Where Have All The Animals Gone?

Teacher’s Guide
WHERE HAVE ALL THE ANIMALS GONE?
Endangered Animals

TEACHER’S GUIDE

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Special Thanks to:
Busch Gardens
Tampa, Florida

Published and Distributed by

AGC/UNITED LEARNING
1560 Sherman Avenue
Suite 100
Evanston, IL 60201
1-800-323-9084
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ENDANGERED ANIMALS

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Endangered Animals

Viewing Time: 25 Minutes

INTRODUCTION
This video production is intended for use in grades 4 - 8. There is much concern today about endangered animals and the effect humans have had on nature. Throughout the history of life on this planet, there have been an unbelievable number of species that have come and gone. In fact, extinction is a natural process. It is a part of evolution and adaptation. However, scientists have concluded that before humans, species probably became extinct at the rate of one every 1000 years. Humans have had such a profound effect on nature that this rate has been greatly changed. It is important for humans to take control of the situation and ensure that plants and animals will be protected and revered.

PROGRAM OBJECTIVES
After viewing the video and participating in the various activities, the students should be able to...
• Describe the relationship of individual species to the environment.
• Distinguish between prey and predator.
• Define terms such as niche, habitat, carnivore, herbivore, and omnivore.

SUMMARY OF THE VIDEO
This video is designed to help students understand the concepts of endangered and extinct species. Much vocabulary is presented and defined, as well as concepts related to food pyramids, chains, and webs. Attention is given to many endangered animals. Their story is told as each is used to illustrate the major causes of animal endangerment and extinction: habitat destruction, poaching, exotic pet trade, human population growth, over-hunting, and pollution.
Humans are the greatest cause of animal extinction today. We have caused a great deal of harm, but we have the power and potential to try and correct things.

**TEACHER PREPARATION**

We suggest you view the video before you present it to your students in order to become familiar with its content. Then review the blackline masters that are provided and duplicate those you think will be helpful. As you review the instructional materials in this program you may find it necessary to make some changes, deletions, or additions to fit the specific needs of your class. Feel free to do so, for only by tailoring this program to your students will they obtain the maximum instructional benefits afforded by the materials. An answer key for the blackline masters is provided in this guide.

**BLACKLINE MASTERS**

_Vocabulary Match_ is a good way to help reinforce the vocabulary presented in the video. Students are to match the definitions in column B with the terms in column A.

_Wisdom From The Past_ is an activity that contains a short but important quote from Chief Seattle concerning the behavior of white men as they moved west across America. The statement was made in 1854, but illustrates the attitude many white men had about the use of nature.

_Animal Project_ asks students to choose an endangered animal and research it for some kind of presentation to the class. Some ideas are presented on the activity sheet for ways to share the information.

_Some Things To Think About_ is an activity requesting some thoughtful reaction to the main causes of plant and animal extinction.
Decaying Log is an experiment for investigating a community in its natural environment. Caution students to be very careful not to disturb this habitat to such a degree that it is no longer suitable for the plants and animals that depend on it. They should just use the knife to peel back some of the bark to see evidence of organisms within the log. They should not cut into the log and cause it to fall apart.

Exponential Growth provides a classic example of how numbers can grow exponentially. Students will need a calculator to help with this activity.

INTRODUCING THE VIDEO
Students are typically very concerned about animal extinction. They may not be aware of the fact that the greatest threat to plants and animals today is human activity. Ask students to think of some of the things humans do that cause problems for the other organisms that share this planet with us. Make a list on the board. Habitat destruction, poaching, over-hunting, pollution, and human population growth are all contributing to the extinction of plant and animal species.

FOLLOW-UP DISCUSSION
Be sure students understand the terms endangered and extinction. Talk about how throughout history plant and animal species have gone through changes called adaptations. These adaptations are important to the survival of a species. The individuals of a plant or animal species that are able to adapt to changing environments will be the healthy ones that survive to reproduce and pass on the traits that help them to be successful. The ones that can’t adapt are more likely to die out. Before humans began to affect things in nature, it is estimated that species became extinct at the rate of one per thousand years. Humans have greatly altered that rate as illustrated with the fact that during the past 500 years 200 native plants of America have become extinct.

Discuss some of the ways humans can change some of the damage caused by human activity.
***ANSWER KEY***

- **Vocabulary Match**
  1. C
  2. I
  3. F
  4. J
  5. E
  6. H
  7. B
  8. D
  9. A
  10. G

- **Wisdom From The Past**
  Answers will vary but should include ideas related to how careless white men had been when it came to interacting with nature. Indian culture was based on respect for nature and an understanding of the interrelatedness of all living things. Indians only killed what they needed for food and clothing. They made use of as much of a kill as possible, fashioning weapons and utensils from animal bones. Humankind today has not had the same level of respect and caring for nature.

