3-5 Life Science
3-5 Nature of Science

Southern Nevada Regional Professional Development Program

Food Webs Unit

INTRODUCTION

We are part of a food chain living in an ecosystem everyday of our lives. Children are naturally curious about daily occurrences that impact them directly, and eating is one of them. This unit is an introduction to food chains and the transfer of energy in an ecosystem.

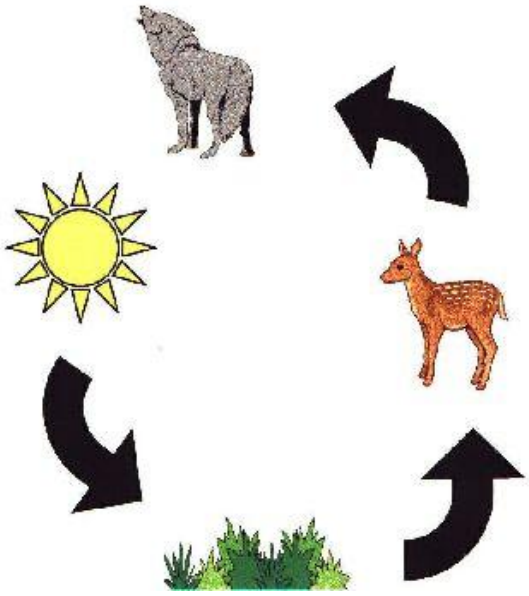
WHERE'S THE SCIENCE?

Our **environment** is everything that surrounds us and influences an organism. Our **ecosystem** is a system of interacting organisms and nonliving factors in a specified area. The transfer of energy in an ecosystem is called a **food chain.** All of the food chains then connect to form a **food web.** There are three categories of organisms in a food chain, **producers, consumers,** and **decomposers**. The Sun is the primary source of energy for a food chain. It provides energy for green plants, **producers**, to make their own food. **Consumers**, animals that eat either plants or other animals are the next step in the food chain. They are followed by decomposers, living things that get their energy from breaking down dead organisms. All of these organisms need nutrients, from their energy source, to survive. **Decomposers** return many of those nutrients back to the soil for the cycle to continue. Common decomposers are mushrooms and earthworms.

MATERIALS

(per group)

- Hand lenses
- Science Notebooks
- Yellow construction paper
- Brown construction paper
- Blue construction paper
- Green construction paper
- Tape
- Stapler
- Scissors
- Markers
- Chart paper



(Food Chain)

http://library.thinkquest.org/J0113170/forest/food.html

PROCEDURES

Lesson One

1. Begin the lesson by taking the students outdoors with their science notebooks and hand lenses. Sit in a location where there are organisms present (birds, insects, plants, etc). Introduce the term **organism.** Ask for examples and have the students list examples in their science notebooks. Tell the students an organism is any living thing, including plants or animals. Instruct the students to observe the life around them using their hand lenses. Ask them to draw pictures and record what they observe in their science notebooks. Tell them to focus on the living things around them and how they are interacting with each other and the non-living factors in the environment.
2. Return to the classroom with the students and gather at the carpet area for a group discussion. What did they notice? Were certain organisms interacting with others? How were they relating to each other? To non-living factors in the environment?
3. Introduce the term **ecosystem**. Tell them an ecosystem is a system of interacting organisms and nonliving factors in a

specified area. Record, on chart paper, any questions that the students have about what they observed outside.

