



Diet-Food Web Lesson Plan 3-5



Objectives:

- Be able to describe the different levels of an ecosystem: producers, consumers, and decomposers
- To learn the diet and feeding habits of some of our local marine species in South Carolina waters by looking at stomach content data.
- Students will understand how scientists collect diet composition data and why it is important to understand the health of estuaries and different marine environments.
- Students should be able to create a food pyramid with the animals/plants listed and explain why each level is important and why the populations of organisms decrease going up the pyramid.

Materials:

- ✓ Blank food web
- ✓ Diet composition sheets for Croaker, Kingfish, and Weakfish
- ✓ PowerPoint

Research Questions:

- What can you learn about these fish by dissecting them and looking at their stomach contents?
- Where does each organism get its energy in a food chain?
- What is the most common prey item for the Southern Kingfish?
- Out of all 3 fish, which had the highest percentage of its top prey item? Write the percentage of what the prey item was.

- **1. POSSIBLE ANSWER:** You can learn what many different fish species eat by looking at their stomach contents. You can also learn more about each fish's habitat by what kind of prey they are eating. If they eat different prey species from different habitats in the ocean, then that can tell us that that fish travels to different areas, migrates, or is a fish that is constantly on the move. You can learn so much more by dissecting the fish in general including the internal anatomy, how certain fish compare to other fish, and how their reproductive organs work.
- **2. POSSIBLE ANSWER:** Plants get their energy from the sun, consumers (herbivores or omnivores) get their energy from the plants they eat, secondary consumers get their energy from the animal they eat, apex predators get their energy from the animal they eat, and lastly the decomposer gets its energy from the dead matter-can give different organisms as examples. The flow of energy starts with the sun and is then transferred from each organism until it completes the lifecycle by returning the nutrients back into the soil or oceans and it starts all over again.
- **3. POSSIBLE ANSWER:** Jackknife clams/razor clams or bivalves. Mollusks can also be an answer.
- **4. POSSIBLE ANSWER:** Weakfish, 20.9%, Striped Anchovy

Instructions:

- Go through the PowerPoint
- Stop at the slides where students need to fill out food web/answer questions

Background Information:

In order for biologists to understand our marine ecosystem, they have to conduct research by using multiple different methods. There are several different vessels taken out by SCDNR for different forms of sampling. The biologists take samples to get a better idea of where animals live by trawling a large net behind the research vessel. This is the most common form of sampling and can be done offshore, inshore, in estuaries, in salt marshes, and up the rivers along our coast. By collecting animals in different areas, biologists not only learn where these animals live, but also if certain species live in multiple areas during different stages of their lives or if they are migratory. They do measurements of all of the animals they catch and keep a log of everything. They bring some fish back for dissections to be able to learn more about them. While looking at the internal anatomy of the fish, biologists always open the stomach to learn what these animals eat. These diet composition data sheets are from our researchers and biologists that have dissected multiple animals to determine their diet. They have to do this continually because of threats like climate change, pollution, habitat destruction, etc.. Where these animals live is always subject to change, and what they eat might also have to change depending on if they are forced to leave their environment. By doing this research, this is how we determine what fish and other animals are sustainable to commercially and recreationally harvest and why there are regulations. This also helps manage our fish populations so we can make sure to maintain healthy ecosystems.

Explaining how the food chain works:

- All food chains and food webs start with the **sun**.
- Producers** make up the first level of the food chain, which are plants. Plants make their own food by using a process called *Photosynthesis**
- Primary Consumers** are animals that eat plants, also known as *herbivores*.
- Secondary Consumers** are animals that eat other animals, also known as *carnivores*. They could also be animals that eat plants AND other animals, which are known as *omnivores*.
- The chain will eventually reach the top predator known as the **Apex Predator**. This consumer has the least number of natural predators.
- Finally, you have the **Decomposers**. These could be animals like the crab who is a scavenger, or bacteria and fungi. They complete the lifecycle and return nutrients back into the soil or oceans and the food chain starts all over again.

Food Web: Explain that they can choose any animals from the diet data of the fish-it does not have to be their most common prey. Also, there can be many lines connecting. Explain the energy flow between all of these animals and why it is important to study these animals so we can make sure our populations stay healthy. Students can use any marine plant for a producer and decomposer from the ocean-try to make sure they choose something specific. Marine producer-phytoplankton, seaweed, sea lettuce, algae. Marine decomposer- any crab species, worms, bacteria.