

WHO IS IT FOR?

- ◆ Young Scientists . . .
- ◆ Evolving Mathematicians . . .
- ◆ Emerging Linguists . . .
- ◆ Sprouting Historians . . .
- ◆ Budding Artists . . .

TARGETED LEVEL:
(Fourth Grade)

THE CHALLENGE:

The students will . . .

- ⇒ begin to develop an understanding of how energy flows through an ecosystem.
- ⇒ begin to develop an understanding of some of the relationships between various organisms.
- ⇒ construct reasonable explanations and draw conclusions using given information and prior knowledge.
- ⇒ be able to demonstrate relationships through line drawings.

SAFETY ISSUES & CONCERNS:

- * Students need to demonstrate care with sharp objects.

WHAT'CHA NEED?

1. Large sheet of butcher paper, at least 6 feet in length.
2. Colored pencils and/or markers.
3. Chalkboard or overhead projector.

TIME NEEDED FOR the pre-visit activity:

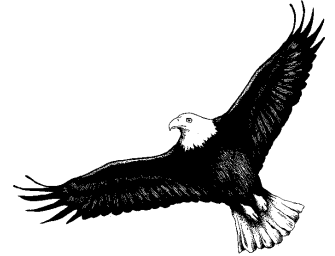
Minimum of 45 minutes.

Food for Thought!



Pre-Visit Activity

Every living thing must consume food in order to create energy. Humans eat vegetables, hamburgers, potatoes, etc. in order to obtain the energy necessary to sustain life. If we did not eat, we would not have the energy to perform even the most basic of functions, like breathing, for instance. Other organisms, too, must have energy to survive. Some organisms are able to consume their energy directly from the sun; these organisms, usually plants and some types of bacteria, are known as primary producers. The animals and/or plants that eat these primary producers are called consumers. Consumers obtain their energy second hand by consuming either dead or living organic matter that was produced by the primary consumers or green plants. Other terms that relate to these organisms are herbivore, carnivore, and omnivore. An herbivore is a consumer of plants, a carnivore is a consumer of the flesh of other animals, and an omnivore consumes a variety of both plants and animals. All of the organisms that fit into these categories however are consumers. The differences between them lie in what they consume! In other words, as an organism eats a plant that organism is able to take in a percentage of the energy that the plant had produced by its interaction with the sun through the process known as photosynthesis. If another organism then eats that organism, a smaller percentage of that original energy is again transferred to this new consumer. If this consumer is then eaten, an even smaller portion of the original energy is transferred and so on. This transferring of energy from one organism to another is called a food chain and is the means by which energy is able to flow through an ecosystem. An example of a food chain could be:



Second order carnivore - Eagle

First order carnivore - Trout

Herbivore - black fly larvae

Primary producer - algae

In this *pre-visit* activity, the students will focus on understanding the relationships between the various organisms that form a food chain.



WORDS TO KNOW?

1. Carnivore
2. Consumer
3. Ecosystem
4. Food chain
5. Food web
6. Herbivore
7. Heterotrophs
8. Omnivore
9. Producer

DID YOU KNOW . . .

Consumers are heterotrophs?

Scavengers are omnivores?

The further you go up the food chain there is less energy actually available for the consumer to use?

Photosynthesis is the only means by which living organic material can be created by the sun?

EXTRA STUFF?

Related books/stories and on-line sources:
Caduto, Michael J., *Pond and Brook*, 1990.
University Press of England, Hanover, NH.

Shinkle, Jill, *Creek Watchers*. University of California, Santa Barbara, CA.

River Cutters, Great Explorations in Math and Science (GEMS). Lawrence Hall of Science, University of California, Berkeley, CA.

TEKS

CONNECTIONS:

Science TEKS - Fourth Grade:

4.8 (A) - Students will identify characteristics that allow members within a species to survive and reproduce.

4.2 (E) – The students will identify the Sun as the major source of energy for the Earth and understand its role in the growth of plants, in the creation of winds, and in the water cycle.

Denton ISD Science S.P.O. Fourth Grade:

S6.4 - The student will analyze and describe adaptive characteristics that result in an organism's unique niche in an ecosystem and that are required for survival and reproduction.

PROCEDURES:



Ready, Set, Go . . .

1. Introduce the concept of a food chain to the students.
2. Ask the students to name those organisms that they believe are herbivores, carnivores, or omnivores. Keep a list of these on the board.
3. Ask the students to describe a *producer*? A *consumer*?
4. Ask the students, of the items they listed above, which ones can produce their own food for energy and which ones must eat another organism in order to obtain energy?
5. As the students call out which is which, begin to draw lines between the organisms, linking the organisms.
6. As the discussion begins to come to a close, ask the students to narrow their selections on the board down to just one single food chain. (See example on first page)
7. Provide the students with a very large piece of butcher paper and discuss with them the idea of creating a mural of the food chain they have chosen.
8. Ask the students to work cooperatively in the creation of the class mural.
9. Ask the students to sketch their food chain on the butcher paper, making sure to draw lines connecting the organisms together in their proper order in the food chain.
10. *When the outline has been drawn, double check with the students to be certain that their food chain is accurate.*
11. Provide colored pencils and markers for the students so that they can artistically complete their mural.
12. Hang the mural in the classroom.
13. Discuss with the students the fact that they will soon be coming to the Elm Fork Education Center (EFEC). Once there, they will be continuing their study of food chain relationships.

Assessment:

Teacher observation
Class mural

The Bottom Line: Organisms need energy to survive, and they get this energy either directly from the sun or indirectly by consuming other organisms.