

Lab: Endangered Species

(modified from Holt Environmental Science)

Part One Activity: Create a double line graph using the two sets of data below. Without knowing what the two tables are showing, answer the three questions below.

Table A	
1650	550
1700	610
1750	760
1800	950
1850	1210
1900	1630
1950	2520
2000	6000
2050	9700

Table B	
1650	5
1700	9
1750	7
1800	12
1850	27
1900	70
1950	124
2000	798
2050	1500

Part One Analysis Questions:

1. How are the two graphs similar?
2. What might the two lines on the graph represent?
3. Explain what would happen to each line if the current trend continues?

Part One Background Information: The data in Table A represents the human population of the world, in millions. The data in Table B represents the number of birds and mammals that became extinct during each 50-year period. It is important to note that these are only the species known to have become extinct during that time. There may have been others that we do not know about. It is also very important to keep in mind that these are only the birds and mammals. Reptiles, fish, amphibians, insects, and plants are not included in the data. Loss of plants and insects can be especially important to ecosystem and, most likely, to mankind. No doubt you noticed that the rate of species loss has accelerated along with the growth in human population. This makes sense, because as human populations grow they will have more and more impact on their ecosystems. Species have been becoming extinct for as long as organisms have been evolving on the earth. Some scientists estimate that the average rate of vertebrate extinctions over the last 200 million years has been about 90 species per century or slightly less than one per year. The data in the table shows that in the 50 years between 1900 and 1950, about 124 species of birds and mammals became extinct. When other vertebrates are included, it is easy to see that the rate of vertebrate extinctions has nearly tripled the historical average. The data is even more alarming when one considers plants and invertebrates. Some scientists estimate that we are losing at least one species per day. The loss of plants is especially important because many animals are dependent on specific species of plants, so if the plant becomes extinct so will some species or animals. There are even estimates that the annual rate of loss may accelerate and we could lose 50% of all species by the year 2100. There are several reasons for this alarming loss of species. Even today, some species undoubtedly become extinct due to “natural causes,” but most are due to human activities. Some of these human activities include habitat loss, pollution, commercial & sport hunting, competition with invasive species, pest control and the pet trade. It is important to realize that many extinctions are caused by combinations of these factors. Also, the percentages and causes may change with time.

Analysis Questions:

4. Does the data in Tables A and B prove that the increase in extinctions is due to the increase in human population?
Explain your answer.
5. Why do you think statistics were given for birds and mammals, rather than some other kinds of organisms?
6. Habitat degradation is a very important part of the species endangerment and extinction problem. List several ways that humans degrade the natural habitat.

7. For each of the following causes of extinction, provide a specific example and discuss how increases in human population make the problem worse.
- a. habitat loss and degradation
 - b. pollution
 - c. commercial & sport hunting
 - d. competition with invasive species
 - e. pest control
 - f. pet trade

Part Two Background Information: Many people have heard about endangered species such as the red wolf, African elephant and polar bear. Most would agree that it would be nice to help protect these species. But what about small species or plants and animals such as fish, snails and insects? What about the species that you will never actually see? One reason to preserve species is because they may have economic or medical importance to us. Many of the products that we use every day are made from plant and animal products. New uses for plants and animals are found daily. Many medications are made from plants. Some of the species that people have utilized for years are endangered. A species that has not even been discovered yet may yield an important new product, food or medicine. Wild species of plants and animals also provide us with a genetic insurance policy. For example, there are over a hundred varieties of corn, but almost all of the corn grown for human consumption comes from less than ten varieties. If a disease or some other problem reduces the ability of those few varieties to produce food, we will need to have the genetic diversity provided by the other varieties. Biodiversity is becoming increasingly important to us. Wild plants and animals provide a source of beauty, wonder and joy for millions of people. To lose the great diversity of life on Earth impoverishes all of us for aesthetic reasons as well as practical ones. In addition to the purely aesthetic values of wildlife, many species have recreational value. Hunting, fishing, bird watching, photography and other recreational uses of wildlife are enjoyed by millions of people. As scientists try to learn more about life on Earth, about ecology and evolution, about botany and zoology, they study the organisms living in various ecosystems. Every species in an ecosystem has a particular role or niche, and the loss of a species reduces our ability to learn from it. Every species of life on Earth has purely scientific and ecological value in addition to whatever other value it may have. Biodiversity is important to all organisms.

Part Two Activity:

Assume that you are a wealthy philanthropist who has the money to save endangered species. You have only enough money to save one of the species below. Number the plants and animals in the order that you would save them. Use #1 for the species you would save first. After each member of your group has selected his or her personal priorities, discuss your choices and come to consensus agreement on the team priorities.

Part Two Analysis Questions:

8. Did any patterns emerge in your team priorities (did certain species routinely get selected to save)? Why or why not?
9. Why is it important to save plant species?
10. Why is it important to save invertebrate species?
11. List three reasons to protect species that you may never actually see.
12. What is biodiversity and why is it important?
13. What are some ways that you can help protect species of plants and animals?
14. The resources to protect species are limited. How should limited resources be used to maximize the effectiveness of conservation efforts?

Endangered Species	My Priority	Team Priority
Apache Trout		
Arizona Cliff Rose		
Leopard Lizard		
California Condor		
Carrion Beetle		
Oahu Tree Snail		
Pitcher's Thistle		
Polar Bear		
Red-Footed Tortoise		
Swallowtail Butterfly		
Blind Salamander		
Wyoming Toad		