

Food Chain Gangs

Student Objective

The student:

- given a list of plant and animal species will be able to put them into food chains
- given a food chain will be able to explain the relationship between the members
- given an ‘interrupter’ of a food chain (such as insecticide or extinction) will be able to explain the effect on the other members of the chain.

Key Words:

extinction
food chain
insecticide
interdependent
pollution
trophic

Time:

1 hour

Materials:

- Food Chain Cards (enough cards to give five to each student)
- Science Journal

Background Information

A food chain can be described as a transfer of energy from one organism to another. The original source of energy for all of the Earth is the Sun. This means that all food chains must start with the Sun. Only plants can convert sunlight into food, and the herbivore that consumes the plants gets its energy from the Sun through the plant. The carnivore in turn receives the Sun's energy from eating the herbivore.

A food chain can be diagramed. For example:

Sun ----> grass seeds ----> mouse ----> owl

Each animal and plant can be thought of as a link in a chain. The Sun is not usually included in the food chain diagram because it is assumed that we know the Sun is in every food chain.

Food chains only show one possible source of food for the animal. A better way of seeing what an animal eats is to construct a food web. A food web describes all the relationships of one animal or plant to the other members of the community. Most plants and animals are members of many different food chains. The animal eats a variety of different foods, but it is being preyed on by a number of predators. The food web allows us to trace these different food chains and to see how each chain is related to all the other food chains.

Procedure

1. Discuss food chains with students. Do an example on the board, and discuss what type of energy each member of the sample food chain eats, and where that energy (food) came from.
2. Distribute one Food Chain Card to each student. Instruct the students to find the other members of their food chain and line up in order, **WITHOUT SPEAKING**. At this time, there should be five students to each food chain, and each chain should begin with the Sun.
3. Once everyone has found their place, each person shares what they are, and how they fit or don't fit in their food chain.
4. Collect all the Food Chain Cards. Randomly pass out 5 cards to every student. (This is where you will use the extra cards you have copied.) Have them make a food chain if possible, out of their 5 cards. Food chains do not have to use all 5 cards.
5. Have students pair up with a partner. Using their 10 cards, have the students construct as many different food chains as possible.
6. Students should complete questions 1-3 in their Science Journal while working with their food chain cards.
7. As a class, figure out a food chain you might be able to have in the classroom.
8. Discuss with the class what would happen if the number of members of one species was severely reduced. What would happen if the amount of sunshine was severely reduced?

Further Research

1. Where does your food come from? Trace your lunch back to the origins of its component parts (and ultimately the sun!).
2. What eats this plant? Pick one plant and list every animal that might use it for food.
3. Play Food Chain Tag (requires a large field):
 - In a class of 25 - 40, choose three to five students to be predators and seven to 10 to be plant-eaters. The remainder will be plants. This represents a balanced system where plants are more plentiful than plant-eaters, plant-eaters more plentiful than predators. The students can select which plant-eaters and predators will be in their groups (e.g. deer are plant-eaters and cougars are predators).
 - Each group selects hand-signals that will differentiate them from the other groups. E.g. the plants may want to hold their hands out to their sides to represent leaves, the plant-eaters (deer) may hold their hands on their heads to represent antlers and the predators (cougars) may hold their hands up like paws with the claws showing.
 - The predators try to tag the plant-eaters who try to tag the plants. Since predators decompose when they die and become fertilizer, the plants try to tag the predators. Once you are tagged, you turn into whatever tagged you. After a period of time, stop the game and see how many plants, plant-eaters and predators are left. Play should resume but should be stopped a few times before the end to determine what has happened and why.
 - After playing a few rounds of the game, select one of the plants to re-enter the game as a human. The rules for the human are different - the human can tag

anyone, but no one can tag the human. Each time the human tags someone, they become another human. See how long it takes before all players have been changed into humans.

- End with a discussion. Some questions might include: What happens to the plants and plant-eaters if many of the predators have been caught? What happens to the plants if many of them have been caught? What happens when humans use too much of the food chain? How can we keep that from happening? Ask students to record what happened in their science notebooks, including an illustration of the food chain they represented.

Related Reading

- ***Pass the Energy, Please!*** by Barbara Shaw McKinney and Chad Wallace (Dawn Publications, 2000)
Each of nature's creatures "passes the energy" in its own unique way. In this upbeat rhyming story, the food chain connects herbivores, carnivores, insects and plants together in a fascinating circle of players. All beings on Earth - from the anchovy to the zooplankton - depend upon the green plant, which is the hero of the story.
- ***The Magic School Bus Gets Eaten: A Book About Food Chains*** by Pat Relf and Carolyn Bracken
The Magic School Bus Gets Eaten is no exception presents concepts of food chains simply but clearly and readers are led to make deductions based on previous information.

