

ESPN CRIB (ENDANGERED SPECIES PROTECTED NOW)

GRADES 5-12

JODALE ALES

TIME ALLOTMENT:

Approximately 2 - 3 (50-minute) class periods.

OVERVIEW:

Through inquiry student groups will research the habitat of a threatened or endangered animal species and design and/or build a model of a naturalistic habitat for a zoo exhibit. The goal is for the students to create a zoo exhibit that will benefit the animal and is also accessible to zoo visitors. The activities are focused on learning about zoos, natural habitats, threatened and endangered species, and human contributions to increasing the numbers of these animals.

SUBJECT MATTER:

Life Science, Biology,
Environmental Science

LEARNING OBJECTIVES:

Students will be able to:

- Research information and apply what they learn.
- Solve a real world problem by designing and/or constructing a model of an accurate naturalistic habitat for a zoo exhibit.
- Demonstrate an understanding of basic needs of threatened and endangered species, carrying capacity, limiting factors, habitat destruction, extinction, modern zoos, and recovery efforts to increase the numbers of threatened and endangered animal species.
- Communicate their model to others visually and orally.



STANDARDS:

National Science Education Standards

<http://www.nap.edu/readingroom/books/nses/html/>

Unifying Concepts and Processes

- Systems, order, and organization
- Evidence, models, and explanations

Science as Inquiry

- Abilities necessary to do scientific inquiry

Life Science

- (5-8) Populations and ecosystems
- (5-8) Regulation and behavior
- (5-8) Diversity and adaptations of organisms
- (9-12) Interdependence of organisms
- (9-12) Behavior of organisms

Science and Technology

- (5-8) Abilities of technological design
- (9-12) Abilities of technological design

Science in Personal and Social Perspectives

- (5-8) Populations, resources, and environments
- (5-8) Science and technology in society
- (9-12) Science and technology in local, national, and global challenges

Excellence in EE—Guidelines for Learning

http://naaee.org/npeee/learner_guidelines.php

Strand 1: Questioning and Analysis Skills

Guidelines:

- A) Questioning
- C) Collecting information
- D) Evaluating accuracy and reliability
- E) Organizing information
- F) Working with models and simulations
- G) Developing explanations

Strand 2: Knowledge of Environmental Processes and Systems

2.2: The Living Environment

Guideline:

- A) Organisms, populations, and communities
- C) Systems and connections

2.4: Environment and Society

Guideline:

- A) Human/environment interactions
- D) Technology

Strand 4: Personal and Civic Responsibility

Guideline:

- D) Accepting personal responsibility

Louisiana Science Frameworks:

State Standards for Curriculum Development

<http://www.doe.state.la.us/doe/assessment/standards/SCIENCE.pdf>

SI-M-A1: Identifying questions that can be used to guide a scientific investigation;

SI-M-A5: Developing models and predictions using the relationships between data and explanations;

SI-M-A7: Communicating scientific procedures, information, and explanations;

SI-M-A8: Utilizing safety procedures during scientific investigations

Science as Inquiry: 9-12

SI-H-A1: Identifying questions and concepts that guide scientific investigations

SI-H-A5: Recognizing and analyzing alternative explanations and models

SI-H-A6: Communicating and defending a scientific argument

SI-H-A7: Utilizing science safety procedures during scientific investigations

Life Science: 5-8

LS-M-C4: Explaining the interaction and interdependence of nonliving and living components within ecosystems

Life Science: 9-12

LS-H-D4: Exploring how humans have impacted ecosystems and the need for societies to plan for the future

Science and the Environment: 5-8

SE-M-A1: Demonstrating knowledge that an ecosystem includes living and nonliving factors and that humans are an integral part of ecosystems

Science and the Environment: 9-12

SE-H-D2: Analyzing how individuals are capable of reducing and reversing their impact on the environment through thinking, planning, education, collaboration, and action

SE-H-D4: Demonstrating a knowledge that environmental issues should be a local and global concern

SE-H-D6: Developing an awareness of personal responsibility as stewards of the local and global environment

MEDIA COMPONENT:**Video:****Enviro-Tacklebox™ — A Zoo View**

Louisiana Public Broadcasting, **Enviro-Tacklebox™** program
Louisiana Education Television Authority. 2000. (19:40 minutes)

Web sites:

Enviro-Tacklebox™ <http://www.envirotacklebox.org> This is Louisiana Public Broadcasting's Web site providing teaching information, streaming media, and student activities involving environmental science. RealOne Player is used to view the video and can be downloaded from the Web site.

