



A PLAN FOR SURVIVAL

Grades 7 - 12

Teacher Packet

CONTENTS:

1. Resources

- Pennsylvania Academic Standards
- Background Information
- Vocabulary
- Suggested Reading List
- Internet Resources

2. Pre-Visit Activity

- Which Habitat Would You Save First?

3. In-Zoo Activity

- Zoo Challenge

4. Post-Visit Activity

- Endangered Species Debate



PENNSYLVANIA ACADEMIC STANDARDS

Academic Standards for Environment and Ecology

4.7. THREATENED, ENDANGERED AND EXTINCT SPECIES

- 4. 7. 10 A Explain the significance of diversity in ecosystems.
- 4. 7. 12 B Examine the effects of extinctions, both natural and human caused, on the environment.
- 4. 7. 12 C Analyze the effects of threatened, endangered or extinct species on human and natural systems.

4.9. ENVIRONMENTAL LAWS AND REGULATIONS

- 4. 9. 10 A Explain why environmental laws and regulations are developed and enacted.
- 4. 9. 12 A Analyze environmental laws and regulations as they relate to environmental issues.



BACKGROUND INFORMATION

Today the Earth is losing more species of animals than in the entire existence of the planet. Throughout the ages, many animal and plant species have come and gone, subject to natural extinction as geologic and climatic changes have occurred. Some scientists estimate that the current rate of extinction is at least one animal species every day because of human activities, and the rate of species loss is increasing. In an effort to ensure the survival of many of the world's most endangered wildlife species, the Association of Zoos and Aquariums (AZA) has created a program called the Species Survival Plan.

THE SPECIES SURVIVAL PLAN

The Species Survival Plan, or SSP, began in 1981 as a cooperative population management and conservation program for selected species at North American zoos and aquariums. Each SSP carefully manages the breeding of a species in order to maintain a healthy and self-sustaining captive population that is both genetically diverse and demographically stable. The American Zoo and Aquarium Association, whose membership includes over 200 accredited zoos and aquariums throughout North America, currently administers over 100 SSPs covering more than 150 individual species

HOW IT WORKS

Each SSP has a qualified species coordinator who is responsible for managing its day-to-day activities. Management committees composed of various experts assist the coordinator with the conservation efforts for the particular species, including aspects of population management, research, education and reintroduction when feasible. Each institution holding an SSP animal has a representative whom attends the relevant SSP meetings and coordinates the SSP activities at their institution.

THE SSP MASTER PLAN

An SSP Master Plan outlines the goals for the population. It designs the "family tree" of a particular captive population in order to achieve maximum genetic diversity and demographic stability. Breeding and other management recommendations are made for each animal with consideration given to the logistics and feasibility of transfers between institutions, as well as maintenance of natural social groupings.

THE STUDBOOK

Studbooks are fundamental to the successful operation of SSPs, as each contains the vital records of an entire captive population of species, including births, deaths, transfers and lineage. With appropriate computer analysis, a studbook enables the species coordinator and management group to develop a Master Plan that contains sound breeding recommendations based on genetics, demographics and the species' biology. Data for each studbook is compiled and constantly updated by a "Studbook Keeper" who has knowledge of the species and time to assist in its conservation.



THE HUSBANDRY MANUAL

Many SSPs have developed husbandry manuals, which set guidelines based on the best current scientific knowledge for the diet and care of the species in captivity. With standardized husbandry practices, it is easier to detect husbandry problems. In addition, because the guidelines provide consistency among participating institutions, it is also easier to transfer animals between them when necessary.

THE HUMAN COMPONENT TO SPECIES LOSS

Zoos and aquariums cannot do it all. It is up to humans to curb their harmful intervention into the animal world in order to make a difference. The problems affecting our wild animal populations are often referred to as the HIPPO dilemma. Each letter represents a reason for animal endangerment.

H - Habitat loss - This is the number one problem facing animals worldwide. As the wild spaces continue to shrink, there is less and less room for the creatures that call them home. Here in the United States, we have lost over half of our original wetlands and prairies due not only to large-scale construction, but also to the division of these habitats by roads, even narrow ones.

I - Introduction of Exotic Species - Species of animals and plants are brought into new areas for many reasons, sometimes intentionally, sometimes accidentally. When they are, many times they wreak havoc on the existing ecosystem. Each ecosystem is carefully balanced so that no one species of animal or plant overpopulates. There are checks and balances within them, including predator/prey ratios, competition for resources, species-specific disease or parasites, etc.

P - Pollution - Pollution affects the air, soil and water. These pollutants can cause problems for all life on the planet. Fortunately, pollution is one problem that we can impact in big ways in a relatively short period of time. By becoming more energy efficient, reducing the amount of waste produced, developing “greener” technologies, and switching to less harmful products we can make an impact on this problem.

P - Population - The population of the planet has now topped 6 billion, and is still growing. About 90 million people are added to the planet every year. Supporting such a large number of people greatly taxes the natural resources of the planet. The growing population is a direct cause of habitat loss

O - Overconsumption - All living things need to use the resources of their environment to survive. When more is taken than is needed, it is overconsumption. Demands on some resources are greater than the rate at which they can be replenished. All of these problems have a devastating impact on the biodiversity of the planet.

These problems are not isolated or new. They are widespread and require immediate attention.



