweezers, magnifying lenses, paper cups (optional)
- Simple reference or picture books (e.g., insects, birds, plants)
- Drawing paper and crayons



Related KEEP Activities:

The KEEP Activity “Energy from Food” is an ideal follow-up to this activity. Students learn how food is the fuel that our bodies use to move and grow. Encourage students to add humans to their food chains. Available at keepprogram.org.

- Combine all the food chains to connect to a single sun; challenge students to see if they can find interconnections among their various food chains and create a food web.

Extensions

Students might be interested in making a living model of a food chain they found in the schoolyard. Have students bring in a large glass jar and poke holes in the lid. Put some soil and small plants in the soil (if time allows, students can try planting grass seed). Capture an insect such as a grasshopper or a caterpillar and observe it in the jar for a few days. Students can record their observations in their **Energy Learning Logs** and return the insects to the yard.

When people are learning about food chains, often the most important link of the chain—decomposers—is often overlooked. Decomposers consume and process all the nutrients and stored energy in waste products and uneaten materials. Help students appreciate the role of decomposers in a food chain by building mini food composters. Students can make mini composters by cutting clean,

clear soda bottles in half and poking a few holes in the bottom. Add a mixture of soil and shredded newspaper strips and a few redworms. Add a half cup of fruit or vegetable food scraps. Cover entire bottle with black construction paper. Stir every other day for aeration. Feed the worms once a week or less.

- If redworms are trying to leave the bin, there might be too many worms or the compost might be too hot. Remove excess worms or stir bedding and moisten
- If compost smells there might be too much food, not enough aeration, or too much moisture. Remove old food and bedding and add fresh, moist bedding (moisture level should resemble that of a wrung out sponge).

Have students make daily observations and record how long various materials take to decompose. Encourage them to look for decomposers in the schoolyard soil. Students can make a field guide for their school, identifying decomposers and their valuable role. Remember that the most important decomposers, the bacteria, are microscopic.