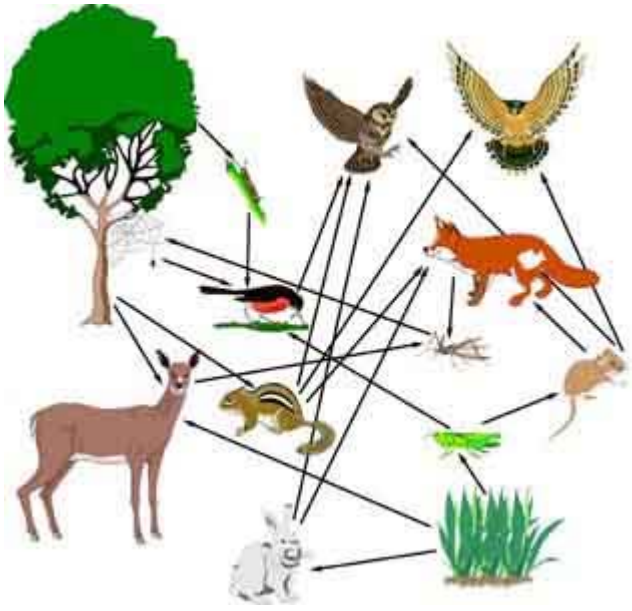
4. Create two lists, one with living factors (**biotic**) and one with non-living factors (**abiotic**) that they observed outside. Ask them if different factors would be found in different ecosystems. Would you find seaweed in a dry desert? Discuss.
5. Call the students to the carpet area and read, "What is a pond ecosystem?" from the Delta Science Reader Food Chains and Webs. Refer back to their charts listing abiotic and biotic factors. Use the pictures of the pond ecosystem to create a new list of living and non-living factors in a pond ecosystem. Discuss the differences and similarities between a pond ecosystem and their ecosystem. Record similarities and differences on chart paper and keep posted next to the charts of biotic and abiotic factors. Review the concept of **environment** with the students.

Lesson Two

1. Invite the students to the carpet area to review ecosystems and the concept of environment. Tell them that today they will be taking a closer look at the relationships organisms have with each other and their environment.
2. Instruct the students to bring their science notebook and hand lens and return to the outside area that you visited yesterday. Tell them to look specifically at the living organisms outside. What do they think they eat? Instruct them to sketch a diagram of the organism they are observing and write or draw what they think they eat from their environment. Observe the organism(s) for 10-20 minutes, recording observations in the science notebook.
3. Gather the students back together inside the classroom at the carpet area and discuss their ideas and observations. Did anyone see the organism(s) eat? What did it eat? What did you think it ate? Chart their responses.
4. Introduce the term **food chain**. Tell the students that the food chain shows how living things get food and energy. Read the next selection from the Delta Science Reader, Food Chains and Webs,

on how living things interact, energy in an ecosystem, and food chains. Discuss the selection and chart their ideas/ further questions.

5. Trace the food chain of one common organism found outdoors…. a raven. Ask for student ideas about the path of energy starting from the sun and ending with the raven. Guide them if they stray from the following food chain:
   Sun → Plant → Insect → Lizard → Raven
6. Introduce the appropriate vocabulary for each step in the food chain. Begin with **producers,** green plants that take in energy from the sun. Next, introduce **consumers**, animals that cannot make their own energy, therefore take it in through eating plants or other animals. Finally, **decomposers**, which are living things that get their energy from breaking down dead organisms. Have them label each organism in the food chain as a producer, consumer, or decomposer.
7. Close the lesson by asking the students to come up with their own food chain using the vocabulary from step 6. Do this as a whole class and chart their responses. **NOTE**: You may want to provide a list of organisms to use in this activity.



(Food Web)

http://carrier.pbwiki.com/Population-Ecology-Bio-2

Lesson Three

1. Begin the lesson by reviewing food chains and asking the students to refer back to the chain from yesterday's lesson:
   Sun → Plant → Insect → Lizard → Raven
   Ask them what they think would happen if you introduce more organisms into the chain. For example, dove, worm, mushroom, etc. Chart their ideas/responses and post.
2. Introduce the term food web. Tell the students that by adding these additional organisms that are also in the ecosystem, they have created a food web.
3. Instruct them to identify the correct placement of organisms in three different food webs. They may work in partners to complete the task. They will be working using an interactive website found at the following address:
   http://www.harcourtschool.com/activity/food/food_menu.html
   Tell them to bring their science notebooks with them to use as a reference and to record any ideas about food webs. Stop them every 10 minutes and give them 2-3 minutes to record in their science notebooks.
4. Close the lesson by reviewing the difference between food chains and food webs.