- **Animal Project**
  Students will want to use the library and other resources to find out as much as they can about their selected endangered animal.

- **Some Things To Think About**
  1. One way to combat food shortage in the world would be to eat more grains and beans because these are found at the lowest level of the food pyramid. Plants are at the first, or lowest, level on the energy pyramid. They are the producers because they can make their own food from sunlight and nutrients provided by the soil. They also need carbon dioxide which is exhaled by animals. If humans would change their diets to include more first level members, this would help the food shortage situation.

  2. Answers will vary.
- **Decaying Log**
  Have students share their notebooks and sketches.

- **Exponential Growth**
  The option that begins with a penny the first day and then doubles to two pennies the second day and so on is actually the best deal. Numbers that grow exponentially start out slow but then increase at an incredible rate. By the thirtieth day the total is $5,368,709.12. Here is a breakdown day by day for this activity:

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ORGANIZATIONS TO CONTACT

Greenpeace, USA
1436 U St., NW
Washington, DC 20039

National Wildlife Federation
1400 16th St., NW
Washington, DC 20036

Rain Forest Action Network
301 Broadway, Suite A
San Francisco, CA 94109

The Sierra Club
730 Polk St.
San Francisco, CA 94109

World Wildlife Fund
1250 24th St., NW
Washington, DC 20037
WHERE HAVE ALL THE ANIMALS GONE?
Endangered Animals
VIDEO NARRATION

This is the planet earth. It is a very special place. It is a living planet that is undergoing constant change. Five billion years ago the earth formed along with the other planets of our solar system. It was made up of the gasses and debris left over from the sun’s formation. The earth went through millions of years of formation which included much upheaval and volcanic activity.

A vast number of plants and animals have come and gone on this planet. The fossil record dates back about three-and-a-half billion years and shows that a wide variety of plant and animal types have existed at one time or another on earth. When an animal or plant species can no longer live successfully, it dies and becomes extinct. This is a natural occurrence in nature and has been happening throughout the earth's history. However it has been estimated that natural extinction, in the past before man's influence, averaged about one species per thousand years. Since the colonization of America 500 years ago 200 plants native to America have disappeared forever. That’s how long extinction is, forever. It means a plant or animal will never be seen on our planet again.

Living things are dependent upon their environment and other animals and plants for survival. Ecology is the study of how plants and animals interact with each other. All living things have a special place in the ecology called their niche. This niche includes everything about where the animal lives, which is called its habitat. Examples of habitats could range from the hot, dry desert floor or the cold dark waters of the ocean. In addition, what it eats, how much moisture it requires, how it reproduces, how much space it needs, and everything else that is necessary for that animal’s way of life.
Niches can be very broad or very specific. For instance, a rat can live in a variety of locations, from city sewers to barns on a farm. Their diet includes a wide range of things, from garbage in the street to grains in the field.

Koala bears are animals that have a very limited diet. They live in eucalyptus forests of Australia and feed on the leaves and bark of these trees. These quiet animals were once endangered because of destruction to the forests they depend on. Their ecological niche is limited.

Life exists from the bottom of the oceans to high in the atmosphere. This area is called the biosphere. The biosphere is divided further into ecosystems. These are areas where a variety of plants and animals interact and support each other.

There are many types of ecosystems, like deserts, forests, and jungles. They can be huge and complex or as simple as a backyard garden. The important thing is that the plants and animals within the ecosystem depend on each other for survival. The plants use sunlight, water, and nutrients from the soil to produce energy for their own growth and development. Green plants in return release oxygen into the air. The oxygen is critical to the survival of animals. Animals use the oxygen and release carbon dioxide, which is an important part of the plants’ food-making process.

Some animals, who are called herbivores, feed on the plants directly for their nourishment. Other animals are carnivores who hunt and feed on other animals. And some animals, known as omnivores, will eat either plants or animals to gain their needed energy. Scavengers are animals that eat only dead organisms.

These animals and plants interact with each other and form what is called a community. Nature maintains a balance between these community members and each one plays an important role. Plants produce their own food and are called the chief producers. An animal that eats plants is called a primary consumer.
that eats the plant-eating animal is called a secondary consumer. The energy produced by the plant through its food-making process is transferred to the plant-eating animal and eventually to the meat-eating animal.

This is an energy pyramid, with the producers at the base, primary consumers higher up, and secondary consumers at the top. The pyramid shape is used to indicate that at the base there must be a large population of plants to support a much smaller number of primary consumers. Also at the top of the pyramid is an even smaller number, often one secondary consumer, that depends on the organisms at the other levels for survival.

Food chains show how different plants and animals relate to each other in the exchange of energy. Ecosystems contain more than a single food chain and there is often overlap between food chains, as many consumers can eat a variety of things. As a result, food webs are used to show how organisms within an ecosystem interact through more than one food chain.

