TEACHER
ACTIVITY OUTLINE

wyland ocean challenge

AQUATIC ECOSYSTEMS

Activity No. FOURTEEN

Title: ECOSYSTEM SCRAMBLE: A COLLAGE OF BENEFITS

OBJECTIVES:
{students will be able to}

- Identify adaptations organisms have for protection, hunting, and movement.
- Sort organisms into their correct ecosystems based on their adaptations.
- Define the terms biotic (living) and abiotic (nonliving)
- List biotic and abiotic factors that make up their studied ecosystem
- Define the terms biotic (living) and abiotic (nonliving)
- List biotic and abiotic factors that make up their studied ecosystem
- Name items and activities related to those ecosystems that are beneficial to humans.

SUMMARY:

Students will study the biotic and abiotic factors that make up their studies ecosystem. They will discover how the biotic factors (plants and animals) interact with, rely on, and use other biotic and abiotic factors in their ecosystems. Students will examine which organisms will survive well in a specific habitat based on their adaptations and will sort organisms into ecosystems accordingly. Students will explore how humans interact with, rely on, and use their ecosystem. They will create a collage depicting the biotic and abiotic factors in their ecosystem. Students will also show the human need for these habitats by adding to their collage a representation of items and activities from this ecosystem that are beneficial to people. Students will also begin to explore implications of human interactions with and disruption of their ecosystem.

TIME NEEDED:

1-3 sessions

MATERIALS:

SCIENCE MATERIALS
- Students' Field Notebooks
- Eco-guide: What is a ?, How humans affect
- Copies of empty habitat images (we suggest you laminate them)
- Copies of organism cards (you can download and print extra copies from our website www.wylandoceanchallenge.org)
- Student activity sheet
- Field guides (fish, mammals, birds, etc.)

ART MATERIALS
- Color ad sections of newspapers (grocery store ads are great), magazines, old calendars, etc...
- Assorted colors of construction paper
- Assorted colors of tissue paper
- White glue or glue sticks
- Craft sticks (to help spread glue)
- Crayons or markers
- Scissors

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p PREPARATION:

- Read Background: What is an ecosystem? Adaptations, Food webs, Relationships
- Select organism cards to use for examples of adaptations

a ACTIVITY INTRODUCTION:

1. Ask students what a habitat is. A habitat is the physical environment that provides food and shelter for living things. Ask students what an ecosystem is. An ecosystem is the biotic (living) and abiotic (non-living) things working together in balance. Brainstorm a list of all biotic and abiotic factors in your ecosystem. This list should include things like rocks, sunlight, oxygen, rain, the stream feeding your ecosystem, etc, as well as the fish, invertebrates, plants, algaes, etc. This list can also include interactions between biotic and abiotic factors.
2. Ask students if the same organisms live in all habitats? Would the same organisms live in the same type of habitat in a different area of the world?
3. Have students explain why only certain organisms can live in a specific habitat. Write these reasons on the board. Can they think of an organism that can survive just about anywhere? How about people? How do we manage that?
4. Hold up an organism card from an aquatic ecosystem of choice and ask students if this organism has adaptations. Define adaptations as needed as characteristics that help an animal or plant survive in its habitat. An easy way to remember what adaptations are is that they are something that is on a body, in a body, or something that a body does. Ask students to guess what adaptations this organism has for protection, hunting, and movement. Repeat this process for a few organisms.
5. Ask students to consider how these organisms work together in the habitat to form an ecosystem. How are they connected to the physical environment? Can they survive if the physical environment changes? Some animals are generally adapted and can survive when their environment changes. Others are very sensitive to change. Do humans play a role in ecosystems? How?

e EXPLORATION:

1. Put students into small groups and explain that they will be receiving an empty habitat and two sets of organism cards. Instruct students to do their best in deciding which organisms belong to that habitat and which do not. Students may use Eco-guide, field books, and the Internet if desired to help them.
2. Once students have sorted the organisms, have them compare with other groups and go over the results as a class.
3. Ask students how they think everything in their fits together. Chose an animal to use as an example for the next activity. Have students think of a day in the life of that animal. What parts of the ecosystem does that animal interact with? What does it eat? Does it hide behind a rock to sneak up on its prey? Does it use a cave to hide from its predators? Does it use oxygen from the water? Does it need sunlight? What about its food's need for sunlight? Does it use other animals for protection? For cleaning? What aspects of its ecosystem does it rely on in using its coloration? Go through all the contributors to that animal's survival.

