

# International Snow Leopard Trust

## The Food Chain Game – a lesson in ecosystems

*By Julie Taylor, Education Intern*

**Goal:** For students to have an understanding of how a food chain functions within an ecosystem and be able to describe each organisms role as part of an interconnected system.

**Overview:** The “Food Chain” game is created by dividing the players into various categories – herbivores (primary consumers), omnivores (secondary consumers), and carnivores (tertiary consumers). Each category is given a certain number of lives: 9 lives for herbivores, 6 lives of omnivores, and 3 lives for carnivores. Once in your ecosystem (the playfield or gym), the carnivores chase and eat a life from either an omnivore or a herbivore, the omnivores can eat a herbivore but must also find food, and a herbivore is just constantly running for its life and having to find food for survival. Each player runs around until his/her lives are exhausted. There are no winners or losers, just survivors.

**Grade Level:** 3 – 6

**Group size:** whole class activity

**Subjects:** Biology, Communication, Ecology, Physical Education

**Time:** 60 – 90 minutes (over 2 days)

**Materials:**

- ✓ The entire class
- ✓ A large playfield or gym
- ✓ Headbands or waistbands to denote the player’s role (green, white, red, black and blue)
- ✓ Tags to denote each player’s number of lives made out of construction paper matching their role’s coloring
- ✓ One “survival” card for each player (a stiff piece of cardboard works well)
- ✓ Ink pads and stamps for “survival needs” – vegetation, water, and shelter – enough to make 3 “survival stations” each with 3-4 stamps per need
- ✓ 2 bean bags
- ✓ Yarn or string for tags

**Vocabulary:** *food chain, trophic level, producer, consumer, primary consumer, herbivore, secondary consumer, omnivore, tertiary consumer, carnivore, photosynthesis, energy*



4649 Sunnyside Avenue N., Suite 325 Seattle, WA 98103 USA

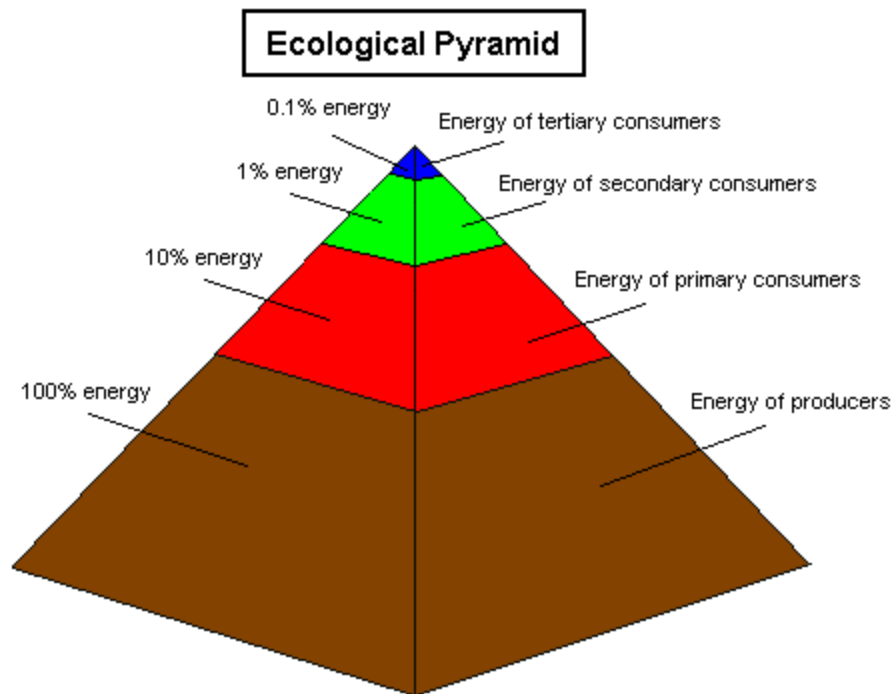
(206) 632-2421

[www.snowleopard.org](http://www.snowleopard.org)

(Before playing the game, the students must have an understanding of a basic food chain and its associated trophic levels.)

