



## Bio-What?

### Contributor

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### Objectives

Bio-What?! What the heck is biodiversity? In a recent study, only two out of ten adults reported having heard about or knowing about “the loss of biological diversity.” Yet the accelerating loss of biodiversity is probably the most serious environmental threat facing the planet right now. In this lesson students learn about biodiversity and find out that our very survival as a species depends upon its preservation.

 **Time** 30 to 40 minutes

### ✂ Materials

- Overhead 1 “Biodiversity belongs.”
- Overhead 2 “Biodiversity helps us heal ourselves.”
- Overhead 3 “Biodiversity keeps natural areas together . . .”
- Overhead 4 “Biodiversity attracts tourists.”
- Overhead 5 “Biodiversity helps life to continue on earth.”
- Overhead 6 “Biodiversity gives us food.”
- Overhead 7 “Biodiversity helps cultural diversity to survive.”
- Student Handout – “7 Reasons to Protect Biodiversity”

### Getting Started

#### Knowledge Now

Begin by asking students: What does the word *biodiversity* mean? Break this word into two parts for the students: *bio* means *life*, *diversity* is a synonym for *variety*.

#### Engaging Interest

Ask students to speculate on how many species of plants and animals they think there are in the world?

The answer is that nobody actually knows. Scientists have far more questions than they have answers! Over 200 years ago the biologist Linnaeus told us that there were exactly 4,236 species. Since then, biologists and other scientists have named and described approximately 1.4 million species, although we know very little about the behavior of most of these species or the role they play in the ecosystem.

Estimates of the total number of species of plants and animals range from 10 to 80 million. Over three-quarters of this number is probably made up of members of the insect family.

The following open-ended statement will give students an opportunity to examine their own values, and to realize that not all their peers share those values! Read the following sentence aloud to your students:

*“If humans don’t have any use for a plant or an animal, then it might as well not exist in the first place.”*

- Ask your students if they agree or disagree with this statement, and to say why.
- Ask them to consider why might it be important to protect a specie even though it may have no direct value to humans?

Answers might include the following: to learn about it, it may play a role in keeping other “more important” species alive, it may be beautiful to look at or it may be the right thing to do. One important point that your students should understand is that biodiversity is being lost when a species is endangered or becomes extinct. A threatened species, like the grizzly bear, means that something is wrong in the ecosystem in which the species lives and that the something might well be capable of affecting humans as well as wild species.

## **Learning Activities**

Before showing the overheads, brainstorm with your class on the topic of why biodiversity is valuable. Write the class responses on the board.

Alternatively, consider using a cooperative carousel to help students discover the reasons for preserving biodiversity. Print the titles of each of the seven overheads on large flip chart papers and post these around the room. Divide the class into seven groups and provide each group with a different colored felt pen. Ask them to write an explanation or provide examples with each reason at the station where they start. Ask the groups to circulate clockwise every 60 seconds and add new ideas at each station. When students are finished, ask them to rotate to each station again and look at the ideas that were posted by others.

Using the overheads on the following pages, ask students to take notes as you go through the six main reasons why biodiversity should be preserved. Use the Student Handout to also elaborate each reason.

## **Assessment/Analysis/Application**

This lesson highlights the importance of maintaining biodiversity. Ask students to think about actions they could take in their own lives that will protect biodiversity. Compile a list and check later to see if they have followed through.

## Science 7 and 8 Learner Outcomes

Science 7A: Interactions and Ecosystems (interactions and interdependencies)

Science 8E: Fresh and Saltwater Systems: (diversity of life)

## Safe and Caring Topics and Concepts

**Building Respect for Diversity in Nature**

**Living Respectfully**

- Identify ways that people show respect and disrespect.

## Teaching Strategies

Go to	Cooperative Learning	Inquiry Learning	Direct Instruction
www.sacsc.ca for strategy descriptions	<ul style="list-style-type: none"> <li>• Cooperative Carousel</li> </ul>		<ul style="list-style-type: none"> <li>• Lecture</li> </ul>

Generalization and Transfer	Peer Teaching	Empathy/Affective Education	General Teaching Activities/Ideas
			<ul style="list-style-type: none"> <li>• Brainstorming</li> </ul>

## Supplementary Resources

- *Grizzly Bears Forever!* www.gbf.ca A free teaching kit is available for teachers.

