Find a Food Chain

Habitat lab Field Journal Activity Lesson Plans & Resources

Online Lesson Plans & Resources: https://www.alabamawildlife.org/oc-activity-food-chain/

Students will find evidence of a food chain that exists within the school's habitat lab and create a model to show the transfer of matter and energy within the environment between producers, consumers, and decomposers.

Materials: Copies of the Field Journal Activity Page, Clipboards, Pencils, Magnifying glasses, Specimen Jars or Ziploc bags, and Field identification guides such as *National Audubon Society's Field Guide to the Southeastern States*

Duration: Intro Discussion – 30 min. | Outdoor Exploration – 30 min. | Review Observations – 20 min.

STEP 1: Engage through Discussion

The background information and questions below can be used to help introduce the topic, engage the students, and build a foundation to discuss the topic:

Background Information (online as a PDF)

A **food chain** is a hierarchical series of organisms each dependent on the next as a source of food and energy. A food chain describes who eats what and traces the flow of energy and nutrients through an ecosystem. Every living thing, from a one-celled alga to an African elephant needs food to survive and therefore is part of a food chain. Organisms in food chains are in categories called **trophic levels**. The first trophic level, **producers/autotrophs**, make their own food using energy directly from the sun. Plants are the most familiar type of autotroph or producer. The second trophic level includes organisms referred to as **primary consumers** that eat producers. Primary consumers can be **herbivores** (plant-eaters) or **omnivores** (plant & animal-eaters). **Secondary consumers** eat the herbivores, and these can be omnivores or carnivores (animal-eaters). **Tertiary consumers**, which are carnivores, eat the secondary consumers. There may be other levels of consumers before a food chain finally reaches the top predator, also called the **apex predator**. **Decomposers** (or **detritivores**) are the final part of a food chain, eating the remains of dead plants and animals. Decomposers can be scavengers such as vultures or various insects. Other decomposers, fungi and bacteria, help break the organic waste down even more and return the nutrients that provide energy back to the soil as inorganic materials. This completes the life cycle and makes nutrients available to producers, allowing the whole process to take place again through a food chain.

Example Discussion Questions & Answers (online as a interactive PowerPoint or PDF)

Q: What are some of the plants/animals that you eat? Raise your hand if you eat…
A: *Fruit like apples or bananas, vegetables such as carrots or broccoli, or meats such as hamburgers or fried chicken.*

Q: What do you think the chicken ate? How does your body use the chicken you ate?
A: *The chicken could have eaten corn or other plant material. After you eat the chicken, your body uses the nutrients and energy from the chicken to give you energy to move, grow and stay warm.*

Q: How did the energy get inside the corn before the chicken ate the corn?
A: *The energy in the corn (or other plants) originally comes from the sun to start the food chain. This forms a food chain, and YOU are part of that food chain. For example, this Food Chain could include the sun, then corn, then the chicken, and finally you. Sun Corn Chicken YOU*

Q: What is a "food chain"?
A: *A food chain is the path of energy in the form of food from one organism to the next, linking the organisms in a chain with each dependent on the next as a source of food and energy. For instance, a food chain is created when humans/animals eat other animals that have eaten plants. An example is that humans eat chicken, chickens eat corn, and corn plants get energy from the sun.*

Q: What is the original source of energy in all food chains?
A: *The sun! Plants are the original "producers" of energy in the food chain through photosynthesis. The plants use the energy from the sun to convert water and carbon dioxide from the air into sugars (or food) for the plant.*

Q: What are the different levels of a food chain?
A: *The "primary consumers" (herbivores and omnivores) eat the "producers" (plants), and then "secondary consumers" eat the "primary consumers," and the energy is passed on until you reach the "apex predator." The "apex predator" does not have any other animals that hunt it for food. It is the top predator.*

Q: How does energy flow within a food chain?
A: *The energy flows from the sun, through the producers to the consumers. Example: sun □ producer (plant) □ primary consumer (animal: herbivore or omnivore) □ secondary consumer (animal: carnivore or omnivore) □ tertiary consumer (or apex predator)*

Q: How much energy do you think is passed on at each level?
A: O*nly ~10% of the energy is passed on to the next level or consumer each time.*

Q: Where are we in food chains? Can we be the producers? The consumers? The apex predator?
A: *No, we cannot be producers because we cannot produce (or make) our own energy from the sun like plants can. We can be the primary consumers if we eat plants (fruit & vegetables), or we can be the secondary consumers if we eat animals (chicken, cows, pigs, deer, etc.) that eat plants*. Y*es, we are the apex predator because there are no other animals in Alabama that view us as prey. Black bears are considered omnivores, but they do not hunt humans as prey*.

