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Glenfield Middle School	
Montclair, NJ	Science, Geography
2004	Grades 5-7
Damselfish in Barbados	Two-three 40 min periods

Abstract:

In this lesson, students will play a game in order to learn about survival in the reef. In order to play the game, students will act out the parts of various reef fish including damselfish, both male and female, and damselfish predators such as groupers and snappers. The male damselfish will try to defend their nest against the predators and coax the female fish to lay eggs there. The predators will try to distract the males in order to eat the eggs. All the while this is happening, the coral reef, habitat to both the damselfish and the predators is being destroyed by pollution.

Academic Standards Addressed: NJ Science standards 5.1, 5.2, 5.6, 5.7

Goal: While playing the game, students will better understand the complex coral reef ecosystem. The students will also be able to realize the dangers of habitat destruction.

Performance Indicators: After playing the game, students will be able to complete a sheet answering reef ecology questions.

Background Information: Students will need to be familiar with corals, sponges, damselfish, groupers, and snappers. Students should be aware of the ways that the male damselfish attract females and defends their nests. They should also know that pollution destroys coral reefs and that reef fish will not survive if their habitat is gone. This can be done in the first lesson.

Materials: Construction paper to create corals and sponges

Black magic marker

Paper vests to identify predators

Activity worksheet

Egg stickers

Food stickers

Technology: Students should use computer to look up pictures of damselfish, groupers, snappers, corals and sponges. They should also research the effects of pollution on coral reefs.

Introduction

This lesson is best taught while studying animals. The teacher should make a web to find out what the students know about coral reefs. She/he should ask the students what organisms live in coral reefs. Any student that has visited a coral reef should share his or her experiences. The teacher should show pictures or video clips of organisms that live in coral reefs. The teacher should also point out areas on the Earth where coral reefs are found.

Activity 1

Break the students into groups.

Group 1 should be at least three children. These children will be researching and acting the part of corals. Their job includes creating coral for the fish. They should also provide food for the fish. One person from the group should focus on the effects of pollution on coral reefs.

Group 2 should be at least 6 children. These children will be researching and acting the part of the female damselfish. The female damselfish needs to get food and to lay eggs in the male's nest.

Group 3 should be at least 6 children. These children will be researching and acting the part of the male damselfish. The male damselfish needs to get food and to make sure the snapper and the grouper do not eat the eggs. They also need to perform a specific "dance" to coax the females to lay their eggs in the male's nests.

Group 4 should be 3-4 children. These children will be researching and acting the part of the damselfish predators- snappers and groupers. The main job of these reef fish is to distract the male and eat the damselfish eggs.

Each group should first research their organism(s). They should obtain a picture of their organism(s) and be able to answer the following questions:

1. Where does the organism(s) live?
2. What does the organism(s) need to survive?
3. How does the organism react with other organism(s)?
4. What does the organism(s) eat?
5. What are the primary predators of the organism(s)?
6. What are the organism(s) reproductive strategies?
7. What are the defense strategies of each organism(s)?
8. What would happen to the organism(s) if the ecosystem were to change?

Students should answer the questions and share their findings with the class.

Activity 2

Students will now act out the part of each organism(s) that he/she researched in order to play a game. The game should be about 10 minutes long and can be played several times in one class period.

Group 1- Corals. Two students are to create coral. They can do this by cutting construction paper and putting food stickers on the coral. To start the game, there should be at least 5 "coral" sections in the room. The male damselfish needs to find a nest in the coral. Throughout the game, the students are to make more coral. They are also to add food stickers to the coral for the reef fish. One student plays the part of pollution. The pollution destroys the coral. This student will walk around with a black marker and color the coral. If the coral is colored black, reef fish can not live there because the coral is dead. If a damselfish has a nest in a coral that is effected by pollution (colored black) the fish must move and find a new nest.

Group 2- Female Damselfish. All female damselfish will start with many egg stickers. Once the male does the courtship dance, the female can lay eggs in his nest. The female should not lay all of her eggs in the same nest. The female should also try to stay out of the way of the groupers and snappers. While the female lays eggs, she should also be gathering food. By the end of the game, the female should have at least 20 food stickers.

Group 3- Male Damselfish. The main job of the male damselfish is to protect the nest. He should

watch the nest at all times and not let the snappers or groupers in the nest. He should also try to stay out of the way of the predators while gathering food. Like the female, he should have at least 20 food stickers by the end of the game. Besides guarding the nest and gathering food, the male also needs to try and convince the female to lay her eggs in his nest. He does this by performing a "head bobbing" dance. Females will not lay eggs in his nest unless the dance is done.

Group 4- Snappers and Groupers. These fish are to try and steal the eggs from the nest of the male damselfish. The groupers and snappers should have at least 20 egg stickers by the end of the game. They should not go straight up to the female or male damselfish but should try and take the eggs while the male is out courting or getting food.

At the end of the game

After the game is played a few times, the students should sit down and discuss the parts they played. They should be able to answer the following questions. The teacher can also use these questions to make a worksheet that assesses the students' knowledge of reef ecology.

1. Which part of the game was the hardest? Why?
2. Which part of the game was the easiest ? Why?
3. What would happen if the number of predators increased?
4. What would happen if the number of damselfish increased?
5. What would happen if there were more students playing the part of the pollution?
6. What would happen if there were less students playing the part of the coral?
7. If you could change the game to make it better or more realistic, how would you do it?

Assessment: The teacher can use or make a worksheet using the previous questions or make a quiz testing their knowledge of coral reef ecosystem dynamics.

Connection to Other This lesson also demonstrates an understanding of
Content Areas: geography. Students should be able to identify coral reefs on a world map.

Extensions: Other organisms such as snapper and grouper predators can be added to the game. The game can be changed to include more pollution or more predators.
