Predator/Prey Activity: Fish Feeding, Environments, and General Behavior

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**Recommended Grades:**

Designed for 3rd or 4th graders

**Goals:**

The purpose of this lesson is to introduce the concept of environment and survival among different marine life. The lesson is focused on the ocean environment, however it may also be applied to mammals.

**Time Required for Activity:**

One hour for Activity #1 and #2 (can be separated); Activity #3 is designed for several weeks of observation and discussion.

**Introduction to the Activities:**

(The introduction is done as questions and answers to keep the children engaged and participating.)

The first topic of discussion is environment. The following questions should be asked to assess the children's knowledge in this area.

- What is an environment?
- What makes an environment?
- What is your environment like?
- How does your environment differ from someone who lives in Alaska?

Discuss the difference between the desert and arctic environments. (The type of clothing, food, and activities).

Not only do environments differ among humans, marine life have different environments as well. What is the ocean environment like? Discuss three different kinds of environments. (Sandy bottom, open water, and coral reef)
Can you give us some examples of marine life that might live in these environments? (open water: big fish for example a shark or schooling fish, coral reef: small tropical fish, sandy bottom: bottom feeders for example string rays)

Activity #1: Fish Live in Different Environments.

*Note to the teacher:* Different marine life live in different areas for two primary reasons; 1. protection and 2. food. Marine life gain protection through their environment by either camouflaging themselves or schooling together in their environment. Different types of marine life feed differently depending on their capacity for intake. For example, sharks have large mouths with sharp teeth that allow them to eat other fish. Another example is coral fish that may only have the capacity to eat vegetation and particles on the coral. Bottom feeders such as string rays filter the water on the bottom in search of small food particles. Emphasize that the food intake is based on the different sizes and composition of the mouth.

Materials:

Color Sheet with Fish and Environments

Procedure:

Handout the worksheet with the three different environments and fish. Have the children match each fish with the appropriate environment.

Activity #2 - Feeding Styles of Different Fish.

In this activity the students will use plastic utensils to simulate different sizes/types of mouths (predator) and the beans represent the different prey.

Materials:

8 plastic knives
8 plastic forks
8 plastic spoons
24 Dixie cups
1 bag of Lima beans
1 bag of pinto beans
1 bag of split peas

*Three different environments need to be accessible; sand, grass, and
Procedures:

Hand out the plastic utensils. Each student gets one of the three utensils, at random, and an equal quantity of each should be dispersed. Hand out the Dixie cups, which represent the stomach of the fish. Next, mix the three bags of beans together. The students will visit three different environments, grass, sandbox, and concrete. The beans will be dispersed in each environment. The students should get one to three minutes to collect the beans. However, there must be some rules established.

Rules:

1. The students must have their stomachs in one hand and their mouths in the other at all times.
2. The students should not be allowed to use their stomachs to assist in bean collection. The students should be allowed to compete for their prey. For example, if one of the utensils is better at picking up beans in a certain environment then they are allowed to try to obtain a different predator's prey (bean). However, once the utensil and bean leave the ground, another predator can not attempt to retrieve that bean.
3. The students should not collect anything but the beans. For example, they should not collect sand or grass or they will be docked tally points.
4. After each environment tally up the results. The following conclusion should be drawn.

Discussion:

Before discussing the results, understand that it is key to the success of this activity that the students make the connection between the utensils and the mouth of the fish. Discuss the results from each environment. Come to the conclusion that different fish survive better in environments because they are better equipped for that environment. You can parallel this behavior with that of mammals to drive the point home.

Usual Results:

1. The forks were the best predators for all the environments. They were the most versatile and adaptable.
2. The spoons could have also been successful in the sand and grass environment. However, they tend to collect a lot of sand and grass, leading to a loss of points.
3. The knives were the most successful in picking up the flat beans, especially off the concrete.
Other conclusions may also be derived. Whatever the case may be, come to a general consensus with the class.

**Activity #3: Fish Behavioral Observations**

The above activities can be extended into a behavioral study about fish and their environments and eating behaviors. A fish tank with three different environments and different types of fish should be set up in the room. Try to simulate the three environments discussed in the above lesson.

Seek advice from a pet store about the type of tank, how to set-up the tank, and how to select compatible fish that live in different parts of the tank, but at the same temperature. It can take a week or more to establish the tank before fish can be added, so plan accordingly.

The students should keep a journal on the fish activity and what, when and where the different types of fish live and eat. Watch for certain changes in the fish as they become more adapted to their environment. This activity really brings the lesson to reality and the children enjoy watching the fish.

Variations that could be added over time, depending upon the experiments proposed by the students, might be: (1) start with very few fish; allow them to establish relationships; add more of the same type or different types of fish. How does this change the behavior of the original fish? (2) change the environment by starting out with few places to hide and adding artificial plants, caves, etc where the fish can hide. How does the behavior of the fish change? Note: changing the temperature, lighting conditions, or amount of food would likely put significant stress on the fish and induce lethality in the population. For obvious reasons, this type of experiment should be prohibited.