

Bay Area Scientists in Schools 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: Are you struggling to explain the complexities of food webs in a creative, interactive manner? Active and engaging, this lesson will cover important curriculum standards while leaving your students with a memorable experience. Concepts covered include energy transfer, types of eaters, and the broad implications food webs have on entire communities of organisms. Your students will play an active role in creating food webs and discussing the vital role each of the organism plays in maintaining a food web, and will be left with a greater appreciation of their role in maintaining ecosystems.

Vocabulary/Definitions: *3 – 6 important (new) words*

- Omnivore- an organism that obtains nutrients from both plants and other animals
- Herbivore- an organism that only eats plants
- Carnivore- an organism that only eats other animals
- Food web- energy flow between organisms living in an ecosystem
- Ecosystem – [define]
- Organism- a living thing
- Decomposer- an organism that cleans up after other organisms when they die, loose parts, etc.

Materials:

What will you bring with you?

Organism head pieces- which we will supply- for each food web

What should students have ready (pencils, paper, scissors)?

None

Classroom Set-up: *Student grouping, Power/Water, A/V, Light/Dark, set-up/clean-up time needed*

Students should be separated into three groups for this lesson with plenty of space to move around. White-board/chalkboard space is required. No other special requirements.



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Classroom Visit

1. Personal Introduction: _____ 1-2 Minutes

Who are you? What do you want to share with students and why? How will you connect this with students' interests and experiences?

Hi! We are graduate students from UC Berkeley. My name is and these are my friendsWe study biology and are here today to share a little bit of our world with you.

Topic Introduction: _____ 10 Minutes

What questions will you ask to learn from students? Big Idea(s), vocabulary, assessing prior knowledge...

What did you have for dinner last night? What things were in your dinner?

>In this part of the lesson we will separate what the students ate for dinner into different categories ie vegetables, meat, grains, dairy, etc. This will be written on the board

What is required for X to grow?

>plants require sunlight and make their own energy. This energy is transferred to herbivores when they eat plants/seeds. Omnivores require plants and other animals, carnivores require meat

Does any one know what a food web is?

>a food web describes the way energy is transferred between organisms or *living things* living in the same place. For example, a food web could include a seed, a mouse and a hawk. The mouse needs to eat the seeds to survive – it gets energy from them - and the hawk needs to eat the mouse. The hawk and mouse can eat other things, but the mouse can't eat the hawk - the energy flow between them is generally the same.

What happens when things die?

>here introduce decomposers and their peripheral but essential role in food webs

Do you think there is a hierarchy in food webs?

>answer- yes. address potential consequences of having a hierarchy and draw on board

What part in the food web requires the most energy to live/least energy? Why are there more plants than carnivores? Draw an example food web at this time.

>more plants because all energy is obtained from the sun. plants are eaten by herbivores- grasses have little energy, so organisms that eat plants must eat a lot. organisms that eat other animals require lots of energy, but can go many days without eating because one good hunt can supply an organism with enough energy to last for weeks



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2. Learning Experience(s):

20-25 Minutes

What will you do, what will kids do? Demonstrations, hands-on activities, images, games, discussion, writing, measuring... Describe in order, including instructions to kids.

>In this part of the lesson, the students will be given headbands with different organisms on them. One presenter will be assigned to each group to help the students and to prevent chaos. The students will not know what organism they represent. In each group, students will describe the organisms on the other student's heads to help the students discover the type of organism or role of the organism they represent. Students should not directly reveal the name of the organism, rather each student will use the words they learned in the previous section to describe the nature of the organism. Each group will have 4-5 different layers and students should create food webs according to their role in the food cycle. The students will be reminded that some things are eaten by many organisms and some organisms are important at various levels in the foodweb (ie decomposers). Once students arrange themselves in proper food webs, they will be told what organism each student represents. Specific organisms will be removed by the presenters to illustrate what would happen to the rest of the food chain in the absence of one of the members of the food chain. For organisms that are not readily identifiable, the pictures will be assist the students as they determine the nature of an organism. Food webs will be united by the decomposer in each web (ie dung beetles clean up after everything else in the savanna food web).

food webs:

- grass/fruit, antelope, baboon, lion, dung beetle
- phytoplankton, zooplankton, anchovies, tuna, shark, sea urchin
- acorn, mouse, snake, owl, earthworm
- algae, fish, seal, arctic fox, polar bear, crab

3. Wrap-up: Sharing Experiences

5-10 Minutes

Putting the pieces together – how will students share learning, interpret experience, build vocabulary?

Now that you have successfully built different food webs, which members of the foodweb do you think are most important?

>all organisms are important. the loss of one organism can make the rest of the food web collapse. if students are having a difficult time, one food web will be used as an example and one thing will be removed. students will be asked how this would affect the rest of the web

Why do you think there are fewer carnivores than plants?

>carnivores require more energy to survive and energy is lost at every stage in the food chain. Need more dense sources of calories, fewer organisms to feed on in the lower levels prevent over growth from one carnivorous species.

What do decomposers do in the food web? What would happen if there were no decomposers?

>lots of dead organisms without decomposers. need decomposers to recycle the nutrients, minerals, and other compounds found in all living things.

Can you think of any other foodwebs?



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4. Connections & Close:

_____ 5 _____ Minutes

What else might kids relate this to from their real-life experience? How can they learn more? Thanks and good-bye! Clean-up.

The way we manage our food has broad implications on other parts of the food web. For example, what would happen if we took too many tuna out of the ocean?

>this would result in perhaps too many sardines and not enough food for sharks

Thank you for your time!

Total 50 – 60 Minutes

Follow-up – After Presentation

Suggest students write a letter explaining “How we learned about food webs?”

Have the students create other food webs and think of how humans have altered the environment.

Here you may want to draw in how some species have gone extinct due to the destruction of another species/environment and how this affects the entire food web. Also, have students draw food webs in a hierarchical manner and note how many organisms are found at each level in their food web.

Food Chains and Webs – (BBSRC) In this activity, learners investigate feeding relationships. Learners complete a food web and then make a mobile to represent a food chain. Use this activity to talk about predator/prey relationships and ecosystems.

<http://www.bbsrc.ac.uk/web/FILES/Resources/discovery5.pdf>

Food Chain Game - In this outdoor game, learners role play populations linked in a food chain. The resource suggests a chain with plant, grasshopper, frog, and hawk, but other food chains can be role-played, for example plankton, anchovy, salmon, sea lion. The more "animals" (learners!) the merrier for this active game.

<http://www.outdoorbiology.com/files/resources/activities/FoodChainGame.pdf>

Reading Connections:

- Where Else in the Wild? By David M. Schwartz and Yael Schy – This volume is ideal for introducing a unit on survival strategies or for extended discovery at a classroom station. The adaptations of both predators and prey are included, so the book can also be used for lessons in food webs, habitats, and life cycles. <http://www.nsta.org/recommends/ViewProduct.aspx?ProductID=19794>
- I Want to Be an Environmentalist by Stephanie Maze and Catherine O’Neil Grace – Describes career opportunities within the field of environmentalism and suggests ways to pursue such a career. http://books.google.com/books/about/I_Want_to_Be_an_Environmentalist.html?id=vs1TPgAACAAJ



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- At Home with the Gopher Tortoise by Madeleine Dunphy - This book gives a simple yet in-depth look at the importance of an unassuming and often overlooked animal. Surprisingly, the gopher tortoise significantly affects more than 360 different kinds of animals that depend upon its burrows for shelter, food, or a place to raise young. This is a fascinating look at how one species can affect the fate of many.

<http://www.nsta.org/recommends/ViewProduct.aspx?ProductID=20324>



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