

# **Community in the Classroom Presentation Plan**

**Lesson Name** Food webs alive!

**Presenter(s)** Members of the Entomology Student Organization at UC-Berkeley

**Grade Level** 4      **Standards Connection(s)** Life Science: producers and consumers make up food webs

## **Abstract:**

Our visit will introduce students to what it's like to "make a living" as an insect. We will talk about the different roles that insects play in ecosystems. First, we will do a brief intro section with new vocabulary and concepts. Next, we will make a living food web with each student assigned an insect or plant. During this we will highlight how interconnected food webs are. There is an optional follow-up activity, depending on how much time the teacher is able/willing to allocate, where we will build two food pyramids with blocks featuring photos of the same insects/plants as food web. Through this game, we will begin to tackle one important application of food web ecology which is pest control. Students will be divided into 2 teams and will compete (by answering questions) to get to take a block out of opposing team's pyramid. Eventually one pyramid will fall over ending the game. We will close by reviewing concepts learned and hand out insect coloring books for everyone to take home.

**Vocabulary/Definitions:** producer, consumer, predator, herbivore, parasitoid, food web, food pyramid

## **Materials:**

Name tags with photos and descriptions, yarn, clips, blocks with photos, insect coloring book, insect erasers (and insects? pinned specimens, live insects: aphids, parasitoids, apples with codling moth, spider mites?).

## **Classroom Set-up:**

We need a rather large space in order to make the food web—either in the classroom or maybe out in the hall? Chalk or white board to write definitions as we discuss them.

## **Classroom Visit**

### **1. Personal Introduction:** 2 Minutes

We are graduate students at UC Berkeley. We study insects and feeding relationships and are here to talk to you today about FOOD WEBS. First we're going to go through some basic vocabulary and then we'll play some fun games.

### **Topic Introduction:** 10 Minutes

Does anyone know what a \_\_\_\_ is? (Clarify, below. Write on board.) Can you think of an example of a \_\_\_\_?

Producer: something that makes its own food for energy (PLANTS)

Consumer: something that cannot make its own food, so eats others for energy (ANIMALS)

Herbivores, predators, and parasitoids are all consumers

Herbivore: an animal that eats only plants (ex: cows, grasshoppers)

Predator: an animal that catches, kills, and eats other animals (ex: wolves, spiders)

Parasitoid: FIRST: does anyone know what a parasite is? Something that lives on or in an animal, eating it, but not killing it (ex: fleas, ticks). A parasitoid lives on or in an animal (usually an insect), eating it and killing it (ex: we'll meet some parasitoids in the next activity)

Food web: describes the feeding relationships between plants and animals, showing the linkages between what eats and what is eaten

Food pyramid: another way of describing feeding relationships, but focusing on LEVELS instead of LINKS.

Producers are at the bottom, and consumers are above (with herbivores on 2<sup>nd</sup> level, predators 3<sup>rd</sup> and higher)

### **2. Learning Experience(s):** 40-60 Minutes

**Food web activity:** 40 minutes- Hand out name tags, split the students into four groups based on their nametag

GROUP 1- grapes, spider mites, predatory mites

GROUP 2- blackberry, leafminers, leafminer parasitoids



GROUP 3- pear, codling moth, lygus bugs, codling moth parasitoid, spider

GROUP 4- apple, aphids, syrphids, ladybugs, lacewings, aphid parasitoid

Groups 1 and 2 are simple chains and can be put together—these are the easiest two chains to build. Groups 1 and 2 will go with the teacher and Groups 3 and 4 will go with each of the graduate student volunteers. In each group, we'll start with the plant and have the students read their cards aloud. (There will be duplicates of plant cards to fill in to the appropriate number of students-- 17 different cards, so 13 extra plants total. Organize the duplicates to stand together.) Whomever the plant is connected to will read their card next, and yarn will be used to attach them together using the clips on their nametags, and so on up the food chain. NOTE: SOME MEMBERS WILL BE MISSING, BECAUSE THEY HAVE BEEN ASSIGNED TO OTHER CHAINS. Each chain will have its own color of yarn (eg, green for 1, purple for 2, yellow for 3, red for 4).

Once the chains are completed, the separate chains will be brought together to make a web. Starting with blackberries, we'll ask who else eats them besides leafminers (they say mites and aphids, which connects them to the grape and apple chains). Then ask pears who else eats them (mites, aphids), and apples (codling moth, lygus bugs, mites). Use the color of yarn assigned to the plants' group to connect these, asking the herbivores "how do you eat this plant? Do you chew it? Do you suck it? Do you burrow inside?" to demonstrate the different ways of making a living as an insect. Now ask the mites who else eats them (ladybug, lacewing), and connect them using any color of yarn the mites are currently attached with. Repeat for all the rest of the herbivores, again asking the predators/parasitoids as they are connected: "how do you eat this insect?" to show them the difference between predators and parasitoids. Finally, end with the predators, who will all connect to the spider, since the spider is a top predator that eats both herbivores and other predators. Ask spider to read their card again, to show the many different ways spiders catch their prey.

Then, when the web is complete, we can start to test it, i.e pull on one part or take out certain people. Make sure to emphasize that we've picked some major players in this particular food web, but it would be impossible to include everything. Can you think of something that's missing from this food web? (HUMANS!)

**OPTIONAL Pyramid game:** 20 minutes- 2 pyramids, one for each team. Students get to take one block out of other team's pyramid for each question they answer correctly. When one team's pyramid is knocked over other teams wins. Students will keep their cards from the food web activity and the questions will follow the format: "Is a \_\_\_\_\_ an herbivore, predator, or parasitoid?" (The blank is one of the insects we just learned about in the previous exercise.) This will be rapid-fire, point randomly at a student and they have three seconds to answer or it goes to somebody else. There is no penalty if they don't get it right; they just don't get to take a block out. There will also be bonus questions if they get the answer right (like double jeopardy!). If they answer this right, they get a prize (insect erasers). Note: all students will get prizes at the end.

Prize questions:

1. A pest is an insect that eats our crops. Is a pest an herbivore, predator, or parasitoid? (HERBIVORE)
2. One way to reduce the number of pests is to promote the insects that eat them. What insects would you use to do this? (PREDATORS, PARASITIDS)
3. If you spray your plant with chemicals/pesticides, you'll kill all the insects on it. But pests usually come back first. What do you think will happen to the plant then? (PESTS WILL EAT THE PLANT, NOTHING WILL BE EATING THEM, SO THEY WILL BE EVEN WORSE PESTS)
4. Can you think of any other reasons why it might be bad to spray chemicals/pesticides? (PESTICIDES CAN HURT HUMANS AND OTHER ANIMALS, TOO—NOT JUST INSECTS)

### 3. Wrap-up: Sharing Experiences and Building Connections 5 Minutes

*Potential ideas:*

- Go back to original vocab, now what can you tell me about a \_\_\_\_\_?
- Personal experiences with pests (gardens, household)
- Organic food: what is it and why does it matter?
- Would you like us to take extra time to show them some specimens? This is the teacher's option. We have access to a lot of pinned bugs and a few lives ones as well.

### 4. Close: 2 Minutes

Distribute insect coloring books and erasers.

Include links to UC IPM site?

Beneficial insect plantings guide for their parents who garden?

**TOTAL 60-80 Minutes**



## **Follow-up – After Presentation**

*Suggest students write a letter explaining “How we learned about \_\_\_\_\_?”*

*List or attach examples of activities, websites, connections for additional learning.*

*Attach worksheets, hand-outs, visuals used in classroom presentation.*

