Endemic and Introduced Species
Lesson Plan

**Grade Level:** 6-8  **Curriculum Focus:** Ecosystems and Biomes  **Lesson Duration:** Two class periods

**Student Objectives**

- Understand and apply the term *endemic* to animal and plant life, meaning “native,” or “restricted to certain geographical areas”
- Investigate how *introduced* species, or animal and plant species not endemic to a certain area, can endanger local endemic species

**Materials**

- Discovery School video on unitedstreaming: *Galapagos: Beyond Darwin*
  Search for this video by using the video title (or a portion of it) as the keyword.

  Selected clips that support this lesson plan:
  - Galapagos: Beyond Darwin
  - The World that Darwin Never Saw
  - Fires of Creation
  - Introduced Species

- World map clearly showing Galapagos Islands
- Pictures of the Galapagos Islands and of some of the animals endemic to the islands (e.g., giant tortoises, iguanas, blue-footed boobies)
- Research materials on the Galapagos Islands
- Research materials (e.g., a field guide or materials available from your state department of agriculture) on plant and animal species in your area
- Computer with Internet access
- Materials needed to create a garden of endemic plants on the school grounds or elsewhere

**Procedures**

1. Locate the Galapagos Islands on a world map so that students can clearly see where they are located (in the Pacific Ocean about 600 miles, or 970 kilometers, west of Ecuador).
2. Show students pictures of the Galapagos and of some of the unusual animals that live there, such as giant tortoises, iguanas, and blue-footed boobies.
3. Review with your students what they know about the Galapagos Islands and their significance. Be sure they know that Charles Darwin visited the islands in 1835 and studied the animal life there. He was particularly interested to observe how animal species had adapted, over a long period of time, to conditions in an isolated part of the world.

4. On the chalkboard, write the terms endemic and introduced. Explain that endemic species of animals or plants are those that are native to certain geographical areas and restricted to those areas. Tell students that the animals in the pictures they have just seen are endemic to the Galapagos Islands. Then explain that introduced species are those brought into an area where they would not naturally exist.

5. Discuss with the class the possible effects of introduced species on endemic species, making the point that introduced species can actually endanger species endemic to a particular location. For example, certain introduced plants, also called “invasives,” can take over an area and crowd or choke out native plants. Another example to consider is an introduced animal species that preys on endemic animal species or occupies the habitat of endemic species.

6. Go on to explain that, in the Galapagos Islands, introduced species are presently endangering endemic species.

7. Using research materials such as field guides, help students identify species of plants and animals endemic to your area. Help students find out what conditions might have allowed some plants to become endemic. (Your state department of agriculture can be a help.)

8. Have students list as many endemic plants as they can.

9. With the class, use the research students have done to plan a garden of plants endemic to your area. Plans should include how to keep introduced, or invasive, species out of the garden.

10. As a class project, create an endemic garden on the school grounds or on a nearby available plot of ground.

Discussion Questions

1. How did Darwin's work aboard the Beagle differ from the way scientists today work aboard the Steward Johnson?

2. Why are island populations so important in the study of animal adaptation?

3. What is meant by evolution through natural selection?

4. Many people believe, incorrectly, that the phrase "survival of the fittest" means only the strong survive. What does "survival of the fittest" really mean?

Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- 3 points: Students are active in class discussions; show a strong understanding of endemic and introduced species, and the dangers presented by introduced species; identify several species of
plants and animals endemic to your area; work cooperatively in their groups to plan an endemic garden.

- 2 points: Students participate in class discussions; show a satisfactory understanding of endemic and introduced species, and the dangers presented by introduced species; identify some species of plants and animals endemic to your area; work well in their groups to plan an endemic garden.

- 1 point: Students do not participate in class discussions; show a weak understanding of endemic and introduced species, and the dangers presented by introduced species; identify few or no species of plants and animals endemic to your area; do not work well in their groups to plan an endemic garden.

**Vocabulary**

**adaptation**

*Definition:* In biology, the process by which a living organism adjusts to its environment.
*Context:* Evolutionary adaptation does tend to make species better at surviving.

**archipelago**

*Definition:* A group of scattered islands.
*Context:* This is the newest edition to the Galapagos Islands, as the archipelago itself continues to grow.

**evolution**

*Definition:* The biological theory that existing living organisms have developed from previously existing organisms through a process of gradual change and modification.
*Context:* As a paleontologist, he has done extensive work on the evolution of land life on the Galapagos.

**fossil**

*Definition:* The term used to describe the remains of a plant or animal, usually imbedded in the earth's crust, of a past geologic age.
*Context:* The tortoise specimen is really important because it is the oldest tortoise fossil found from the Galapagos.

**natural selection**

*Definition:* The biological process in which organisms adapt to a changing environment by a gradual alteration of hereditary characteristics, leading those organisms that successfully change to increase their chances of survival in succeeding generations.
*Context:* Through natural selection, marine iguanas separated from the land iguanas and became a new species.
niche

Definition: A place, position or activity for which a person or organism is best suited.
Context: A specialty provides a competitive advantage or allows them to move into a niche where less competition exists.

species

Definition: A biological classification category comprising related organisms potentially capable of interbreeding.
Context: Scientists have discovered many new species in the Galapagos.

Academic Standards

National Academy of Sciences
The National Science Education Standards provide guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K-12. To view the standards, visit http://books.nap.edu.

This lesson plan addresses the following science standards:

- Life Science: Diversity and adaptations of organisms

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 — Earth Science: Understands Earth's composition and structure.
- Science — Life Science: Understands biological evolution and the diversity of life.
- Science — Life Science: Understands relationships among organisms and their physical environment.
- Science — Nature of Science: Understands the nature of scientific knowledge.
- Science — Nature of Science: Understands the nature of scientific inquiry.
- Technology: Understands the relationships among science, technology, society, and the individual.
Support Materials

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- [http://school.discovery.com/teachingtools/teachingtools.html](http://school.discovery.com/teachingtools/teachingtools.html)