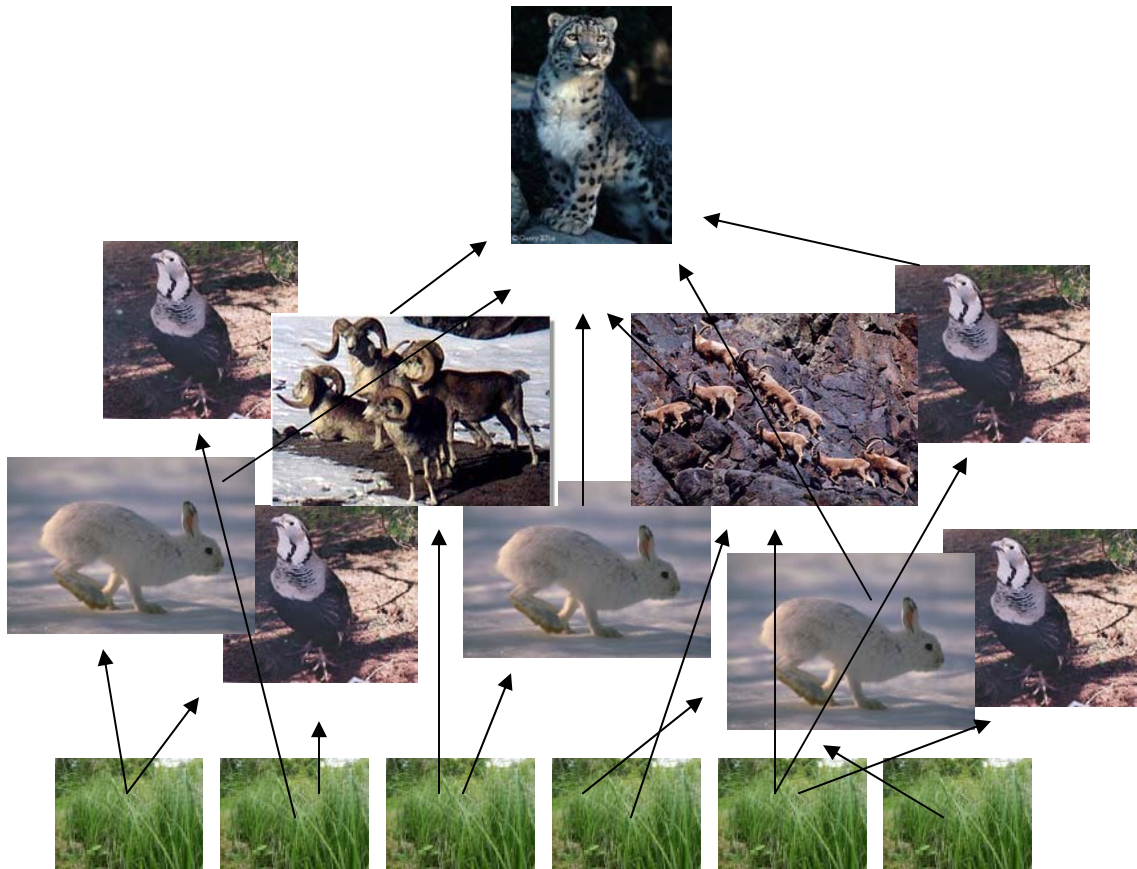
1. Ask the students “*what sustains life?*”  
Energy is what sustains life and it is the flow of this energy through an ecosystem that will be studied in the game. Within an ecosystem, there are basically two types of organisms – *producers* (the organisms that produce energy) and *consumers* (the organisms that consume energy).
2. Ask the students “*what are sources of energy?*”  
Here on earth, the main sources of energy are the sun, plants, and animals.

Plants get their energy from the sun through a process called *photosynthesis*. The *herbivores* get their energy from the energy stored in the plants. *Omnivores* get their energy from the energy stored in both the plants and the animals that they eat and *carnivores* get their energy from the energy stored in the animals that they eat. This transfer of energy from one organism to another is known as an *Ecological or Trophic Level Pyramid*. Plants form the base of the pyramid (*producers*). Above the plants are the herbivores (*primary consumers*), the omnivores (*secondary consumers*), and at the top of the pyramid are the carnivores (*tertiary consumers*). As you move up the pyramid, a large amount of energy is lost to the environment. This loss of energy is due to the fact that when energy changes forms some of it is lost in the process, because animals use the energy for keeping warm and moving. The most energy efficient organisms are those that get their energy directly from the sun (plants) and the least energy efficient are the carnivores who get their energy filtered through the plants and herbivores.



