

Food Chains, Food Webs, and Biodiversity

Primary

Key Inquiry Questions

1. What are food chains and food webs, and how do they relate to biodiversity?
2. What is biodiversity?
3. Why is biodiversity important?

Learning Outcomes

1. Students will be able to define food chain, food web, and biodiversity by the end of the lesson.
2. Students will understand the importance of biodiversity by the end of the lesson.
3. Students will create a food web based on animals in their community by the end of the lesson.

Sustainability Curriculum Goals

Systems Thinking:

1. Our planet - the biosphere - is a complex system that supplies resources and creates conditions that sustain life on Earth.

Sustainable Futures:

1. Actions associated with a sustainable future reflect values of care, respect, responsibility, empathy, and compassion for all living and nonliving things.
2. Sustainable futures involve actions that work to preserve, protect, and/or restore the natural environment.

Activities/Goals:

1. Students should be able to explain what sustainability is, the importance of ecosystem services and biodiversity.

Overview:

The lesson will begin with the students creating and learning about food chains. Next, students will create a class food web, which they will use to draw pictures and play a game as a means of understanding what happens when plants and animals are removed from the food web (i.e. biodiversity loss/extinction). Lastly, students will think critically about ways they may be harming and can help conserve biodiversity.

Materials

SolarSPELL Resource:

1. For teachers: “Food Chains and Food Webs” (Science > Life Science > Biology > Food Chains and Food Webs)
2. “Biodiversity.mp4” (Environment→ Natural Habitat→ Biodiversity.mp4)

Other:

1. Images (at bottom of the lesson)

Suggested Procedure

Before the lesson, it is recommended that you [the teacher] read the document titled “Food Chains and Food Webs” to familiarize yourself with food chains, food webs, and biodiversity.

Before Lesson:

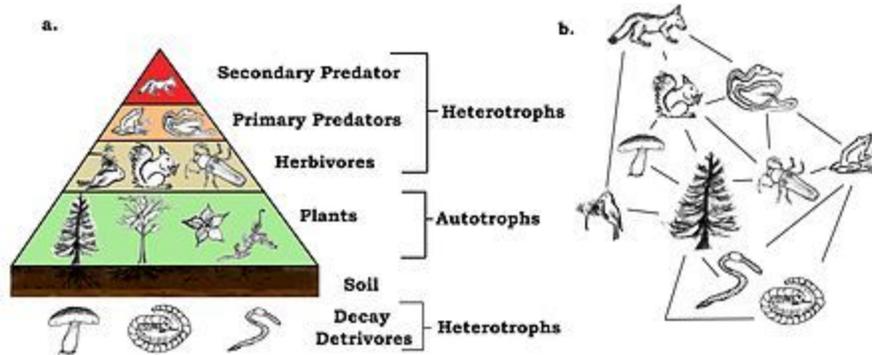
- First ask students where we get our energy from?
 - Answer: the food we eat
- Next, ask students where plants get their energy from?
 - Answer: the sun
- Draw a food chain with arrows in between on the board at the front of the class. The arrows indicate who is eating who.
 - Example: plant → rabbit → wild cat → lion
 - If you do not have a board at the front of the class, gather students around in a circle on the floor, draw the diagram on a sheet of paper, and walk around the circle to show it to them.
- Explain to students that what you have drawn is an example of a food chain. In the example, the plankton is eaten by small fish, the small fish are eaten by tuna, and the tuna is eaten by the orca whale.
- Then tell them the following about food chains, and have them write down what you’re saying in their notebooks:
 - A food chain shows who is eating whom.
 - An animal that eats another animal or a plant is called a consumer.
 - If an animal is eating only other plants they are called herbivores.
 - If an animal is eating only other animals they are called a predator.
 - The animal being eaten by other animals is called prey.
 - Our world has many different food chains.
 - Food chains begin with plants, who can make their own food from the sun, thus, they are the very bottom of the food chain.

During Lesson:

- Divide students into groups and ask them to create their own food chain.



