Big Fish, Little Fish

Alabama Outdoor Classroom Activity

Grade Levels
3-12

Overview
This activity highlights the predator (bigmouth bass) and prey (sunfish) relationship that exists in an aquatic ecosystem such as a pond. It will also demonstrate the energy flow in a pond and how the fish population can be affected if it gets out of balance.

Duration
20-45 minutes

Subject Areas
Biology & Environmental Sciences

Vocabulary
Predator, Prey, Limiting Factor, Energy Flow, Food Chain

Learning Objectives
Students will: 1) discuss how adaptations are a part of predator/prey relationships; 2) how animal populations are affected by limiting factors; and 3) how the flow of energy takes place in a food chain.

Alabama Course of Study Objective Correlations for Science
Third: 10
Fourth: 5, 6
Fifth: 9
Seventh: 1, 4, & 7
High School Biology: 12, 13 & 16

Materials
- Food Tokens (poker chips or pieces of cardboard work well)
- Orange vests for the bass or some other way distinguishing predators from the prey

This activity was adapted from the Quick Frozen Critter activity in Project WILD.

Background Info

Animals, including fish, display a variety of behaviors that are related to the predator/prey relationship. These behaviors or adaptations are related to the instinct of survival. Some of these prey behaviors include "freezing", fleeing for cover, schooling, and facing the predator in a defensive or fighting posture.

The kind of behavior exhibited by the prey partly depends on the closeness of the predator. If the predator is at a distance, then the prey may signal other fish that danger is near and keep it under observation. If the predator comes closer, the prey may flee and/or look for an area of safety such as an underwater structure (downed tree, rock pile, underwater vegetation, etc.) that provides shelter. If it gets too close, the prey may just freeze, hoping that their camouflage will conceal them from the predator.

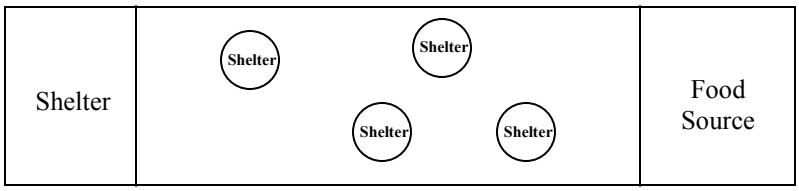
The main purpose of this activity is for the students to understand the importance of adaptations to both predators and prey as well as to develop an understanding of concepts such as limiting factors, predator/prey relationships and food chains.

Preparation

Gather your materials including the food tokens and a way to identify predators (orange vests, or hats work great). Discuss the concept of limiting factors, predators, prey, food chains and energy flow.

Procedure

1. Identify the students as either sunfish (prey) or bass (predator) for a version of "freeze tag".
2. Using a large playing area such as a playing field or gymnasium, mark one end of the playing area as the "food source" and the other end as the "shelter".



3. Randomly place four to five hula hoops on the open area between the two ends. The hoops will represent underwater structures (old stumps, piles of rock, dead trees, and submerged aquatic plants) which will provide additional shelter areas for the prey.
4. Place the food tokens in the "food source" area. Allow three tokens for each prey animal.
5. Have the prey line up inside the shelter area and have the predator move onto the playing field. The predators should be clearly identified by making them wear orange vests, hats or by some other means.

Procedure continued on Page 2…

Big Fish Little Fish

Alabama Outdoor Classroom Activity

Grade Levels
3-12

Alabama Course of Study Objective Correlations for Science
Third: 10
Fourth: 5, 6
Fifth: 9
Seventh: 1, 4, & 7
High School Biology: 12, 13 & 16

Outdoor Classroom Connection
Students can relate the predator/prey relationship and limiting factors concepts to animal populations within the outdoor classroom.

Fish Field Guides
⇒ *Fishes of Alabama* by Herbert Boschung, Richard Mayden, and Joseph Tomelleri (ISBN: 10-158834004X)
⇒ *National Audubon Society Field Guide to Southeast United States* (ISBN-10: 0679446834)

Other Related Conservation Education Activities

Project Learning Tree
⇒ *Birds and Worms*

Project Aquatic WILD
⇒ *Marsh Munchers*

Discovering Alabama Videos
⇒ *Alabama's Natural Diversity*
⇒ *Alabama Rivers*
⇒ *Mobile River Basin*

Procedure continued…

6. To begin the activity, decide on the length of time that a round will last (five to seven minutes should be adequate) and then use a whistle or some other means by which to signal start. When the round begins, the prey fish will move from the shelter end of the playing field and attempt to move to the food source, collecting one food token before they return to the shelter end. To survive the round, each prey fish will need to make a total of three round-trips, collecting only one food token per trip for a total of three food tokens.