This lesson initially appeared in the Global, Environmental & Outdoor Education Council's newsletter: *Connections* "Diversity" Vol. 27 (1), Fall 2002.

## Seven Reasons to Protect Biodiversity

<b>Biodiversity belongs.</b>	Biodiversity can be beautiful and can give us aesthetic pleasure: we like seeing wild animals, strange plants, or pretty flowers. But don't the "ugly" or "useless" animals and plants have the same right to exist that humans do? They are all products of a complex, miraculous system that created life on earth. Humans should respect other forms of life and make sure our actions don't destroy them.
<b>Biodiversity helps us heal ourselves.</b>	Many animals and plants may hold the key to some marvelous new invention or medicine. For example, Willows gave us Acetylsalicylic acid, or ASA, the active ingredient in Aspirin.
<b>Biodiversity keeps natural areas together.</b>	The loss of animals or plants from an ecosystem will affect other species in the food chain, which may in turn affect humans due to the food web effect, or in some unforeseen way.
<b>Biodiversity attracts tourists.</b>	Ecotourism may well be the best hope for the survival of protected areas, as it offers an economic argument for the preservation of nature, and can be done in a sustainable manner.
<b>Biodiversity helps life to continue on earth.</b>	The little rat-like mammals scurrying around at the time of the dinosaurs were warm blooded, a fact which may have contributed to their survival while all the dinosaurs went extinct. Evolutionary expansion, or 'radiant evolution' into the vacant niches left by the dinosaurs allowed mammal biodiversity to soar. The more species there are, the more adaptability there will be to changing conditions like global climate change.
<b>Biodiversity gives us food.</b>	Since humans need a variety of different plants and animals to breed crops and animals suitable for use on farms, a decrease in biodiversity means that scientists have fewer species to choose from when they try to develop a new type of species or crop. For example, when a fungus wiped out 15% of the American corn crop in 1970, biologists bred resistant hybrids from a species of Mexican wild corn.
<b>Biodiversity helps us preserve OUR diversity.</b>	The large number of human cultures that exist, complete with their own languages and customs, add to the diversity of the human experience and enrich us as a species. But the loss of biodiversity threatens these cultures, particularly those that live close the land - for example in the forests of the Amazon.

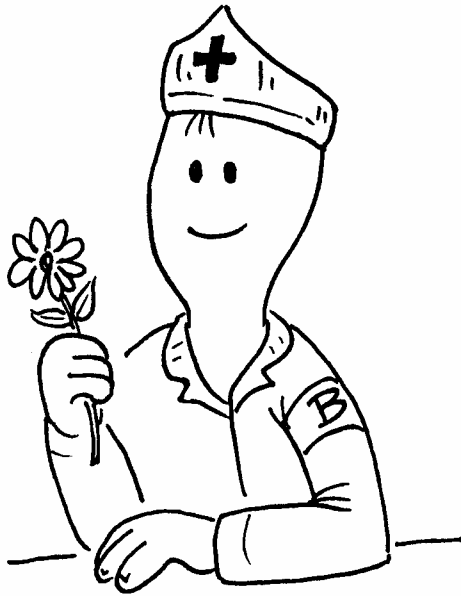
# Biodiversity belongs.



The plants and animals with whom we share this planet have a right to exist—whether or not they are useful to humans.

Do you think it is fair for humans to make another species go extinct?

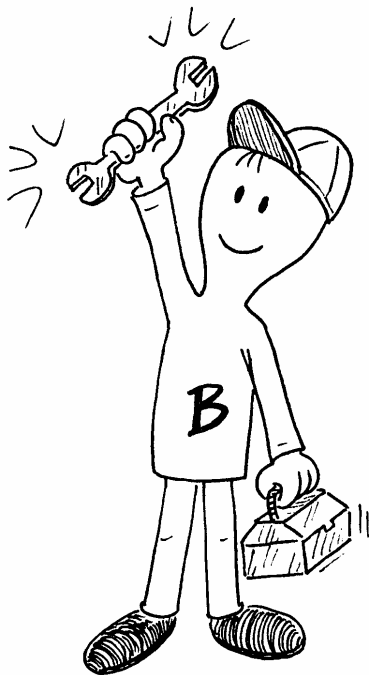
# Biodiversity helps us heal ourselves.