Pyramid courtesy of Arcytech.com

The day before playing the game have the students create their own food chain based on what you have discussed in class. Encourage your students to be creative – they can draw pictures or find ones in magazines or on the Internet. Have them be able to demonstrate that they understand that an ecosystem needs many producers and primary consumers to allow for the survival of just one carnivore. Their food chain could look something like this:



## Now for the game!!!

### How to play the game:

The game should last about 15-30 minutes. Each player is assigned a role in the ecosystem. There are three animal categories: herbivore, omnivore, and carnivore. Each category is given a certain number of lives: 9 lives for an herbivore, 6 lives for an omnivore, and 3 lives for a carnivore. Tags are the same color as the player's role and are worn on a piece of yarn. To make the ecosystem more complete, a human, disease and natural disaster are included. To distinguish between each member of the food chain, players will be given a specific colored headband or waistband. The herbivores will wear green, the omnivores white, the carnivores red, disease and natural disaster are blue, and the human is black. For a class of 30 Players, there would be:

1 Human	1 Disease
1 Natural Disaster	2 Carnivores
4 Omnivores	21 Herbivores

Hidden in the field or gym are three types of stations: vegetation (food), shelter, and water. All the animals need to find the shelter and water stations to survive. But the herbivores and the omnivores also need to find vegetation. These stations consist of an ink pad and 3-4 stamps which the animals use to stamp their survival card.

To begin the game every animal player is given a headband, "lives" tags, and a survival card. The players that represent disease and natural disaster only get a bean bag. The player that represents the human gets "lives" tags that they can use to replenish another player's life. The herbivores are let to roam first, then the omnivores, followed by the carnivores, and finally disease, natural disaster, and the human.

Herbivores must always be looking for vegetation, water, and shelter and stamp their survival cards to show that they received them. Omnivores can get "life" tags only from herbivores while they still need to search for vegetation, water, and shelter for their cards. Carnivores can get "life" tags from either herbivores or omnivores but must also have stamps on their survival card for water and shelter. Disease can victimize any of the animals by throwing the bean bag at them. If it hits them, this takes 1 life tag. Natural disaster can also victimize any of the animals by throwing the bean bag at them. If it hits them, this takes 2 life tags. The human just has to tag any player in the game (including disease and natural disaster) and can do anything they want. For example, the human could terminate the player's existence (taking all of their lives or eradicating disease) or replenish them with new lives (they must have at least 1 life tag left in order to receive additional lives). When a player has been "tagged" by its predator, he/she must surrender a "life" tag. The predator must then wait 30 seconds before they may catch the same or another victim. A player can be tagged anywhere on the field, even when they are getting a stamp for their survival card. Once a player has lost all of their lives, they must sit

down and wait for the game to end. The animal categories with players remaining must show that they still have lives left and have gotten stamps at each of the 3 survival stations.

### **Discussion:**

Discuss with the students how there are no winners and losers in this game. The players that survived carry on their species survival and the balance of the ecosystem. Through this game the students will have learned that all of the animals depend on both each other for survival and the environment around them. Together they form an ecosystem and their interactions keep the energy flowing through the ecosystem, keeping it in balance.

Stimulate a discussion on how the human interacted in the food chain. Have the students think of a variety of ways in which humans influence the environment. For example, humans have been causing pollution and destroying the natural balance of ecosystems, thereby causing other living things who live in the area to suffer. Discuss how these changes in the environment may kill certain plant and animal species. For example, discuss what would happen if a certain species of plant disappeared (went extinct). What would happen to the herbivore that depended on the plant for survival? What would happen to the carnivore that depended on that herbivore for survival? Within the mountains of Central Asia, humans are encroaching on the territory of the snow leopard as they bring their herds of sheep and goats higher into the mountains to graze. They are building villages and developing land for farming, causing flooding and erosion. Cars and factories around the world are polluting the air, changing the climate so that mountain ecosystems are altered. These impacts are reducing the number of prey species for the already endangered snow leopard. How is this situation similar to the game?

Variations to this game could stimulate further discussion ideas. By limiting the amount of stamps at the “water station,” the game could be made to reflect a drought. By limiting the amount of stamps at the “vegetation station,” the game could be made to reflect a shortage of food. Discuss with the students how the limitation of these resources could affect the populations of all types of consumers.