Internet Sites

http://www.ecokidsonline.com/pub/eco_info/topics/frogs/chain_reaction/index.cfm#
Earth Day Canada, Eco-Kids. Interactive food chain game

http://www.gould.edu.au/foodwebs/kids_web.htm
The Gould League. Interactive games--matching the animal with its place in the foodchain 'solve a mystery' of who eats what

http://www.harcourtschool.com/activity/food/food_menu.html
Harcourt School Publishers. Fun With Food Webs, interactive game of matching animals to their position in one of three food webs

<http://magma.nationalgeographic.com/ngexplorer/0309/quickflicks/>
National Geographic Kids and BrainPop. A website with a short animated video explaining food chains.

EnergyWhiz

Draw a picture of a food chain, either one from your classroom or a new one you make up. Include arrows showing the direction that the energy flows through the food chain. Submit your picture to <http://energywhiz.com/>. If your picture is posted on the website, we'll send you an EnergyWhiz t-shirt.

Food Chain Gangs

			.1	.2	.3	.4	.5	.6
Energy	Standard 1	SC.B.1.2-	X			X		
	Standard 2	SC.B.2.2-	X					
Processes that Shape the Earth	Standard 1	SC.D.1.2-						
	Standard 2	SC.D.2.2-	X					
Processes of Life	Standard 1	SC.F.1.2-		X				
	Standard 2	SC.F.2.2-						
How Living Things Interact With Their Environment	Standard 1	SC.G.1.2-	X					
	Standard 2	SC.G.2.2-		X				

Benchmark SC.B.1.2.1 - The student knows how to trace the flow of energy in a system.

Grade Level Expectations

The student:

Fourth

- knows that most living things use energy from the Sun to live and grow
- knows how to trace the flow of energy in a system

Fifth

- knows how to trace the flow of energy in a system.

Benchmark SC.B.1.2.4 - The student knows that many ways in which energy can be transformed from one type to another.

Grade Level Expectations

The student:

Fourth

- knows ways that energy can be transformed.

Benchmark SC.B.2.2.1: The student knows that some source of energy is needed for organisms to stay alive and grow.

Grade Level Expectations

The student:

Third

- knows that some source of energy is needed for organisms to stay alive and grow.

Benchmark SC.D.2.2.1 The student knows that recycling, and reducing the use of natural resources improve and protect the quality of life.

Grade Level Expectations

The student:

Fourth

- knows ways in which people can conserve natural resources
- knows ways misuse of natural resources affects the quality of life for all species.

Benchmark SC.F.1.2.2: The student knows how all animals depend on plants.

Grade Level Expectations

The student:

Third

- understands the various ways that animals depend on plants for survival.

Benchmark SC.G.1.2.1: The student knows ways that plants, animals, and protists interact.

Grade Level Expectations

The student:

Fourth

- knows how plants and animals interact with one another in an ecosystem
- understands the relationship among organisms in aquatic and terrestrial food chains

Fifth

- understands the various roles of single-celled organisms in the environment
- knows ways in which protists interact with plants and animals in the environment.

Benchmark SC.G.2.2.2: The student knows that the size of a population is dependent upon the available resources within its community.

Grade Level Expectations

The student:

Third

- knows that the size of a population is dependent upon the available resources within its community.

Food Chain Gangs

extinction - no longer in existence; the act of putting an end to, putting out, or destroying

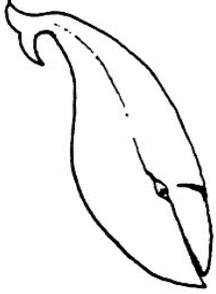
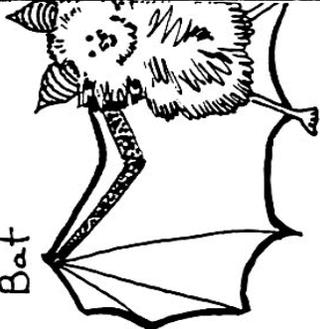
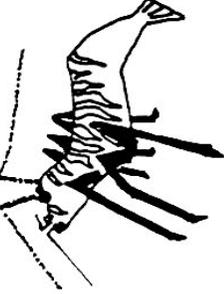
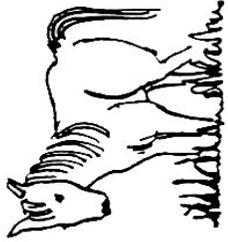
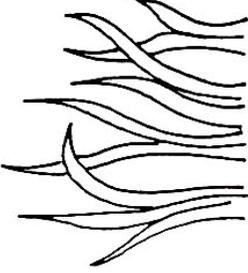
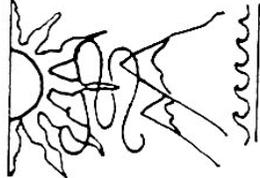
food chain - a succession of organisms in an ecological community that constitutes a continuation of food energy from one organism to another as each consumes a lower member and in turn is preyed upon by a higher member