The balance in nature between organisms is critical for survival. If the secondary consumer dies out or moves away, then the primary consumers have no predator or enemy. If too many coyotes are killed, then the jackrabbit population surges. Now there are too many of these plant eaters and the supply of plant food available is adversely affected. If this continues, the plants may disappear causing the animals to die or move to a new location. The members of the energy pyramids actually are of benefit to each other. They help maintain the delicate balance of nature.

The “predator” is an animal that hunts and feeds on other animals. The animals these predators hunt are called prey. This is important because nature uses a process called evolution to help different species change with changing environments and conditions.

Usually changes in climate take place over a long period of time so plants and animals can change gradually. In
the case of predators and prey, evolution plays an important role in the success or failure of a species. Prey that are too slow or not careful and alert about their surroundings can become victims. Those that are sickly and unhealthy will be caught and eaten by predators. Also the prey that are alert and respond quickly to dangerous situations, and the ones that are healthy, clever, or fast will escape. Those valuable traits will be passed on to their off-spring.

The predators also must change over time to be able to hunt and feed. If the predators don't evolve they will die as well.

As mentioned before, extinction is a natural part of the animal and plant kingdoms. Unfortunately plants and animals are becoming extinct today at a much higher than normal rate. It is true that there have been times in the history of our planet where large numbers of species became extinct over a short period of time. One of the most famous mass extinctions happened 65 million years ago when the dinosaurs, and maybe as much as 65 percent of the species living at the time, vanished. Scientists don't know why this happened, but it is likely that some giant disaster occurred--possibly asteroids colliding with the earth or tremendous volcanic activity. This type of mass extinction may have happened five or six times throughout all the billions of years of life on this planet.

Today the greatest cause of plant and animal extinction on earth is from humans. Humans are changing the face of the planet at an alarming rate. We are eliminating ecosystems throughout the world and threatening the very existence of a huge number of plants and animals.

There is no way for us to know how many different kinds of species inhabit the planet with us. Estimates range from three to ten million different species. Humans have described about 1.5 million of these species, which means
there are so many more that should be identified and studied.

Much of our understanding of medicine has come from the plant world. Twenty-five percent of the drugs used to fight disease come directly from plants. As much as we need and use these plants, only five percent of them have been studied for use as medicines. The solution to many health problems may be on the brink of extinction.

Plants and animals have been evolving throughout time. As the earth’s environment changes, so do the organisms that live on our planet. The environment changes slowly except for the few dramatic catastrophes, such as the one that caused the extinction of the dinosaurs. When ecosystems change slowly, the plants and animals have time to adapt. The ones that adapt and change to fit the new environmental conditions are the ones to reproduce and pass on favorable characteristics to their offspring.

Man has interfered with this process in a number of different ways. Man changes the world faster than plants and animals can adapt, so species suffer and die out. Humans are the major cause of extinction today. Habitat destruction is one of the greatest causes of plant and animal extinction. As the human population grows, more and more land is transformed from its natural condition to farms, ranches, home developments, streets, cities, and more.

A major loss to the planet is the destruction of our rain forests. Rain forests cover only seven percent of the earth, but they are home to more than half of the various types of plant and animal species.

Rain forests also influence the earth’s climate. The forests release a great deal of oxygen and moisture into the atmosphere, which helps them grow thick and rapidly.
Unfortunately forests are being cleared to make room for cattle ranches. Forty to fifty million acres a year are cleared for this purpose. This represents an area equal to the size of the state of Washington. An additional problem is that the soil of a rain forest is not very rich, so crops can only be raised for a year or two and then the land is useless. Farmers then move on to clear new areas and the land is left as a dry landscape. It will not grow back as a forest because all was destroyed when the land was cleared to grow crops.

Another major problem created by humans is the over-hunting of animals. Throughout human existence animals have been hunted for food, skins, hides, and even for sport.

An example of a species nearly wiped out by over-hunting is the American buffalo. American Indians hunted buffalo for meat and hides long before the white men moved out west. The Indians only killed what they needed. They respected nature and tried to fit in as a member of the ecosystem. However, during a 200 year period of time from 1700 to 1900 white hunters caused the near extinction of this powerful animal. At first they were hunted for food and hides, but eventually they became hunted for sport. The millions of buffalo that once roamed the prairies of the west were reduced to just a few dozen animals. Fortunately it was realized that these animals required protection from humans, and today they are again found in large numbers.

The problem would never have happened in the first place if hunters hadn’t decided to hunt these animals for sport. People who hunt animals illegally for profit are called poachers. The hide, bones or other body parts of certain animals may be considered valuable in some societies and high prices are paid to get these animal parts.