Over a hundred different species of plants are known to provide medicine for humans. Forty percent of the medicines found in pharmacies are derived from plants. Without the Rosy Periwinkle, many more children would die from Childhood Leukemia.

Does the cure for cancer or the common cold lie in a local plant? Perhaps—so let's preserve plant biodiversity.

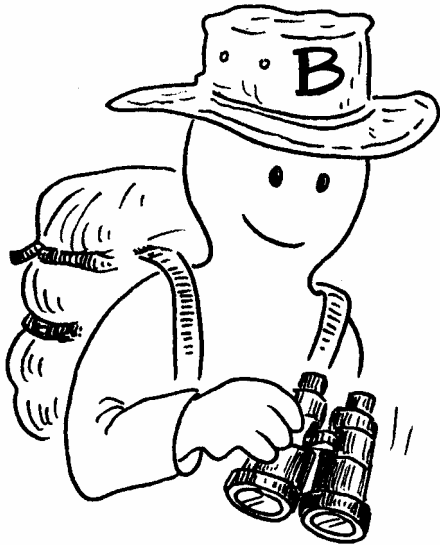
# Biodiversity keeps natural areas together...



....and natural areas (ecosystems) provide us with essential services like clean air and fresh water. Every time we lose a species from an ecosystem, we change the way the whole system works.

If this goes on for too long, the area loses its ability to provide us with ecosystem services.

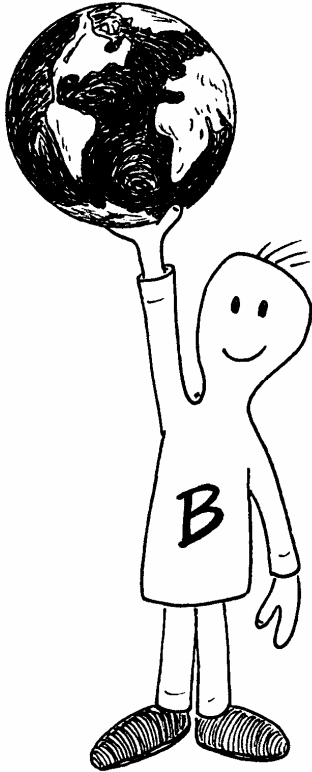
# Biodiversity attracts tourists.



Tourism is the most rapidly growing industry in the world; and ecotourism (which helps people enjoy nature and ecosystems) is the most rapidly growing kind of tourism! All kinds of places—from Canmore to Costa Rica—need to preserve biodiversity to keep their economy strong.

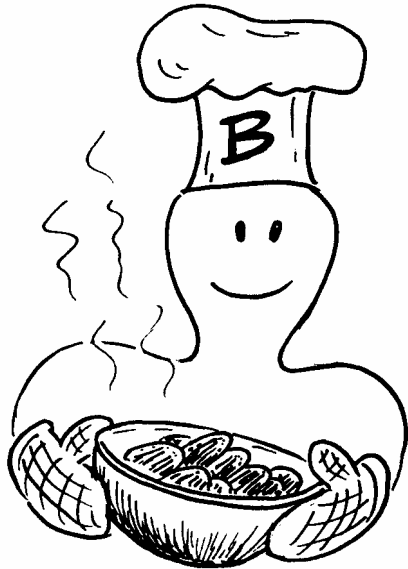


# Biodiversity helps life to continue on earth.



Biodiversity is life's insurance policy and helps evolution to take place. For example, biodiversity helped usher in the age of mammals 65 million years ago, when the dinosaurs became extinct!

# Biodiversity gives us food.



20 species of plants (wheat, rice, corn, potatoes, barley, cassava, sorghum, etc.) give us eighty percent of the food we eat. If disease or insect pests attack these crops, we'll need the more resistant varieties of these plants that are currently growing wild.

# **Biodiversity helps cultural diversity to survive**

The large number of human cultures that exist, complete with their own languages and customs, add to the diversity of the human experience and enrich us as a species. The loss of biodiversity also threatens these cultures, particularly those that live close to the land, for example, in the forests of the Amazon.