Lesson Four

1. Invite the students to the carpet area and tell them that today they will be creating a food chain with links for every step in the chain.
2. Instruct students to first create a food chain with at least 3 organisms in the chain. They will then create links out of colored paper to represent each organism.
   Producer = green paper
   Consumer = blue paper
   Decomposer = brown paper
   Sun = yellow paper
   NOTE: Pre-cut the paper into long strips for the students.

3. Once the students have their organisms and paper, they are ready to begin. Instruct them to follow the next series of steps to create a food chain with links.
    1. Write out your food chain with at least 3 organisms (producer, consumer, and decomposer)
    2. Use the following colors to represent the type of organism:
    Producer = green paper
    Consumer = blue paper
    Decomposer = brown paper
    Sun = yellow paper
    3. Begin your food chain with a yellow link representing the primary energy source in all food chains; the Sun. Write SUN on the link before securing it with a staple or tape.
    4. Add a new link to the first yellow link to represent your producer. Before folding the paper in a loop (to make a link) and securing it with a stapler or tape, draw a picture of your organism and label it on the link. See example below.

    5. Repeat with the other corresponding colored paper and organisms in your food chain.
    6. Once complete, you should have a link in your food chain to represent each organism.
4. Once all students are finished, call them to the carpet area to share their food chains with the class. These are a colorful reminder of the transfer of energy in a food chain.
5. Challenge them to add to their food chain to create a food web.

Additional Resources

http://www.sheppardsoftware.com/content/animals/kidscorner/foodchain/producersconsumers.htm
Interactive food chains website.
http://www.sheppardsoftware.com/content/animals/kidscorner/games/foodchaingame.htm
Food chain game.
http://www.ecokids.ca/pub/eco_info/topics/frogs/chain_reaction/index.cfm
Food chain game.
http://www.harcourtschool.com/activity/food/food_menu.html
Interactive food web game.
http://www.picadome.fcps.net/lab/currl/food_chain/default.htm
Information on interactive sites and content about food webs and chains.
Delta Science Readers Food Chains and Webs
ISBN-10: 1-59242-257-8

Vocabulary

Abiotic: Non-living.
Biotic: Living organisms and products of organisms.
Consumer: An organism that eats other organisms.
Decomposer: An organism that feeds on and breaks down dead organisms.
Ecosystem: A system of interacting organisms and nonliving factors in a specified area.
Environment: Everything that surrounds and influences an organism.
Environmental factor: One part of the environment. An environmental factor can be nonliving, such as water, light, temperature, or chemicals, or living, such as a plant or an animal.
Food chain: A sequence of organisms that eat one another in an ecosystem.
Food web: All the feeding relationships in an ecosystem.
Herbivore: An organism that eats only plants.
Omnivore: A consumer that eat both plants and animals.

Organism: Any living thing, including all plants and animals.
Producer: An organism that is able to produce its own food through photosynthesis.
Thrive: To grow and be healthy.
Variable: Something that can be changed.

Safety Reminder
Students must wash their hands after handling any organism.

Nevada State Science Standards
L5C1 Students know the organization of simple food webs. E/S
L5C2 Students know organisms interact with each other and with the non-living parts of their ecosystem. E/S
L5C3 Students know changes to an environment can be beneficial or detrimental to different organisms. E/S
L5C4 Students know all organisms, including humans, can cause changes in their environments. E/S
L5D1 Students know animals and plants can be classified according to their observable characteristics. E/S
N5A1 Students know scientific progress is made by conducting careful investigations, recording data, and communicating the results in an accurate method. E/S
N5B3 Students know the benefits of working with a team and sharing findings. E/L