American Zoo Association

<http://www.aza.org> provides information on zoo programs and its member zoos. Each zoo has its own web site where information on exhibits can be accessed.

MATERIALS:*Per Group:*

- Video: **Enviro-Tacklebox™—A Zoo View**
- Basic materials for taking notes and writing are needed.
- Student handouts are listed under Student Materials.
- **A Zoo View: Student Viewing Guide Answer Key** for the teacher.

PREP FOR TEACHERS:

1. Prior to teaching the unit, bookmark the **Enviro-Tacklebox™** Web site students will access and, if possible, put a link to it from your school Web site or provide a link on your course management site, such as Blackboard.
2. Download the RealOne Player needed for viewing the video online from the **Enviro-Tacklebox™** Web site.
3. Review the **Enviro-Tacklebox™** Web resources and the video related to **A Zoo View**.
4. Prepare copies of student handouts or post them electronically.

INTRODUCTORY ACTIVITY:

Introduce the lesson by facilitating a class discussion of student trips to the zoo. Ask the students to describe the zoos they have visited and describe their impressions of these zoos. Other thought provoking questions might include; “Why do we have zoos?” or “What are the pros and cons of zoos?”

LEARNING ACTIVITIES:

1. Provide students with a **Focus for Media Interaction**, asking them to watch the video to see if there are any additional natural disasters that can change the earth’s crust or affect the environment.

Video Viewing

- A. Help the students establish background knowledge of related science concepts by showing the **Enviro-Tacklebox™** video **A Zoo View**. Hand out the **video viewing guide**.
- B. **PLAY** the video. After each clip students will record their responses to questions on the **video viewing guide**. Pause the video and facilitate a class discussion after each clip.

Video Clip 1 – Greg begins the video by presenting some of the historical background on zoos. Next he travels to Zoo Atlanta that is a success story of how one of the worst zoos in the U. S. has become one of the best. The zoo curator points out the negative characteristics of Zoo Atlanta before its reform. These include “prison-like” settings, neglect and deprivation, small spaces, and concrete surfaces. Because of this deprivation the animals exhibited stereotyped, ritualistic behaviors like pacing back and forth. Innovative changes that were made include enlarging the facilities and the use of naturalistic landscapes. Naturalistic landscapes simulate the animal’s habitat instead of reproducing it exactly. Climate and other factors at the zoo location prevent all of the native vegetation from growing. The exhibits were set up so that visitors would seem close to the animals but the animals had more space in which to move about. These habitats were designed to help save many animals from extinction. This clip ends with a visit to the panda enclosure.

Video Clip 2 – The New Orleans Audubon Zoo is another zoo success story. Horticulturists, designers, and zoologists worked together to design the exhibits that focus on plants, animals, and zoo visitors. Mixing animals that cohabitate in nature creates a single exhibit that more closely simulates the natural habitat. The rhino exhibit also illustrates naturalistic landscapes that represent the area of the world where the animals live in the wild but does not duplicate it.

The concept of environmental enrichment is introduced in this clip. Environmental enrichment consists of anything that helps challenge an animal and gives it the opportunity to do more natural things. An example of enrichment is the boomer ball with which giant cats like tigers play. Their play simulates how tigers capture and subdue their prey in the wild. Primates are given T-shirts, cardboard boxes, and paper bags to stimulate them. The sea lion trainer uses training to build a relationship with the animals and physically and mentally stimulate them. Trainers take the elephants out of their enclosures and walk them around the park to vary their daily routine. At mealtime zoo keepers provide natural foods if possible and hide them so that the animals can hunt and forage. The clip ends showing how the Louisville Zoo uses animal rotation through different habitats throughout the day to stimulate instincts and expose the animals to a variety of foods and scents.

Video Clip 3 – This clip focuses on animal reproduction and how it is facilitated within zoos to help species survive. Nurseries are not as important today as they were once thought to be because zoo newborns have been found to do better in natural, family settings. North American zoos have species survival plans and veterinary clinics that help carry out these plans. The goal is to increase healthy zoo populations for future

generations and possible reintroduction into the wild. The Audubon Research Institute has a Center for Research of Endangered Species where assisted reproduction is used. Frozen zoos contain frozen genetic material contained in DNA, sperm and embryos. These embryo can even be transferred to a nonendangered species that acts as a surrogate mother. This clip ends with the birth of Jazz, an African wild cat.

