

Ecosystem Survivor [ME]

Adapted from Smithsonian Institute Ocean Portal

Grades: 6-8

Time: 45 minutes to 1 hour

Goals: To understand what living and non-living things organisms need to survive.

Objectives:

Students will be able to: differentiate between living and non-living things; understand what essentials are needed for survival; demonstrate interactions between organisms and their ecosystems; and explain what happens when resources for survival become limited.

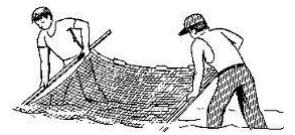
Materials:

- Large playing area
- Rope or chalk
- Laminated species cards (found on pages 52-55)
- String
- One-hole punch

Preparation: Prepare the species cards by laminating them and fitting them with string so the students can wear them around their necks. They will need their hands free for the activity but individual species need to be identified. This lesson can be used as a follow-up lesson with Match My Habitat from Unit One.

Procedures:

1. Pre-Activity (introduction): Begin inside the classroom with a discussion of species interactions with each other and with their environment. You can explain that this is called ecology and scientists study these types of behavior. Ask the students what they need to survive. Examples will be food, water, shelter, and oxygen. Ask them to define what other organisms need to survive and choose one of the coastal ecosystems from this manual to guide you into a discussion about the types of food, water, shelter, oxygen, and space that can be found there.
2. Activity: Take the students to a large playing area; this can be outside or in a gym, if it is available. Students will be divided into two groups: species and survival needs. The survival needs for this lesson will be food, shelter, space, and oxygen, since they are living in an aquatic ecosystem. For each round of the game, students will use the appropriate hand signals: food = hands on stomach, shelter = hands up like a tent over the head, space = arms out wide, and oxygen = sweeping hands in front of the mouth.



Create two parallel lines with the rope or chalk. Give the students a decent sized playing area to be able to find their match. Have the “species” students stand behind one line with their backs facing the center and the “survival needs” behind the other line with their backs facing the center as well. All students choose which hand signals they wish to use before they are allowed to turn around and they are not allowed to change their mind halfway through the round. When you say go, they turn around and find their match; if a species is looking for food, they look for a student who is showing the food hand signal. Once they find a match, they must bring that student over to the species line. Any species that does not find a resource they are looking for “dies” and becomes part of the ecosystem (goes to the survival needs line).

Keep track of how many organisms there are in each round and play several rounds of the game. Encourage students to change their hand signals to alter the amount of resources available and also to give variation to what each organism is looking for at a given time. This will become part of the discussion.

3. Post-Activity (review): This can be done in the large playing area or back in the classroom. Inform the students what happened to the number of organisms in each round. Explain that this is called population dynamics and it is another field of science that ecologists will study. Have the students relay back to you what they demonstrated with the game and how important finding the right resources was for survival. Discuss how adding in bigger predators and even humans would influence the survival needs and resources of the species. What kind of a strain would limiting resources have?

Key Words:

Ecosystem

Habitat

Survival needs

Ecology

Ecologists

Limited resources

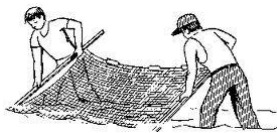
Population dynamics

Predator-prey relationships

Background Information:

Adapted from Dialogue For Kids

Just like our homes, species require a place to live. Some of our homes are as small as a loft or as large as a mansion; the same holds true for other species. Their homes, or habitats, can be as small as their den or burrow, or as large as a whole ocean. Within our habitats, we all require certain things to survive: food, water, oxygen, and a place to live or shelter.



Where we can go to a supermarket to purchase our food, other species have to hunt and gather their own, so a main requirement of their habitat would be an abundance of a food source. For herbivores, or primary consumers, their food source would most likely be found in an open meadow, a field, or a dense forest floor. In the marine ecosystem, their food source would be phytoplankton, algae, eelgrass, seaweed, or kelp. For omnivores, or secondary consumers, their habitat would be wherever their primary food source was located. This is a main reason for many secondary consumers migrating into and out of large habitats, to follow their food source.

Since all species have the same basic requirements, it is not uncommon to find many different species occupying the same habitats. All of these species will interact with each other, as food sources, potential mates, rivals for territory, or groups such as flocks, pods, or herds. Together, they create a community within their habitat.

When we look at species diversity, we are looking at the number of individuals within a species as well as the number of different species within one habitat. When we say that a habitat has high biodiversity, it means that there are a lot of different species and individuals occupying that one habitat. But, when a habitat exhibits low biodiversity, it could mean something is wrong within that habitat. Sometimes low biodiversity can be caused by habitat destruction from humans, decreasing the amount of space and food sources available to the species that occupy it.

When there is low biodiversity, we often will designate an area as a “critical habitat” that must be protected and conserved by law to prevent any further damage. Sometimes though, it is too late for species to survive in such low numbers and without proper food and shelter, and they go extinct. By surveying different habitats, we can understand how species interact with each other, how many individuals are located within the habitat, and whether the habitat needs to be protected from further human interference.

