

NAME: _____



Activity One



Clean Up an Aquatic Ecosystem

Choose an aquatic ecosystem near where you live and help clean it up. You can do this on your own or try to find public projects that recruit many volunteers to attend a clean-up day. The main thing you can do is pick up trash from the shoreline. You can also take a rake or other tool and pull trash out of the water. Be sure to dispose of the trash in a way that will prevent it from returning to the environment. Recycle as much of the trash as possible.

Make tallies of how many pieces of trash fall into each of the following categories:

- Plastic
- Glass
- Rubber
- Aluminum
- Iron
- Other metals
- Fishing tackle
- Paper or cloth

In which ways could some of these objects endanger wildlife?

Note anything else related to the health of the ecosystem. Did you see any invasive species? Did you see any oil on the surface? Did there seem to be too much algae in the water?

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Activity Two



Visit a Pet Store

Find a large pet store that specializes in a wide variety of fish. You can begin by looking through the phone book yellow pages. Also look for web sites of pet stores near where you live. Pet stores with tanks of fish on display must be able to create a small, artificial ecosystem in each tank. If the fish and other organisms are healthy, then the ecosystem is providing everything a wild ecosystem provides.

What all this means, is that someone in the store must know something about aquatic ecosystems, even if he doesn't think of it in those terms. Your goal is to find that person and ask him some questions.

Here are some starters:

1. Are some tanks fresh water and some salt water?
2. Do any of the tanks try to copy ecosystems from particular parts of the world?
3. Do you have to provide food to all the consumers, or can some of them find it in the tank?
4. Do you ever put predators and prey in the same tank?
5. Do plants supply all the oxygen, or do you have to supply it?
6. Are there any other biotic or abiotic factors that are controlled by you?

If you find a person who is really enjoying his work, you will probably learn much more than just the answers to these questions.

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Activity Three



Write a Report About Ancient Aquatic Ecosystems

The first ecosystems to appear on Earth were marine aquatic ecosystems. In fact, for several billion years, ecosystems existed only in the ocean. The earliest ecosystems had no animal life in them, only plants. Learn about the organisms in these early aquatic ecosystems. Search the library and internet for “ancient oceans”, “origin of life”, evolution, or “marine evolution” for a start. Write a brief report that answers as many of these questions as possible:

1. What were the first organisms?
2. Why were there no animals for billions of years, when did the first animals appear, and how did plants make their survival possible?
3. What were some of the plants and animals in ancient aquatic ecosystems, which ones are now extinct, and which are not?
4. What caused some of the early mass extinctions?
5. When did plants and animals first appear on land?

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Activity Four



Write a Report on the Arctic Ecosystem

The Arctic ecosystem is changing because temperature is rising, and Arctic sea ice and glaciers are shrinking. Sea ice is an important abiotic factor in the ecosystem, especially for polar bears. These bears are one of the top predators in the Arctic. Begin gathering information by learning about the food chains that make up the food web of the Arctic marine ecosystem. Also try to find out what governments, politicians, and environmental groups are saying about the changing Arctic ecosystem. In your report, try to answer these questions:

1. How does changing sea ice threaten polar bears' survival?
2. How does survival of polar bears affect the arctic food web? Learn how the populations of other species will change if the polar bear population decreases.
3. What are the predictions for the future of polar bears?
4. What measures are being taken to protect polar bears?

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Activity Five



Write a Report About the Chemistry of Acid Rain

For this project you will need to have some basic understanding of chemistry and chemical reactions and you will need to be able to read and understand chemical equations and formulas. It would also help to have an understanding of the pH scale. The report will be about the effect of acid rain on lentic, freshwater ecosystems (i.e., on lakes and ponds).

Search for information on the following: acid rain, lentic system ecology, sulfur dioxide, nitrogen oxides, coal burning power plants, and vehicle exhaust. In the report try to answer these questions:

1. What is the source of the gases that cause acid rain?
2. What are the equations for formation of the acids in acid rain from these gases?
3. When acid rain increases the acidity (lowers the pH) of lentic systems, which species are affected and how?
4. How are species' diversity affected by acid rain?
5. Why are lakes with limestone bedrock on the bottom not affected by acid rain? What is the equation for the reaction that neutralizes the acid in acid rain?
6. What measures have been taken to reduce acid rain?

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Activity Six



Write a Report on Aquatic Animals That Have Recently Become Extinct

This report should be about aquatic animals that have become extinct in historical times. This is not about prehistoric animals we know about through the fossil record. The best way to begin is to find at least one web site for an organization that keeps track of extinctions. This will give you names and some pictures of recently extinct animals. Also search for information on the human activities that have caused extinction, like overfishing, pollution, deforestation, and introduction of foreign species.

When you find some good sources of information, you will have hundreds of species to choose from. The rate of extinction is very high these days. Pick a few of the animals you find most interesting and answer as many of these questions as you can about each:

1. What are its common and scientific names?
2. Where did it live?
3. Has its disappearance affected other species?
4. What most likely caused its extinction?
5. What close relatives have survived?

If there are pictures of the animals you chose, add those to your report. Some pictures may be drawings from the days before photography.