Friends of the Island Fox

a Program of the Channel Islands Park Foundation, a 501 (c) (3) public benefit org.
1901 Spinnaker Drive, Ventura CA 93001
(805) 288-4123 or admin@islandfox.org Visit us at www.islandfox.org

Grade Level: 3 and up

Objective: Students will 1) construct a food web, 2) understand how elements of an ecosystem are interconnected, 3) make connections between themselves and natural ecosystems.

Method: Students represent various plants, animals and resources in the Channel Island web of life and physically weave the interconnections between the elements they represent.

Materials: A ball of thick yarn. Scissors (optional).

CA Standards:

Science: 3.3c,d, 3.5a,d;
4.2a,b, 4.3a,b,c, 4.6c;
6 Ecology 5b;
7 Evolution 3.5;
9-12 Ecology 6a,b,c, 8d

EEI:

Principle III, concept C
Principle IV, concept B
Principle V, concept A

Island BioWeb

The Channel Island fox is a "keystone species" on the Channel Islands because it has complex interconnections with other plants and animals in the ecosystem. If this important species should disappear or go extinct on the islands multiple other species and the ecosystem itself would be affected.

The relationships between the island fox and other living things on the island goes beyond food and a food web. The plants also provide shelter, fleshy fruits provide moisture; this is a web of life, a bioweb.

Background: The **island fox** is very omnivorous. In order to survive in a limited ecosystem, the island fox eats whatever it can find.

In the summer and fall, the island fox eats primarily fruit from native plants like:

Catalina cherry	**prickly pear cactus**
toyon	**island red berry**
lemonade berry	**manzanita**

All of these plants are producers, converting the sun's energy into leaves and fruit. When the island fox consumes the fruit it then disperses the seeds of these plants in its droppings, thereby spreading the plants across the island habitat. The plants and the island fox have a symbiotic relationship. They both benefit from their relationship.

Many other animals on the islands are also consumers that depend on these plants for food and/or shelter:

Jerusalem cricket (decomposer)	**song sparrow**
grasshopper	**horned lark**
moth	**deer mice**

The **western fence lizard** and the **yellow-bellied racer snake**, in turn, eat these animals. During the winter and spring, island foxes prey on all of these animals.

The **spotted skunk** and **pallid bat** also consume the insects that eat the plants which depend on the island fox to move their seed.

The **bald eagle** eats **fish**, but it is directly related to this island bioweb because it is territorial and keeps the golden eagle from nesting on the Channel Islands. The golden eagle can prey on the island fox and nearly caused its extinction on San Miguel, Santa Rosa, and Santa Cruz Island in 2000. The bald eagle also uses the plants on the island to build its nest. Dead fish brought onto the island by the eagle also add nutrients to the soil.

While many of the animals get the moisture they need from the food they eat, the plants depend on rain and fog for **water** and the **soil** for nutrients. All of the island residents also breathe oxygen or carbon dioxide and depend on clean **air**.

Procedure:

1. All of the plants, animals and elements in **bold**, above, are vital participants in the Channel Island web of life or bioweb. Reviewing the concepts of producers and consumers, discuss the animals and plants on the Channel Islands.

   Option: Have each student or a group of students research specific plants and/or animals in the ecosystem. What does each species need to survive? Have students share what they have found with the class.

2. Bring the group into a circle.
3. Start with a participant playing the role of the island fox. Have the “island fox” loop the yarn loosely around their wrist. Ask for someone to name a species or resource that the island fox has a connection with, something that it needs or something that needs the island fox. Have the island fox toss or roll the ball of yarn to this second player. Each connection should be a single link. For example:

   island fox eats Jerusalem cricket
   Jerusalem cricket eats Catalina cherry roots
   Catalina cherry needs island fox to move seeds
   island fox eats toyon berry
   toyon provides shelter for song sparrow
   song sparrow eats Catalina cherry
   Catalina cherry twigs are building material for bald eagle nest
   Bald eagle protects island fox from golden eagle
   island fox eats deer mouse
   deer mouse eats lemonade berry

lemonade berry needs soil
soil is created by decomposer, the Jerusalem cricket
Jerusalem cricket is eaten by spotted skunk
spotted skunk digs burrows used by island fox
island fox eats prickly pear cactus

4. With each connection the yarn is given to the next player and they loop it around their wrist. The more connections that are made, the more interconnected the web will become. Students should be encouraged to make as many different connections as possible.

5. Ask the students how they fit into the Channel Island ecosystem? What connection can they make to any of the plants, animals, or resources? Catalina cherry and lemonade berry fruit are edible by humans. The Catalina cherry could provide wood for a fire to cook food. The fish eaten by the bald eagle are the same ocean fish that people might eat. The Jerusalem cricket provides the healthier soil for plants that people might eat. People breathe the same air and drink the same rain water that the island plants and animals use. The plants create air for the animals and humans to breathe.

Assessment:

6. Ask the students what they think will happen if one of the elements is removed from the web? The most dramatic example is to take a pair of scissors and cut all of the yarn connections to one of the major elements, like the island fox. If there are only a few connections cut the yarn links originating from two elements–a major plant and the island fox. Instead of cutting the yarn, you can have the designated participant push the yarn loops off of their wrist.

7. When the ecosystem web falls apart, ask the participants what they think will happen to the plants and animals that are remaining? What will happen to the ecosystem? What can people do to stop the ecosystem from falling apart? Why is it important for the island animals and for people, that the island food web stays intact?

Extension:
Create a Channel Island bioweb on a bulletin board using yarn to connect images of plants, animals, and resources. For each species or resource have students create profiles in the form of personal ads which briefly state what they are looking for regarding needs and what they have to offer others.