



The Web of Life

Life Skills:

Communication, Decision Making

What To Do:

By assuming the roles of different animals and habitat components, youths will investigate the importance of nature's balance.

Measuring Success:

Youths will be able to identify and understand why populations change over time and what factors affect them.

Audience:

2nd - 6th grades

Time Involved:

30 minutes per activity. Could expand by encouraging youths to complete further research.

Group Size:

15 - 30

Preparation and Materials:

- Sandwich bags with a piece of tape about 1/2 inch from the top
- Popcorn (about 3-4 grocery bags full)
- Strips of fabric (each young person should have one piece and the color should be unlike anyone else's; this can be any material and should be about 8 inches long and about 4 inches wide)
- Pictures or photographs (can be from magazines) of hawks, frogs and grasshoppers laminated onto construction paper. Tie yarn or string to the top so the picture can loosely hang around a person's neck.
- A large space, either outdoors or in a gym, is needed

Introduction

Many factors affect the ability of a population to successfully reproduce and maintain its numbers over time. Disease, predator/prey relationships, weather conditions, accidents and human influence (such as environmental pollution, habitat destruction, fragmentation, hunting, etc.) are just some factors. Often we think that only animal populations are affected, but plants, insects and microscopic organisms are a part of our world's ecosystem. When one component of a habitat is changed, this change affects every other living thing in the habitat as well.

Let's investigate food chains by assuming the roles of plants and animals in a food chain.

The Activity

We're going to simulate a food chain using hawks, frogs and grasshoppers. What do hawks eat? (frogs) What do frogs eat? (grasshoppers) What do grasshoppers eat? (grass and plants) For this activity, each of you will be a hawk, frog or grasshopper. We'll use popcorn to represent grasshopper food.

(Choose one person to be the "hawk." Choose five to eight youths to be "frogs." The rest of the youths are "grasshoppers." Hang the pictures of each animal on the respective children.)

This activity can be modified for use with older students. You might add more species, i.e., several types of hawks, mice, rabbits, insects, snakes, etc., and several types of plants eaten by grasshoppers.

Directions:

I'm going to give a fabric strip to each grasshopper and frog. They'll need to place one end in their back pocket with about 6 inches sticking out. Now, for a hawk or frog to "eat," it must pull the cloth strip off of a frog or grasshopper. Once the frogs or grasshoppers lose their fabric strips, they're out of the game. Frogs can return to home base only after they have eaten two grasshoppers. For the grasshoppers to "eat," they must fill a plastic sandwich bag up to the taped "full" mark with popcorn. Once the grasshoppers fill the bag, they can return to their home base for safety. A hawk must have fabric strips from at least three frogs to survive.

(Establish boundaries and home bases for each animal. Scatter the popcorn all around the area.)

To start:

OK! Go to your home base. Everyone ready? Now, we're going to let the grasshoppers move away from home base and get a head start. *(Give them a chance to get a 5-10 second head start.)* OK, frogs! Now you're loose, too! *(Wait another 5-10 seconds.)* OK, now the hawks can join in! *(After the majority of the grasshoppers and frogs have been eaten, the round ends.)*

Reflect/Discuss

Share what You did

(Record how many grasshoppers, frogs and hawks are alive at the beginning and end of each round. A grasshopper survives a round only if it has a full bag of popcorn and the fabric strip. A frog survives only if it has two grasshopper fabric strips. A hawk survives if it has fabric strips from at least three frogs.)

Tell What's Important

Why are there so many more grasshoppers than frogs and hawks? (Reinforce the food chain and the ecosystem pyramid concept here. Explain that at least two grasshoppers, two frogs and one hawk must be alive at the end of a round to have a "balanced" food chain.)

Generalize to Your Life

What population sizes of grasshoppers, frogs and hawks produced a balanced food chain? What happens when there is too much of one organism? What might happen if there were only half as many plants? No plants? What might happen to the plant population if there were no frogs? What are some food chains that include humans? Why do some organisms or animals leave home? Why do people move or leave their homeland?

Apply What You Learned

For a group discussion, consider asking processing questions such as: What can we do to help balance the food chain? How can we change the game to produce a balanced food chain? *(Answers may be to change the number of grasshoppers, frogs and hawks at the beginning of the game; provide more plants (popcorn); or set up more safety zones for grasshoppers and frogs).* Other types of processing would include writing and/or drawing pictures of what happened, relating the activity to real life situations, etc.

(At the beginning of each new round, return the popcorn to the area, and if necessary reassign roles. All animals play again each round. Helpful hints: To slow the pace of each round, have youths walk instead of run. Make sure boundaries are well-marked. If a young person runs out of bounds s/he is out of the round.)

More Challenges

- Look for evidence of plants being eaten at the activity site. What animals are responsible? (Don't forget that insects are animals.)
- Find three possible links in a food chain at the activity site.
- Play new versions of the game and include new organisms (e.g., people, scavengers, decomposers) or include the effects of various factors (pesticides, a sudden population explosion, and a drought). To do this, color some of the popcorn to represent pesticide-laden food. Three-colored pieces may be fatal to grasshoppers.