In 1989 a ban was established to try and stop the trade of ivory which came from the tusks of elephants. Between 1979 and 1989 the number of elephants in
Africa dropped from 1.5 million to around 700,000 due to the high demand for ivory. In just ten years, more than half of the African elephants had disappeared. Two hundred elephants were being killed each day in 1989. The ban on ivory trade has helped, but there is still a problem with poaching.

The black rhino is an endangered species because of its horn. Some countries believe that the horn makes a great medicine and it is also used as the handle for knives.

An animal is considered endangered when its population has become so small that it is in danger of becoming extinct. Some other endangered species are lowland gorillas, who live in certain areas of Africa. Their habitat is being destroyed and used as farm land. The gorillas are sometimes killed because of the damage they cause to crops. Poachers hunt the gorillas and sell the animal's head and feet as souvenirs.

The Bengal tiger and the rare white Bengal tiger are found in India. In the early 1900's there were more than 40,000 tigers in India, but by the 1970's there were less than 1800. Hunting and the sale of their valuable skins nearly wiped them out. However since 1972 the Indian government has set up a number of reserves to provide complete protection for these beautiful animals. Because of this protection, the tiger population has doubled in the past twenty years to over 4,000.

The walrus who lives in a very isolated area of the earth was almost eliminated in the early 1900’s. People hunted them for their ivory tusks and their blubber which was used to make oil. The walrus is only legally hunted by Alaskan natives who need the walrus for food and clothing.

Another animal that lived in what might have seemed to be a protected isolated area is the polar bear. They are threatened by low-flying planes which make it easy for hunters to find them and shoot these magnificent
animals. Illegal hunting and water pollution have hurt the polar bear population also. These animals have special adaptations to help them survive in the harsh conditions of the arctic region. They have hollow hair all over their body that traps air and keeps them warm just like the insulation in a house. The hair of a polar bear is white but the skin is black so the skin can absorb heat from the sun. The feet of the bear are covered with dense hair even on the soles of their feet. This helps to insulate them from the ice. The forepaws are even slightly webbed to help in swimming.

Closer to home in the United States there are animals that are endangered. In fact the symbol of our country, the bald eagle, was on this list from 1978 to 1994.

By the way, the term bald meant something different back in colonial times. Back when the bald eagle was named, the term bald meant white. You can see why the eagle was given this name when you see its beautiful white head and neck area.

Eagles were hunted, poisoned by DDT and other pollutants, and generally hurt by human population growth. DDT was a chemical used to kill insect pests. It got into the eagles and caused their egg shells to be weakened. In 1972 the chemical was banned. In 1994 the population of mating eagle pairs rose to over 4000 and the status of this magnificent bird was changed from endangered to threatened.

The American crocodile is endangered. There are only 50 known mating pairs. The American alligator was also on the endangered species list until 1987.

The alligator of the American south is a good example of how some animals actually impact an ecosystem to a greater extent than other species. The alligator digs a hole called a “gator hole,” which is a small pond that becomes home to far more animals than just the alligator. During dry spells the gator hole may be the only place in a swamp where there is water, so other
animals depend on the gator hole. Species such as plankton, bass, bullfrogs, otters and many others could not survive during times of drought if the gator holes were gone.

Manatees are a wonderfully peaceful species that feed on water plants. Moving slowly with grace and ease, these huge animals spend all their time in the water. They are in danger because of the propellers of speed boats. These animals can’t get out of the way of fast moving boats and because they feed in shallow areas, the blades can cause great damage by cutting into the skin and tissues of the manatee.

People must learn to respect the areas where manatees feed and slow their boats to avoid hurting any of these terrific animals. They serve an important role in feeding on the weeds that often clog canals and dams. People who have had a chance to see these marvelous creatures close up will understand how important it is that humans do whatever they must to protect these animals.

That brings up an important point about some of the things people are doing to help animal species of all kinds. Establishing laws to protect animals is obviously an important step.

Another important aid to species survival is the establishment of protected reserves and zoos where the animals can live safely and have a chance to build up their numbers. The buffalo would have been hunted to extinction if a group of people hadn’t stepped in and set up a protected reserve area for the few that were left. Places like Busch Gardens are committed to preserving animal species. Most animals in these special parks are kept in areas that resemble their natural habitat. This is much more costly than the traditional cages found at many zoos, but in the long run it is best for the animals and it gives visitors an opportunity to really appreciate the varied ecosystems of the world.
That brings up another important reason why places like Busch Gardens are so important: they educate people. People have a chance to see these wonderful animals that share this planet with us. People can appreciate the grandeur of nature and possibly understand why it is so important for humans to do the right thing when it comes to interacting with other species.

Humans have made many mistakes and have done a great deal of damage to the natural world, but humans are also capable of correcting mistakes and ensuring a safe and healthy existence for all of nature’s creatures. It’s up to everyone to do their part.

THE END