

Students will discover food chains of the saltmarshes and ocean habitats of South Carolina.

OBJECTIVES

- Students will be able to define the terms food chain, producer, consumer and decomposer.
- Students will be able to create food chains to describe the flow of energy in an ecosystem.
- Students will be able to identify plants and animals as producers, consumers or decomposers.
- Students will be able to describe which animals are predators and which are prey.
- Students will be able to explain what would happen if parts of a food chain were missing.

SOUTH CAROLINA SCIENCE STANDARDS

K-PS3-2, K-ESS3-1, K-ESS2-2, K-LS1-1, 2-LS2-A, 2-ESS3-1, 4-PS3-2, 5-ESS3-1, 5-PS3-1, 5-LS2-1, 5-LS1-1

MATERIALS IN BIN

- Copy of “Food Chains” activity
- Aquarium map (with activity exhibits marked)
- Large magnetic dry-erase board
- Ocean food chain magnets
- Saltmarsh food chain magnets
- Food chain arrows and labels (energy, producer, consumer, decomposer)
- Trash (water bottle, fork, straw, plastic bag)

VOCABULARY TERMS

Review terms with students before coming to the Aquarium to ensure that they have a basic understanding of the terms that will be used in the activity! Choose which terms are relevant/need to be reviewed based on your students’ ages

- **Food Chain** – A ranking of organisms that depend on the next as a food source
- **Predator** – An animal that naturally preys on other animals
- **Prey** – An animal that is caught and killed by another animal for food
- **Photosynthesis** – The process through which plants make their own food using energy from the sun, carbon dioxide and water
- **Producer** – An organism that creates their own food (also known as an *autotroph*)
- **Consumer** – An organism that feeds on other organisms in order to gain energy (also known as a *heterotroph*)
- **Apex Consumer** – An organism at the top of their food chain that has no natural predators
- **Decomposer** – A consumer that gets their energy from consuming dead plants or animals
- **Pollution** – An input of harmful contaminants into the environment

BACKGROUND

A food chain is a series of organisms that show the transfer of energy from one to the next. Most food chains on Earth get their energy from the sun. The process in which plants make their own food is called photosynthesis.

Photosynthesis is the process of a plant taking in carbon dioxide and water and creating oxygen and sugars. The sugars are the plant’s “food,” giving it energy to survive. Photosynthesis takes place in the cells of a green

plant (chloroplasts) and the energy to make this happen comes from sunlight soaking into the plant's leaves. Because plants make their own food, they are called producers in the food chain.

Animals that eat other organisms to get energy are called consumers in the food chain. They consume, or eat, to energize themselves. Consumers that only eat plants are called herbivores. Consumers that only eat other animals are called carnivores. Consumers that eat both plants and animals are omnivores. An apex consumer is a consumer at the top of their food chain — nothing preys on them and they don't have natural predators in their ecosystem.

A decomposer is a special type of consumer that gets its energy from consuming dead plants and animals. There are many decomposers in the world that help remove dead matter from ecosystems. Fungi eat dead trees. Bacteria eat dead plants and animals. Many invertebrate animals such as crabs, flies and worms help break down dead plants and animals as well. Without the clean-up crew, our world would be a stinky mess.

In a food chain, a predator is an animal that hunts their prey. Prey is the organism being hunted as food. For survival, plants and animals must find a way to get energy, avoid being eaten by predators and live long enough to reproduce. To have a healthy ecosystem, there must be many different plants and animals. All the living things in an ecosystem make up a food web, which is a series of food chains all connecting together. If too many parts of a food web are damaged or destroyed, it can affect the whole ecosystem.

One way humans have negatively altered food chains and ecosystems is through pollution. Trash, gas, oil and other types of pollution affect living things by damaging their habitats, releasing harmful chemicals and making animals sick when eaten. If one piece of a food chain is removed (like when the population drops or changes drastically) it will affect the rest of the animals in the food chain. It's our job to keep our ecosystems clean by picking up after ourselves and respecting wildlife.

PROCEDURES

Pick up the Exhibit Activity and supplies from the Information Desk. Go to the Saltmarsh Aviary or the Great Ocean Tank to begin the lesson. For this activity you can build a saltmarsh food chain, an open ocean food chain or both depending on how much time you have.

- 1) Review the following with your students (*can be edited based on the age group*).
 - a. What is a food chain?
 - b. What is the energy source for most food chains on earth?
 - c. What is a producer?
 - d. What is a consumer?
 - e. What is a decomposer?
 - f. What is an apex consumer?
- 2) Show them the magnets from either the Great Ocean Tank or the Saltmarsh Aviary bag depending on which exhibit you are at. You can put the magnets around the frame of the board.
- 3) Have the students build a food chain on the large board using the magnetic pictures and arrows. (Be sure the arrows are showing the flow of energy.) **It's not so important that the food chain is built correctly based on what the animals eat, but instead that it makes sense to the students.**
- 4) Have students identify which organisms are predators and which are prey. (Keep in mind that some animals are both.)

- 5) Next, have them label each step of the food chain using the word magnets.
- 6) Take away one of the picture magnets and ask what would happen if all the ____ were gone from this ecosystem. (You can repeat this with different steps of the food chain as reinforcement.)
 - a. The step before the blank wouldn't have anything to eat and would die out. The step after the blank wouldn't have any predators and would start to over populate and in turn eat all of its prey until they were gone.
 - b. You can then explain a food web. Emphasize the concept that animals eat many different types of food items, and that is why it's so important to have many different plants and animals on earth.
- 7) Now introduce trash to the ecosystem and ask how it affects the plants and animals in a food chain. Talk about using reusable water bottles, decreasing single-use plastic and using canvas bags.
- 8) Allow students to look for the plants and animals from the activity within the exhibit (Saltmarsh Aviary for swamp food chain and Great Ocean Tank for open ocean food chain). Hint: Only the **bolded** options can be found in the exhibits, but you can ask students where in the habitat the unbolded organisms would be found in the wild:
 - a. Great Ocean Tank
 1. **Black nose reef shark** (apex consumer)
 2. **Barracuda** (apex consumer)
 3. **Loggerhead sea turtle** (apex consumer)
 4. **Tarpon** (consumer)
 5. **Jack crevalle** (consumer)
 6. **Moon jellyfish** (consumer)
 7. **Cownose ray** (consumer)
 8. **Triple tail** (consumer)
 9. **Sergeant major** (consumer)
 10. **Coral** [*not real*] (consumer)
 11. Horseshoe crab (decomposer)
 12. Algae (producer)
 13. Sun (energy source)
 - b. Saltmarsh Aviary
 1. Great Blue Heron (apex consumer)
 2. **Spoonbill** (consumer)
 3. **Red drum** (consumer)
 4. **Mullet** (consumer)
 5. **Spadefish** (consumer)
 6. **Burrfish** (consumer)
 7. **Sheepshead** (consumer)
 8. **Northern pintail duck** (consumer)
 9. **White ibis** (consumer)
 10. **Oysters** [*not real*] (consumer)
 11. Fiddler crab (decomposer)
 12. Phytoplankton [*not real*] (producer)
 13. **Spartina** (producer)
 14. Sun (energy source)
- 9) Repeat steps 2–8 at the other exhibit if time allows.

Food Chains



10) When you're done, put all of the magnets back in the correct bags inside the bin. Return the Exhibit Activity to the Information Desk.

*Supplemental material: Have your students read "A Day in the Salt Marsh" and/or "A Day in the Deep" and create a food chain from the animals mentioned throughout the book. Books can be purchased at Ardordale Publishing in Mount Pleasant, South Carolina or online.