Fishy Business

Subject: Math, Science
Duration: 1 Class Period
Location: Classroom
Vocabulary: exotic, native, food chain, predator, prey
Related Activities: Break the Chain, Everglades "Most Wanted," Unwanted Guest, Go Back Home, Going…Going…Gone!, Population Explosion
Florida Sunshine State Standards: MA.E.3.2, SC.G.1.1, SC.G.2.1

Objectives. Students will be able to 1) Discuss a basic food chain, 2) Define and give examples of exotic species, 3) Discuss how exotic species can disrupt a food chain.

Materials
- "Food tokens"
- Gym vests or colored t-shirts
- Four hula-hoops
- Pencil and paper
- Whistle

Method. Students will examine the effect of exotic species on an ecosystem by role-playing both a healthy food chain and one that has been impacted by Mayan cichlids.

Background. Exotic species are plants or animals that are not native to a certain habitat. One of these species is called a Mayan cichlid. This fish invades the habitat of the native sunfish and competes for the same food source. Both the cichlid and the sunfish eat small fishes and aquatic invertebrates. The cichlid is also an aggressive eater, usually being the first to reach a food source and fighting off the native sunfish. This becomes a problem for the native sunfish as they are losing food sources and cannot compete with the more aggressive cichlids for food. The cichlids are faster and more aggressive and, therefore, find and consume more of the food.

Suggested Procedure

1. Select students to either be egrets or sunfish - approximately one egret for every four to six sunfish. You will not yet choose students to be the cichlids, the first few rounds are to see how a normal food chain would work. Use gym vests or colored t-shirts to help identify predators from prey.

2. Using a gymnasium or field, identify one end of the field as the "food source" and the other end as the "shelter".

3. Place the four hula-hoops in the open area between the "shelter" and the "food". These will represent shelter or cover for the sunfish and can be randomly distributed on the field.

4. "Food Tokens" (poker chips or pipe cleaners work as well) are placed at the end of the field designated as "food source". Be sure to have at least 3 food tokens for each sunfish.

5. Use the whistle to start each round. When a round begins, sunfish start from their shelter. The task of the sunfish is to move from the primary shelter to the food source, collecting one food token each trip, and returning to the primary shelter. Their travel is hazardous, however. They need to be alert to possible predators like the egrets. If they spot an egret, they can hide under cover (in a hula-hoop) for 5 seconds.

6. The egrets start the activity anywhere in the open area between the ends of the field and thus are randomly distributed between the sunfish's food and the primary shelter. Egrets attempt to capture sunfish for food, tagging only the sunfish that are not under cover. When a sunfish is eaten, they must go sit on the sidelines for the duration of the first round. During each round, an egret can only eat (tag) 2 sunfish. This is their food limit. (Reminder: sunfish have a food limit of 3)

7. When each sunfish has accumulated 3 tokens at the primary shelter, a round is over. Using the paper and pencil, have the students record how many sunfish were able to survive.

8. Optional - play another round using just the native sunfish and the egrets and record that data as well. See how many sunfish are able to survive each round.

9. Note: establish ground rules for student behavior. Behave in ways that are not harmful to other students: no tackling, shoving or hitting! Also, have the students *walk*, this way they aren't colliding.

10. After a few rounds of the natural food chain, introduce the Mayan cichlids. Choose about 1/4 of the students to represent the cichlids. The rounds will continue as before, but this time the way the students move will be different. Since the cichlids are faster and more aggressive, they are able to move normally. The sunfish must now hop on one leg to symbolize their slower movement. So they don't get tired, the students can switch legs after they've hopped on the same one 5 times.

11. Record the number of sunfish that survived versus the number of cichlids.

12. Play another round, this time increasing the number or cichlids. Any student who was "eaten" during the previous round is now a cichlid. This continues for as many rounds as long as there are sunfish. Remember to record the number of cichlids versus the number of sunfish at the end of each round.

Evaluation

1. What might be the eventual result if we continued this activity?
2. Is this result favorable? Why or why not?

Extension

Have the students create a bar and line graph illustrating the results of the experiment. Once the students have recognized the negative effects of the Mayan Cichlids, have them put together a brief classroom presentation on how they might propose solving this difficult problem and prevent such a thing from happening again.