Video Clip 4 – Successful reintroduction of zoo species into the wild is also a goal of zoos. Seaworld San Diego has an animal rescue program that has saved many marine mammals. Animal care specialists prepare the animal for reintroduction by helping it improve its feeding and communication skills. Other programs such as the Bronx Zoo’s worldwide field projects focus on preserving and restoring natural habitats. Many zoos have exhibits that feature animals native to the area where the zoo is located. This educates the public about native species and their value.

Video Clip 5 – In the last clip Greg talks with young people who participate in a Junior Zoo Keeper program. The benefits they discuss include learning about animals and the environment and career possibilities. The also stress the importance of increasing awareness of habitat destruction. Also important is that they have learned that people can change things for the better.

CULMINATING ACTIVITIES:

1. Assign student groups the activity of selecting a threatened or endangered species and researching reasons why its population numbers are decreasing. The species described on the World Wildlife Fund web site are pandas, gorillas, rhinos, whales, elephants, and tigers. Assign students the Web site of your related state agency, such as Wildlife and Fisheries, if you want them to include native species. Students should locate information and pictures of the animal’s habitat. They should also research animal behavior such as hunting, foraging, mating, avoiding predators, and other interactions with members of their species and other animals.
2. Assign the problem of designing a zoo exhibit for their endangered animal that has a naturalistic environment and incorporates environmental enrichment. The exhibit should also allow zoo visitors to view the animals. The goal of this exhibit is to increase a healthy zoo population of the endangered species for future generations and possible reintroduction into the wild. If you want to spend more time, have the students actually build a model of the exhibit.
3. Ask each group to present its design to the class.
4. Have each group evaluate its design.

CROSS-CURRICULAR EXTENSIONS:

ART:

- Groups create designs and/or models.

ENGLISH/LANGUAGE ARTS:

- Groups show their finished products to the class in an oral presentation.

COMMUNITY CONNECTIONS:

- Invite a zookeeper to evaluate the designs and provide feedback to the students.
- Some zoos have traveling trunks containing illegal items from endangered species that have been confiscated by customs officials. Check out the trunk and have students discuss reasons for species declining in numbers.

STUDENT MATERIALS:

- **A Zoo View Student Viewing Guide**

NAME _____ CLASS _____ DATE _____

**A ZOO VIEW
STUDENT VIEWING GUIDE**

Clip 1:

1. Describe the negative effects some zoos, like Zoo Atlanta, had on animals before its changes.

2. Describe changes that have been made at most North American zoos today and the effects of these changes on zoo animals.

3. Define naturalistic landscape.

Clip 2:

4. What types of experts are involved in designing and building zoos?

5. What purposes do plants serve in a zoo exhibit?

6. What different species of animals are often found living together in the same exhibit?

7. Define environmental enrichment and give examples of how it stimulates zoo animals.



Clip 3:

8. What is a species survival plan?

9. Describe how genetic information from endangered species is stored for future generations.

Clip 4:

10. What are some of the reasons why reintroduction of zoo animals or injured animals to the wild is difficult?

11. How does Seaworld's animal rescue program overcome some of these problems?

12. What are field projects?

Clip 5:

13. Describe some of the benefits of Junior Zoo Keeper Programs.

**A ZOO VIEW
STUDENT VIEWING GUIDE
ANSWER KEY**

1. stereotyped, ritualistic behavior problems, disease, poor health
2. naturalistic landscapes, cohabitation, larger spaces, less of an enclosure, still seems close to zoo visitor
animals do not exhibit stereotyped, ritualistic behavior, more play, more natural behavior such as climbing trees
3. an environment that closely resembles the natural habitat but is not a duplicate of it
4. horticulturists, animal care workers (zookeepers, zoologists, biologists)
5. simulate natural habitat, provide cover for hiding, sometimes serve as food, climbing areas and others
6. to simulate the natural habitat
7. providing opportunities for animals to perform natural activities; examples – hiding food, providing objects with which to play
8. plan to improve reproduction rates and provide healthy populations of zoo animal species, possibly with reintroduction into the wild
9. genetic information in the form of DNA, sperm, or embryos is frozen using liquid nitrogen and stored frozen
10. animals kept in zoos have no predators, few parasites, and plentiful food
11. trainers recondition the animals to the wild; practice food getting and communication
12. projects to preserve and build native habitats and educate local people about endangered species
13. education about endangered species, career information, a chance to help out

