**Shorebird Food Webs**

**Preparation**
1. Select the habitat food web that you want to explore with your students from the **Shorebird Food Web Cards**: Mudflats, Rocky Intertidal Habitat, Salt Marsh, Tundra

2. Photocopy the Food Web Cards onto cardstock and cut them out.

3. If you have more students in your class than you have cards, photocopy and cut extra producer cards. It is okay for more than one student to represent the producers in the food web. In reality, a healthy food web requires a greater number of producers to support the other organisms.

 **Procedure**

1. Ask the students to form a circle. Hand out a food web card to each student. Save the sun and bacteria cards for yourself. Let the students know that it is okay for several people to have the same cards.

2. Ask the students if they know why several students are representing ***producers***in the web? These are the producers at the base of the food web which usually do outnumber the ***consumers***in nature. They have to support the animals at the top.

3. Have the students read their cards silently, then aloud to the rest of the class. Ask them to listen to each other carefully for clues to the order of the web. Explain that they will have to connect their organisms to other organisms they depend on and each time a food web connection is made, matter is moving through the ecosystem and energy is being transferred.

4. You, the “sun,” start the web activity. Read your card, then wrap one end of the yarn around your hand and pass the ball of yarn to the student representing the organism you are connected to. For example, the “sun” would connect to an organism that makes its own food like phytoplankton and say “ I am the sun and I am providing energy for the phytoplankton to grow.” NOTE: Connections can be indirect— that is animals also require air, water, and sunlight.

5. Now the student with the ball of yarn reads his or her card and passes the ball to the organism he or she is connected to. For example, a student with a phytoplankton card would then pass the ball of yarn to an animal that eats it and say “I am a phytoplankton. I’m a **producer** and provide food for \_\_\_\_. When \_\_\_\_ eats me, matter is moved and energy is transferred in the ecosystem.” (Animals should identify themselves as a **consumer**.)

6. Continue this until all the students are connected by the web of yarn. Ask them to visualize the yarn as energy connections that go only in one direction as **consumers** eat **producers** or other consumers as food.

7. If you are focusing this unit on shorebirds, ask the students who is holding a shorebird card. Ask: *What if something happened to shorebirds along their migration path and they couldn’t find enough food at one of their stop-overs*? Have the “shorebirds” give a “tug” in the direction of what eats them and have other students pass the tug on up the food web. (You can also select other types of migratory bird for this activity.)

*What components of the ecosystem do the shorebirds depend on to survive*? Have the “shorebirds” give a tug in the direction of what they eat. Again have the students pass the tug down the food web to the sun, air, and soil or rocks.

7. Ask what’s missing from the food web (**decomposers**, e.g., bacteria).Read the bacteria card. Ask:
*What role do bacteria play in the food web*? (**detrivore, consumer, and decomposer**) Emphasize that all **detrivores** (animals that eat other dead organisms) are consumers, but only some, like bacteria are **decomposers**.
*What happens to the matter in a living thing after it dies*? (It is “recycled” into the food web after being broken down by bacteria and other **decomposers** into nutrients that can be used by producers in the process of photosynthesis.)
Review: *How does energy move through the food web*? (It all comes from the sun, flows upward to the top of the food web with most used for the maintenance and growth in each organism or “lost” to the environment. It is not recycled.)

8. Ask students if they think an ecosystem with a lot of connections is more “healthy” than one with fewer. After some discussion about how to define the health of an ecosystem, provide the definition of a healthy ecosystem as one in which “multiple species of different types are each able to meet their needs in a relatively stable web of life.” Remind them what happened when you removed a species from the food web.

**Extension:** *Food Webs in Other Habitats*
Make another set of food web cards for a habitat not found in your area. After creating this food web as a class, ask students to research this food web further. What other producers and consumers live there in addition to shorebirds? What are the environmental conditions in this habitat?