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EXPLORATION:
{continued}

4. Pass out Student Activity Sheet. Tell students to choose an animal to study. They can work with a partner or in groups as well.
5. After students are finished with their activity sheets, gather them for a short large group discussion. What were their findings? Did they discover anything new about their animal or the ecosystem? If multiple students did the same animal, have them compare their findings. Ask to students to think about what would happen if one of the factors was changed or removed. How would that affect their animal?
6. Ask students to think about how we are connected to the water ecosystem. What does the ecosystem provide for us? How do we use it? Think about recreation, food items, and other products. (Record some of the ideas that student share, for example, we eat fish).
7. Working in groups, have students brainstorm and list items in their ecosystem that are beneficial to humans or are products for human use.
8. Once students have generated their lists about how humans are connected to the aquatic ecosystem, begin a discussion by asking what would happen if we did not have these products from the ecosystem? Could we survive without them?
9. Have students write in their field notebooks what it would be like without some of the products we use from their list.
10. Next, ask students to brainstorm some of the ways human are changing or adapting the ecosystems (this is a great place talk about development, over fishing, dams, etc.) in order for students to see that we are often the reason why ecosystems are changing and species are endangered. For more in-depth studies on human affects and specifically deforestation, temperature pollution and development, see Human Impacts.
11. Explain to students that they will be creating a collage showing biotic and abiotic factors that make up the ecosystem. They will also add a representation of items and activities from their ecosystem that are beneficial to humans. The collage should creatively show the connection between the ecosystem and humans, and include all the factors from their activity sheet.
12. Allow students to do additional research using the eco-guide, Internet and books.

COMMUNICATION:
{and assessment}

1. Students should answer the following questions in their field notebooks:
   a. Pick three organisms from the ecosystem and explain what adaptations they have for living there.
   b. How have the interactions or changes humans have made to this ecosystem affected the organisms that live there?
   c. Write a summary explaining the images you chose to include in your collage and the connections between people and the ecosystem. Include a product from the collage that would be difficult for you to live without and why.
   d. What are some ideas that you have to ensure that current water ecosystems remain balanced and productive?
2. Art Challenge: Create a heart map for your animal. In your journal, depict all the things that you think the animal would include as their most favorite and most needed things or items.

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ADAPTATIONS:

For younger students:
Focus on habitats instead of ecosystems and how habitats provide basic needs such as food and shelter. For their collages, you'll need to do a little background research ahead of time. Have a selection of images already available for them and discuss beforehand what benefits people get from the habitat. Have students draw their habitat and then trace their hand onto the picture somewhere. Students will paste the images over their hand to show the connections between people and the habitat. They can embellish as desired with tissue and construction paper.

For older students:
Ask older students to research ways in which humans impact the ecosystem. Challenge them to depict in their collage not only the ways people benefit from the ecosystem, but the ways in which we damage it as well. Is the exchange equal? They can add a poem to their artwork to complete it. Have them write their poems in their field notebooks and write a short paragraph on if they feel there is an equal exchange for people and wildlife in this ecosystem.

TEACHER SUPPLEMENT

KELP FOREST HABITAT

TEACHER SUPPLEMENT

LAKE HABITAT

RIVER HABITAT

ESTUARY HABITAT

TEACHER SUPPLEMENT

WETLAND HABITAT

STUDENT
ACTIVITY SHEET

Activity No. 14

ECOSYSTEM SCRAMBLE

Name:

Date:

Ecosystem:

Choose two different animals from your ecosystem. What are all the biotic (living) and abiotic (non-living) factors that your animal affects, and that affect your animal?

Animal 1:

Adaptations:

Abiotic (non-living) factors:

Biotic (living) factors:

Animal 2:

Adaptations:

Abiotic (non-living) factors:

Biotic (living) factors: