

OIMB GK12 CURRICULUM

5th Grade

60 minutes

OPEN OCEAN FOOD WEB

Oregon Science Content Standards:

5.2 Interaction and Change: Force, energy, matter, and organisms interact within living and non-living systems.

5.2L.1 Explain the interdependence of plants, animals, and environment, and how adaptation influences survival.

Ocean Literacy Principles:

5. The ocean supports a great diversity of life and ecosystems

6. The ocean and humans are inextricably interconnected.

Goals: Students will be able to

- understand the complexity of food webs in a marine environment
- distinguish between a food web and a food chain
- understand relationships between trophic levels

Concepts:

- Food webs are made up of many interacting food chains.
- Food webs enable us to see relationships between different organisms, including many different producers and consumers.
- Producers make their own food (usually from the sun) and consumers must get food from other sources (from producers or other consumers).

Materials:

- Ball of yarn or twine
- Organism cards made of pictures of open ocean organisms (phytoplankton, zooplankton, various fish, invertebrates, marine mammals, etc.) with descriptions of the types of things each organism eats and is eaten by
- One sheet of paper and pencils, or a blank transparency and transparency pen for each group of 4 or 5 students

Lesson Plan:

Discussion

1. Ask students to define a food chain. Write a student-given example of a food chain on the board (e.g. grass -> rabbit -> fox for a terrestrial example; phytoplankton -> zooplankton -> small fish for a marine example)
2. Explain that food chains are made of producers and consumers. Define producers (*make their own food, usually from sunlight*) and consumers (*must get food from other sources*).

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Point out the producer and consumers in the food chain example on the board. Have students identify other examples of producers and consumers.

3. Remind students that the arrows go in the direction of the food/energy (e.g. from the grass to the rabbit, from the rabbit to the fox).
4. Discuss that each level represents a trophic level, or energy level. It takes quite a bit of grass to provide enough energy for one rabbit, and many rabbits to provide enough energy for a fox. A rule of thumb is that each trophic level needs 10 times its biomass to support it.
5. Discuss how most organisms eat more than one type of thing, and can be eaten by a variety of animals. In reality, there are few simple food chains. Most organisms are connected in more complicated food webs.
6. Tell the students that they are going to experience what happens when they connect many different food chains together in a food web.

Activity

7. Hand out a marine organism card to each student. Clear out or use an open space in the classroom or outside. Have the students stand in a large circle, creating an open space in the center.
8. Create a standard food chain in the center of the circle: e.g. phytoplankton -> zooplankton -> small fish. Have students with the correct organism cards move into the center. Have the phytoplankton hold onto the end of the yarn and hand the roll to the zooplankton, who takes hold and hands the roll to the small fish. Once this small food chain is created, ask the students what *else* the small fish **would eat OR be eaten by**. Toss the yarn to the student holding that organism card. Continue tossing the yarn back and forth across the circle until every person in the class is connected to the food web.
9. At the end, as they hold the yarn, ask the students what would happen if we got rid of a top predator. (*There might be more of an intermediate predator, but as their number increased, they would eat more of whatever they eat. The system would become unbalanced.*) Then, ask what would happen if we got rid of the phytoplankton. Discuss the loss of producers in a food web or chain. (*Producers are the base of the food web—without the producers, the food web would collapse.*)
10. Discuss with the students the differences between a food chain and a food web.
11. Have the students identify a producer in the ocean (e.g. phytoplankton), a consumer (e.g. zooplankton), and a consumer of a consumer (e.g. anchovy).
12. Have students return to their desks (still with their organism cards). Put the students in groups of 4 or 5, and hand each group a paper or transparency, and have the students write their own organisms on the paper/transparency. They then need to figure out how to connect the 4 or 5 organisms that comprise their group into a food web. Do they need to list additional organisms?
13. Have student groups orally present their food webs to the rest of the class.

Assessment: The overhead transparency or paper on which the group of students made connections between organisms to create a food web, and the students' oral presentations.