7. This activity is not hazardous free for the prey as there maybe predators in the area. If they spot a predator, they can use various prey behaviors to avoid capture. They may warn other prey that a predator is near. They may also avoid being caught by doing either of the following:
a) they may "freeze" when a predator is within five feet of them, or
b) they may flee to cover by standing with at least one foot inside a hula hoop which will serve as a temporary shelter. If they choose to freeze, blinking is allowed but they may not move or talk until they are ready to continue on with the game. If they fail to collect three food tokens before time is up, they will not survive the round.

8. Predators may start the activity anywhere in the area located between the permanent shelter and the food source areas. The predators will attempt to capture the prey as they also need to find food if they are going to survive. The predators will need to tag the moving prey to initiate capture. Prey that are "frozen", in the food source area, standing with one foot in a hula hoop, or in the shelter end of the activity area are safe from capture. Once a predator has successfully tagged one of the prey, the predator must escort the prey over to the sideline area where the prey species must remain during the rest of the round. Once the prey has been delivered to the holding area, the predator may return to the activity and continue looking for more prey. For a predator to survive, they must capture a total of two prey during the round.

   **NOTE: Establish rules on how the predator and prey should behave when fleeing and tagging so that their behavior is not harmful to one another.*

9. Emphasize to the prey that if they choose to stay in a shelter area or remain "frozen" for long periods of time, they will not survive (starve to death) if they do not collect the required number of food tokens before time runs out. The same goes for the predator. If the predator becomes fixated on catching one specific prey, then time will run out before they are able to catch enough prey to meet its needs. Explain that in nature, an animal must balance the need to find food with the need to be safe.

Procedure continued on Page 3…

Big Fish Little Fish

Alabama Outdoor Classroom Activity

Grade Levels
3-12

Overview
This activity highlights the predator (bigmouth bass) and prey (sunfish) relationship that exists in an aquatic ecosystem such as a pond. It will also demonstrate the energy flow in a pond and how the fish population can be affected if it gets out of balance.

Vocabulary
Predator, Prey, Limiting Factor, Energy Flow, Food Chain

Subject Areas
Biology and Environmental Sciences

Duration
20-45 minutes

Learning Objectives
Students will: 1) discuss how adaptations are a part of predator/ prey relationships; 2) how animal populations are affected by limiting factors; and 3) how the flow of energy takes place in a food chain.

Outdoor Classroom Connection
Students can relate the predator/prey relationship and limiting factors concepts to animal populations within the outdoor classroom.

10. Play several rounds, allowing every student to have a chance at being the prey and predator, if possible. Discuss with the students the ways they as prey escaped the predator. What ways worked best? What means did the predator use to catch prey successfully? What worked best and what didn't work? Have the student summarize what they learned about the predator/ prey relationship. How does this relationship serve as a limiting factor for wildlife?

Variations

Rather than starting each round with the same number of predators and prey, have the students who are captured as prey each time become pred- ators along with the predators that acquired enough food each time. If a predator doesn't get enough food to survive, it becomes prey during the next round. This change will help the students to understand carrying capacity and dynamic balance as the predator and prey populations change.

Extensions

Select an animal native to Alabama and research how its behavior patterns enable it to avoid detection or capture or enable it to prey on other animals.

Assessment

1. Choose any predator and prey pair and describe each animals adaptation. Examples: Fox and coyote OR blue heron and bullfrog
2. Explain why adaptation is important in predator and prey relationships and have the students give examples. How role does this relationship play in limiting wildlife populations.
3. Create your own imaginary animal and give it some type of adaptation that enables it to escape from a predator or capture its prey.

   *Note: *Fashion a Fish* in **Aquatic WILD** and *Adaptation Artistry* in **Project WILD** are both activities that have students create imaginary animals.

Literature Connection

Swimmy by Leo Lionni - This book is about a little fish named Swimmy who is a different color from the other little fish. This special adaptation helps him to avoid the bigger fish but leaves him very much alone. During his travels, he comes to realize that all creatures in the ocean have special adaptations and he uses what he learns to help the other little fish adapt for survival.

The Alabama Outdoor Classroom Program is a partnership between:

Alabama Cooperative Extension System

Alabama Wildlife Federation
www.alabamawildlife.org/classrooms/

Alabama Department of Conservation & Natural Resources