- Walk around and look at all of the students' food chains to ensure they follow the pattern of primary producers (plants) → herbivores (animals that eats plants) → primary predator (animal that eats herbivores) → secondary predator (animals that eat primary predators).
- Have them label which animals are prey and, which are predators. Let students know that one animal can be both a predator and prey, but that the very last one at the end or top of the food chain is called the apex predator because no other animals eat it.
- Explain to students that food chains can be connected to create a food web.
- Write the categories (primary producers, herbivores, primary predators, secondary predators) on the board and have one student per group come up one by one and share their food chain.
 - Explain the difference between primary and secondary predators.
 - Primary predators eat plant-eating animals (herbivores), and secondary predators only eat the primary predators.
 - Write down where each animal/plant goes on the board, including the arrows to create a food web.
 - See image below for example, or refer back to the teaching reading resource:



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- Tell the students that the next activity will be a game and ask them to pick one species from the web to draw.
 - Make sure there are species from each level represented and only allow one species per sheet of paper.
 - After students complete their drawings, ask students to arrange them in a web on the floor according to the food chain.
- The Game:
 - Have the students stand in a circle, facing out, with their drawings placed at their feet.
 - Turn on a video or music and have students walk around the drawings.
 - Music can be found on the SolarSPELL digital library under Creative Arts → Teaching Resources and Classroom Activities → Music, Movement, and Video → Elements Music CD

- While students are walking, you [the teacher] should take out one drawing, which represents the loss of a plant or animal.
- Stop the music.
 - When the music stops the students should sit behind a drawing. There will be one less drawing than students, and that student is taken out of the game.
- Show the picture of the ‘extinct plant or animal’ to the class, explain what it means for an animal or plant to be extinct, and ask what could have happened to make the animal or plant go extinct?
 - Give students 1 minute to talk with their surrounding peers.
 - Extinction: when an animal or plant no longer exists.
 - Ask a few students for their answers.
 - Possible answers: the animal ran out of food, the humans destroyed the plants and animals habitats
- Have the students stand and start the music again. Remove another drawing.
- Continue the same process.
- About halfway through the rounds, ask students to look at the plants and animals left on the floor and compare it to the food web on the board.
 - Ask the students how many of the plants and animals left would be affected by an extinct plant or animal.
 - Answer: All of the plants and animals could be affected by the loss of a plant or animal because they rely on each other for food.
- Repeat the steps until one student is left standing.
 - Ask students what would happen if there was just one plant or animal left on the web.
 - Answer: The one animal would die because it has nothing to eat, or the plant would continue to grow and grow and grow causing other plants to die because nothing is there to eat it.
- After the students discuss what would happen if there was only one plant or animal left on the web, direct students to the resource titled “What is Biodiversity”.
 - Each time a new vocabulary word comes up, pause the video and ask students to write it down in their own words.
 - Example: “Biodiversity is all of the different living things on Earth”.

After Lesson:

- Ask students what they learned from the activity.
 - Possible answers: if animals go extinct it affects the rest of the animals in the food web, a food web is a bunch of food chains, humans can cause animals/plants to die.
- Ask the students how they think humans can positively *and* negatively affect food webs.
 - Have students each write down one positive and one negative in their journals.
 - Example: Cutting down trees to build a home destroys plant and animal habitats.
 - Positive: humans have homes



- Negative: cutting down trees messes with the food web
- As a group, challenge students to answer the following questions in their journals:
 - 1. How does biodiversity relate to food chains and food webs?
 - 2. What happens if humans let animals die?
 - 3. Draw one thing in your house that may have destroyed part of a habitat for animals.
 - 4. What is one thing you could do differently to protect biodiversity?

Assessment:

- Have students work together to observe 2 different ecosystem populations.
 - Find ecosystem images at the end of this lesson. Images can be printed out or shown on the screen/tablets.
 - Students should write down one similarity and one difference between the two different images.
 - Ask students to label, which one is a food web and which one is a food chain.
- After observations are complete, ask students to write down what would happen in each ecosystem if an animal or plant was removed.