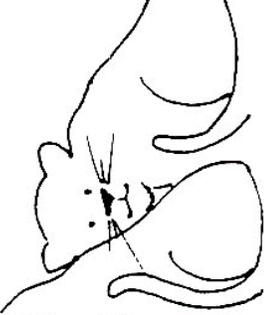
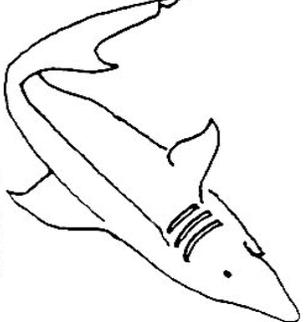
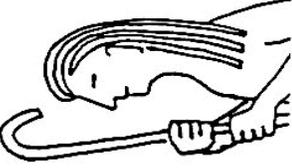
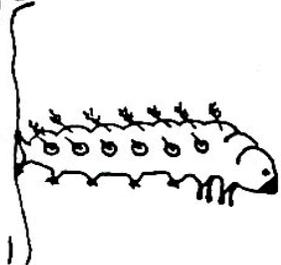
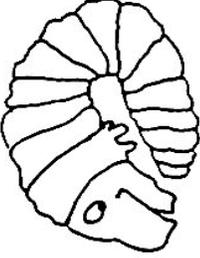
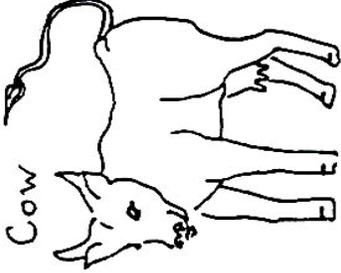
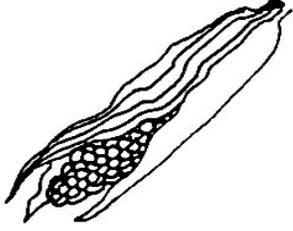
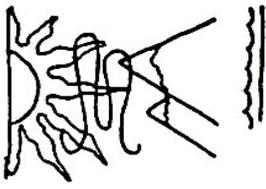
insecticide - a substance that kills insects, which can also be toxic to humans and other animals

interdependent - mutually dependent

pollution - the contamination of soil, water, or the atmosphere by the discharge of unwanted or harmful substances

trophic - of or involving the feeding habits or food relationships of different organisms in a food chain

<p>Whale</p> 	<p>Bat</p> 	<p>Coyote</p> 
<p>Fish</p> 	<p>Mosquito</p> 	<p>Rat</p> 
<p>Shrimp</p> 	<p>Horse</p> 	<p>Grasshopper</p> 
<p>Phytoplankton</p> 	<p>Grass</p> 	<p>Wheat</p> 
<p>Sun Air Soil Water</p> 	<p>Sun Air Soil Water</p> 	<p>Sun Air Soil Water</p> 

<p>Hawk</p> 	<p>Mountain Lion</p> 	<p>Shark</p> 
<p>Bird</p> 	<p>Raccoon</p> 	<p>Human</p> 
<p>Caterpillar</p> 	<p>Grubs</p> 	<p>Cow</p> 
<p>Leaves</p> 	<p>Plants</p> 	<p>Corn</p> 
 <p>Sun Air Soil Water</p>	 <p>Sun Air Soil Water</p>	 <p>Sun Air Soil Water</p>

Food Chain Gangs

1. List the food chain that your group made when you were given your first food chain card.

2. How many food chains could you and your partner put together when you each had five food chain cards? _____

3. List the food chain that you feel was the best one. _____

4. Explain a food chain using yourself and your lunch in the chain. _____

5. What happens to the rest of the chain if insecticides, pollution, or extinction wipes out one 'link' of the chain? _____