Q: Does the apex predator complete the food chain?
A: *No, The final link in the food chain is the "decomposers" that help return nutrients to the soil so the whole process can start again. When the animals die then decomposers and scavengers eat the decaying animals, and then the decomposers' excrement returns the nutrients (that provide energy) back to the soil. For example, the "castings" (poop) of earthworms are considered rich fertilizer (food) for plants.*

Q: What are decomposers?
A: *Decomposers:*

- *Are the last stop on the food chain.*
- *Eat the things no one else wants to.*
- *Are very small so they can break down large pieces of dead stuff.*
- *Are referred to as nature's recyclers because they help return nutrients to the soil for the plants.*

Q: Why are decomposers important?
A: *Some of the most common decomposers are bacteria, worms, slugs, snails, and fungi like mushrooms. If they didn't do their job the ground would be covered with junk.*

Q: What food chains do you think we can find in our habitat lab?
A: *Answers will vary. Numerous examples of food chains exist in your school's habitat lab, so let the students explore and provide examples of what they think they will find. Discuss an example or two, and review the Example Food Chain Components chart for the activity sheets.*

STEP 2: Explore with Literature

These books can be used to further explore the topic with your students:

- *Pass the Energy, Please!* By Barbara Shaw McKinney (ISBN-10:1584690023)
- *Secrets of the Garden: Food Chains and the Food Web in Our Backyard* by Kathleen Weidner Zoehfeld (ISBN: 978-0385753647)

STEP 3: Explain using Technology

These videos can be used to further explain the topic to your students:

- Free School: Food Chains for Kids (4:57 min.) - https://www.bing.com/videos/search?q=Food+Chains+and+Food+Web%27s&&view=detail&mid=6C19313F64516812034E6C19313F64516812034E&&FORM=VRDGAR
- Odyssey Earth: The Food Chain (4:49 min.) - https://www.youtube.com/watch?v=0ZOvqYypOuo OR https://www.bing.com/videos/search?q=odyssey+earth+food+chain+video&&view=detail&mid=A90DA1367E4C90219543A90DA1367E4C90219543&&FORM=VRDGAR

STEP 4: Investigate through Journaling

The Habitat lab Field Journal Activity Observation Page(s) allow students to apply what they have learned as they investigate and record their real-world observations in their field journals. Before you go outside, don't forget to review the activity tips, activity instructions, and your Habitat lab Rules:

- **Habitat lab Activity Tip:** Before going outside, discuss an example organism that they may find in the habitat lab, and demonstrate how that organism would be included in the food chain diagram on page 2 of the activity. *Optional: Give students an IPad, smart phone or camera to take photos of the organisms they find (instead of drawings) to construct models of food chains.*
- **Activity Instructions observation page(s):** Explore the habitat lab and look for evidence of a food chain (such as a partially eaten leaf or nut from a plant) OR look for a link in a food chain such as a plant or animal. Use a field identification guide such as the *National Audubon Society Guide to the Southeastern States* to help you identify the plant/animal species.
- **Example Habitat lab Rules:** The habitat lab is not a playground, so do not run and do not climb on anything. Remember that the habitat lab provides habitat (a home) for local wildlife, and you should not damage the local wildlife habitat. Therefore, do not pick up wildlife, plants, flowers or rocks. Also, do not feed wildlife.

STEP 5: Review and Assess

Alabama Course of Study Standards for Fifth Grade
Language Arts (2016): 12.) Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text. 13.) Determine the meaning of general academic & domain-specific words/phrases in Grade 5 text, topics, or subject areas. 16.) Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. 19.) By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the Grades 4-5 text complexity band independently and proficiently. 23.) Write informative or explanatory texts to examine a topic and convey ideas and information clearly.
Science (2015): 10.) Construct and interpret models (e.g., diagrams, flow charts) to explain that energy in animals' food is used for body repair, growth, motion, and maintenance of body warmth and was once energy from the sun.

11.) Create a model to illustrate the transfer of matter among producers; consumers, including scavengers and decomposers; and the environment.

Review the students' observations and answers on their activity pages. Ask them to create another example food chain using the "Food Chain Assessment" activity page in the online resources.