



10th - 12th Grade EdZoocalational Adventure Guide

Theme: World Wide Web

Grade level: 10th-12th

DESE Standard: BI-LS4-5: Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals in some species, (2) the emergence of new species over time, and (3) the extinction of a species.

Overview: The environment of a species may be changed by nature or human. Both types of change can create variation in species population. The changes could prove favorable, and a species thrives, resulting in more offspring being produced or surviving to adulthood. The changes could favor only individuals of a species with a certain trait. Only the individuals with that trait survive to pass on the trait to future generations, until the entire species now has the adaptive trait. The changes could prove entirely unfavorable to a species and an entire species could be lost. Primates of the world are only found around the equator, typically, from the Tropic of Cancer to the Tropic of Capricorn. There are 376-524 different species of primates (depending on how you classify them) with more being discovered every year. With all the primate species living in tropical areas, this variety can only be explained by the environmental impact on each species. Various threats have affected the species populations independently, thus resulting in distinct species within a similar habitat. Some thrive, some adapt, and some die.

Activity: The activity page provides students with a brief description of three species found at Little Rock Zoo. Using this information (or allowing for further research in class), allow students to determine what possible effect the listed threat might have on each species.

Activity Extension: Research and discuss how humans might diminish each of the listed threats. Are there any human impacts responsible for these threats, even those considered natural disasters? Consider how Arkansans might help species in other nations.

10th - 12th Grade Tour Guide

This self-guided tour takes your class along a path to exhibits with primates from around the world. This path does not cover the entirety of the zoo but is meant to accentuate the lesson narrative.

- As you enter, head toward the left, past the dome. The lemurs are on the right.
- Remind students that calm, quiet guests see more animals. Loud noises send them into hiding, making them harder to find.
- **Siamangs:** Siamangs are the largest species of gibbon, a lesser ape. Siamangs like Crash and Sutera are found in the mountain and lowland forests of southeast Asia. They are arboreal and live in areas dense with leaves and figs. Their two biggest threats are habitat loss and capture for the illegal pet trade. With these combined threats, siamangs are considered endangered.
- **Gibbons:** White-handed gibbons like Paddy, Murphy, Goblin, and Twila live in the tropical rainforests of southern and southeast Asia. Gibbons are an arboreal species of ape, inhabiting the canopies of a variety of forests within their habitat range. They face many threats including hunting, collection for the pet trade, and deforestation. Being an arboreal species, living in canopies becomes problematic when trees are cleared for human development, including roads. Due to these threats, gibbons are labeled as endangered.
- **Colobus and Guenons:** Angolan colobus monkeys and spot-nosed guenons both face many threats living in Africa. Guenons are an arboreal (tree-dwelling) species that are found on the west coast of Africa. Colobus monkeys primarily live in the canopies of the trees and are the most arboreal African monkey. They can live in various areas from the savannas to the swamplands. Colobuses are vulnerable from a variety of threats, including hunting for their beautiful fur. Guenons are near threatened from a variety of threats, including capture for the pet trade and hunting for bush meat.
- **Pygmy Slow Lorises:** Pygmy slow lorises are found in southeast Asia. Their habitat ranges include rainforests, evergreen forests, and bamboo plantations, areas with an abundance of leaf coverage. Being the only venomous primate, pygmy lorises are hunted heavily for medicinal uses. Some believe that their venom can help heal broken bones, open wounds, and even injuries during childbirth. With the combination of the illegal pet trade, hunting, and habitat loss, pygmy slow lorises are endangered.
- **Chimpanzees:** Western chimpanzees live in western Africa in open grasslands mixed with forests. Chimpanzees face many threats including deforestation, poaching, and disease. One of their biggest threats is poaching for bushmeat (the meat of African animals). This combination of threats makes the western chimpanzee critically endangered.
- **Gorillas:** Western lowland gorillas can be found inhabiting the dense and remote tropical rainforests and the isolated lowland swampy forests of western Africa. Gorillas face many threats including poaching, deforestation, climate change and disease. Human diseases like Ebola are catastrophic to gorillas. Disease, combined with poaching, has produced a 60% decline in gorillas over the past 25 years, leaving them critically endangered.
- **Lemurs:** Lemurs face extensive threats in their habitat as they are only found off the continent of Africa, on the island of Madagascar. Blue-eyed black lemurs and black and white ruffed lemurs are both critically endangered and rely heavily on the tropical forests that Madagascar provides. Ring-tailed lemurs are more flexible in their habitat, ranging from forests to rock canyons, but remain endangered. Lemurs face a variety of threats, particularly slash-and-burn agriculture, which is burning large areas of trees for planting crops. They estimate that every year $\frac{1}{3}$ of Madagascar burns due to this type of farming.

Name: _____



How Animals Respond to Threats

Instructions: After your visit at the Little Rock Zoo, use the chart below to research how some of the animals you encountered would respond to threats in the wild.

Threat:	Gorillas	Gorillas	Pygmy Slow Loris
flood	seek higher ground - not strong swimmers		
drought	travel outside home range to find food and water		
deforestation	forced migration, groups would be fragmented, impacting genetic diversity		
global warming	adapt to new habitats and diets		
disease	self isolate to reduce spread of disease		
hunting	aggression, group may scatter, affecting group's protective structure		
human-wildlife conflict	avoidance, retreat, aggression, group dispersal		

Connection: Pick a local animal and think about that animal's biological history. Consider how each threat might affect that animal. Write a summary on the back of this page.