Topic: Importance of Marine Protected Areas: an Overfishing Simulation

Goal: Students will participate in an activity to achieve an understanding of Marine Protected Areas and the importance of managing marine environments. They will use the experience to launch a further study of MPAs in California and the process of establishing the boundaries.

State (Show-Me) Standards: Process Standards 1.3, 2.4, 3.1 , 4.3

Content Standards SC4, SC8

Time: Two 50-minute Class Periods

Objectives:

Students will use information from simulation activity to formulate questions as a group.

Students will research the answers to their questions.

Students will present their findings to the class.

Groups: Students will work in eight groups of three students each. Each student will take one of the following roles:

1. Collector (responsible for bringing catch in)

2. Timer (makes sure that the group completes collection and returns within given time)

3. Recorder (marks numbered area from which fish are collected)

Materials: Fish cards in envelopes, clipboards (1 per group), timers

Location: Preferably outdoor classroom pond area.

Introduction: Students will be given activity instructions as follows:

Your group will be given 4 minutes (representing 1 day) to go "fishing". You must adhere to these guidelines:

1. The "fish" are in envelopes along the pond
2. You may not collect fish in the Marine Protected Areas, posted with yellow tape.
3. Your limit is 5 envelopes. Any catch not brought back to the meeting area within the 4 minute "day" will not count towards your catch total.
4. Your group will tally the catch based on fish type and number of each type.
5. Wait to be released for the next "day", and then collect again for 4 minutes.
6. Return and tally.
7. If time allows, we will fish for a third "day".

One group will secretly fish from one of the MPAs, arranged prior to class. While students tally the first day's catch, the teacher will replace envelopes around the pond with new envelopes. Those envelopes placed around the violated MPA will have very few fish in them.

Upon returning to the classroom, students will submit their totals, and marked location of numbered fishing area on the map. Some students will notice the decrease in catch on day 2, but we will hold discussion on that until the next class period.

Class Period 2: Begin asking questions and discuss fishing outcome of day 1 compared to day 2 and 3. Have students make observations and discuss reasons for the drop for some groups. If some students were seen violating the MPAs, it will probably come up at this time. Stimulate discussion of MPAs and arrive at questions such as:

1. How are MPAs beneficial in Marine Conservation?
2. How are boundaries of MPAs established?
3. Who makes the boundary decisions?
4. What organism life stages must be considered when determining a boundary?
5. How are fish numbers monitored to determine effectiveness of MPAs?
6. How might seasons and time of day affect fish populations?
7. What are some environmental factors that can influence the MPA boundaries?
8. Who is responsible for oversight of the MPAs?
9. How are Network MPAs different from other MPAs? Are they better? Why or why not?
10. What examples of MPA effects have scientists learned from? What did they learn?

In order to investigate all of these questions, each group will research one question and present the answer to the rest of the class. (The presentations may require a third day.)

Students will use information attained from the website http://www.dfg.ca.gov/mlpa

Students will also be provided with information from Keynote Speakers from the COSEE-WEST

workshop.

Assessment: Students will listen to presentations and summarize answers with their group. Each student will complete the attached worksheet based on presentations and group discussions. Students will also be graded on their group's presentation.

Marine Protected Area Worksheet

Name_____

Group Members_____

_____

Your task _____

1. How are boundaries of MPAs established?
2. Who makes the boundary decisions?
3. What organism life stages must be considered when determining a boundary?
4. How are fish numbers monitored to determine effectiveness of MPAs?
5. How might seasons and time of day affect fish populations?
6. What are some environmental factors that can influence the MPA boundaries?
7. Who is responsible for oversight of the MPAs?
8. How are Network MPAs different from other MPAs? Are they better? Why or why not?
9. What examples of MPA effects have scientists learned from? What did they learn?