



Biodiversity: *Discussion Guide*

Overview

Biodiversity defines the Earth and distinguishes it from other planets. At this moment in time, more species of plant and animal life exist than at any other period in the evolutionary history of our planet. Also at this moment in time, more species of plant and animal life are on the brink of extinction than at any other period in time.

Help your students explore the diversity of the world in which they live and understand the threats that could wipe biodiversity off the face of the planet.

Classroom Activities

1. Show the “The Scientific Study of Biodiversity” and “Earth: A Unique Planet” segments from the *More is Better: The Biodiversity Story* video.
 - **Brainstorming:** Before showing the video segments, have students brainstorm answers to the following question: What makes Earth unique? Make a list on the board and revisit the answers after watching the videos.
 - **Quiz Yourself:** After viewing the videos, ask students the following questions to see what they remember:
 1. From which country were mongooses imported? Why are they such a problem?
 2. Which country is among the most biologically diverse and productive ecosystems in the world?
 3. Why are sea turtles in danger?
 4. What makes the Earth unique from other planets?
 5. What can be learned from erosion?
 6. What is different between extinction now and extinction in the past?
 - **Understanding Biodiversity:** Have students use the school or local library to learn more about biodiversity. Students might look at books, encyclopedias, newspapers, magazines, or scholarly journals.
 - **Biodiversity Hotspots:** Click on the Hotspots Explorer Interactive Map at <http://www.biodiversityhotspots.org/xp/Hotspots/> to learn more about the

Earth's biodiversity hotspots. After exploring with the interactive map, have students choose one hotspot to learn more about. Students can share their findings with the class by giving an oral report with visual aids.

2. Show the “The Threat to Biodiversity” segment from the *Elements of Biology: Ecosystems: Organisms and Their Environment* video. (Access to *unitedstreaming* is required.)
 - **Pre-Viewing Discussion:** Ask students: What do you know about biodiversity and ecosystems? What is the impact of human activity on soil erosion, air and water pollution, deforestation, and ocean reef destruction? Why is this a problem?
 - **Post-Viewing Discussion:** Did students know that so many species were endangered as a result of human intervention? Were they surprised to learn that the few healthy forests left on the planet could disappear in the next few decades? What else did they learn that was unexpected?
 - **Tell It Like It Is:** Ask students to create a poster campaign to inform their peers and community of the dangers of destroying the Earth's biodiversity.

3. Show the “Connected Systems: Biodiversity, Ecosystems, and Ecology” segment from the *Greatest Discoveries with Bill Nye: Biology* video. (Access to *unitedstreaming* is required.)
 - **Chemistry Experiment:** Have students recreate the experiment originally conducted by Joseph Priestly in the 1700s. The following web sites will help students reconstruct Priestly's experiment and understand what he was studying:
 - http://www2.nsta.org/Energy/find/primer/primer2_8.html
 - http://www2.nsta.org/Energy/find/primer/primer2_7.html
 - **Compare and Contrast:** In the video, the solar system is compared to an ecosystem in order to explain the scientific use of the word “system.” Have students compare and contrast the solar system with an ecosystem of their choice using the scientific use of the word “system.”
 - **Understanding Terms:** Have students make a list of words that are unfamiliar to them as they watch the video. After watching the video, have students look up the terms in a dictionary or encyclopedia. The following words might be unfamiliar: *macro systems, carbon dioxide, photosynthesis, biodiversity, tropical rainforests, species, deforestation, biological systems, ecosystems, environment, ecology, flood plain.*

4. Show the “Program Introduction: How Evolution has Led to Biodiversity” and “Venezuela: Evolutionary Paradise for Biodiversity” segments from the *Understanding Biodiversity* video. (Access to *unitedstreaming* is required.)

- **Web Organizer:** Have students create a web organizer that describes the biodiversity found in the tropical rain forests. Have them identify ecosystems, or habitats, and then identify the plant and animal species that live in each ecosystem.
- **Endangered Species Chart:** have students create a chart that illustrates an issue pertaining to endangered species. The chart can be general, addressing global issues, or it can be specific, addressing local issues. Students may use the following web sites to obtain additional information:
 - <http://www.fws.gov/endangered/>
 - <http://www.endangeredspecies.com/>
 - <http://www.kidsplanet.org/factsheets/map.html>
- **Personal Response:** Have students write a personal response that weighs the pros and cons of progress and the impact humans have on the natural world.

Academic Standards

Mid-continent Research for Education and Learning (McREL)

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K–12 Education addresses 14 content areas. To view the standards and benchmarks, visit <http://www.mcrel.org/compendium/browse.asp>.

This lesson plan addresses the following national standards:

- Science
 - Physical Systems
 - Understands the characteristics of ecosystems on Earth's surface
 - Uses of Geography
 - Understands global development and environmental issues
- Life Skills
 - Understands and applies the basic principles of presenting an argument
 - Effectively uses mental processes that are based on identifying similarities and differences
- Language Arts
 - Writing: Uses the general skills and strategies of the writing process; Gathers and uses information for research purposes
 - Reading: Uses reading skills and strategies to understand and interpret a variety of informational texts
 - Viewing: Uses viewing skills and strategies to understand and interpret visual media
 - Listening and Speaking: Uses listening and speaking strategies for different purposes

National Academy of Sciences



The National Academy of Sciences provides guidelines for teaching science in grades K–12 to promote scientific literacy. To view the standards, visit this Web site:

<http://books.nap.edu/html/nses/html/overview.html#content>.

This discussion guide addresses the following national standards:

- Systems, order, and organization
- Evidence, models, and explanation
- Constancy, change, and measurement
- Evolution and equilibrium
- Form and function

National Council for the Social Studies

The National Council for the Social Studies (NCSS) has developed national standards to provide guidelines for teaching social studies. To view the standards online, go to

<http://www.socialstudies.org/standards/strands/>.

This lesson plan addresses the following thematic standards:

- Time, Continuity, and Change
- People, Places, and Environments
- Individuals, Groups, and Institutions
- Power, Authority, and Governance