SOLUTIONS

The problems faced by the wildlife of our planet may seem insurmountable, but progress is being made. In 1973, congress passed the Endangered Species Act. This law protects at-risk species from illegal hunting, the total loss of their habitat, and provided hope for their continued survival. Presently, more than 356 species of animals and plants listed as endangered in the United States and 517 species in foreign countries are protected under the law. Better yet, 31 species, including the American alligator and the bald eagle have made such significant comebacks that the U.S. Fish and Wildlife Service no longer list them as endangered.



VOCABULARY

Adaptation - behavioral or physical change that improves a plant or animals chance for survival in its habitat.

Behavior - actions or reactions of animals under specified circumstances.

Conservation - the wise use of natural resources in order to insure continued availability to future generations.

Biodiversity - The variety of life on our planet.

Endangered - a species at risk of becoming extinct unless conservation measures enable the populations to increase.

Endemic species - a species restricted or peculiar to a locality or region.

Extinct - the complete loss of a species.

Flagship species - a globally recognized species that engenders conservation efforts.

Habitat - the place where an animal lives.

Habitat loss - the depletion of natural settings due to human activity or natural disasters.

Lineage - a descent in a line from a common ancestor in the direct line.

Keystone species - a species who holds a critical position in its biome, without this species the biome would cease to function properly.

New World - The western hemisphere.

Old World - The eastern Hemisphere.

Reintroduction - the release of an animal or plant species into its natural habitat.

Species Survival Plan (SSP) - a cooperative population management and conservation program for selected wildlife species.

Studbook -an official document that contains records of a captive population of species

Taxon advisory group (TAG) - an animal conservation program that examines the conservation needs of an entire group of related species.

Threatened - an organism whose population is declining in numbers but has not yet become endangered.

Umbrella species - a species so interdependent within its biome that when it is protected, all other species within that biome are also protected.



SUGGESTED READING LIST

Teacher Resources

Ecology, Usborne Science & Experiments by Richard Spurgeon

Mountain Animals in Danger by Gary Turbak

Species Survival Plans: Strategies for Wildlife Conservation by Robert J. Wiese and Michael Hutchins

The Rainforest by D'Arcy Richardson

Who's Endangered on Noah's Ark - Literary and Science Activities for Teachers and Parents by Glenn McGathery and Norma J. Livo

Student Resources

Animals in Jeopardy edited by Young Discovery Library

Back to the Wild by Dorothy Hinshaw Patent

Children Save the Rainforest by Dorothy Hinshaw Patent

Go and Come Back by Joan Abelow.

Life in The Amazon Rainforest: (The Way People Live) by Stuart A. Kallen

One Day in the Tropical Rain Forest by Jean Craighead George.

One River: Explorations And Discoveries in the Amazon Rain Forest by Wae Davis.

Ranger Rick's Nature Scope: Endangered Species: Wild & Rare edited by Judy Braus

Ranger Rick's Nature Scope: Problems and Solutions edited by Judy Braus

Running The Amazon by Joe Kane.

INTERNET RESOURCES

African animal information and live pictures: www.africam.com

All About Nature: Animal Printouts: www.enchantedlearning.com/colorin

Animals of the Rainforest: www.animalsoftherainforest.org

American Zoo & Aquarium Association: www.aza.org

Department of Environmental Protection: www.dep.state.pa.us/educators/default.htm

Electronic Zoo: www.avma.org

Forest Conservation Portal: www.forests.org

International Society for the Preservation of Rainforests: www.isptr-pard.org

National Wildlife Federation: www.nwf.org

National Wildlife Service: www.endangered.fws.gov

Pittsburgh Zoo & PPG Aquarium: www.pittsburghzoo.com

Project Tamarin: www.csew.com/cottontop/SSP/Enghome.htm

Rainforest Alliance: www.rainforest-alliance.org/

Rainforest Action Network: www.ran.org

The Wild Ones Animal Index: www.thewildones.org

World Wildlife Fund: www.wwf.org



WHICH HABITAT WOULD YOU SAVE FIRST?

Pre-visit Lesson Grades 7 - 12

OBJECTIVES:

- TSW research the characteristics of individual habitats.
- TSW design an advertisement for a habitat.
- TSW decide which of our planet's habitats are the most important.

MATERIALS:

- * Chalkboard, dry-erase board, or overhead projector
- * Paper
- * Pencils, pens, or markers

PROCEDURES:

ANTICIPATORY SET:

Have the students name as many habitats (rainforest, wetlands, desert, prairie, temperate forest, savanna, etc...) as they can think of, and write them on the board. Ask the students to rank, on paper, the habitats by their importance to the environment, and place the paper aside.

DEVELOPMENT OF LESSON:

1. Divide the class into groups of 4 students.
2. Have each group research one of the habitats on the board, and discover the following information about their habitat:
 - * Climate
 - * Geographic Location
 - * Species (Plants & Animals)
 - * Endangered species
 - * Threatened species
 - * Endemic Species
 - * Keystone species
 - * Economic uses (food, medications, etc...)
3. The students should use the information they have collected to design an advertisement for their habitat.
4. Each group should have one representative read their ad for the rest of the class.
5. Have the class use the information in the ads to decide which of the habitats should be the first to be saved, second? third?... last?
6. Ask the class why they chose the rank of each habitat, and if it was a difficult decision to make.

SUMMARY:

Ask the students if their opinions have changed since the beginning of class, and remind them of the importance of making informed decisions.



ZOO CHALLENGE

In-Zoo Activity

OBJECTIVES:

CHALLENGE I:

- TSW identify endangered animals at the zoo.
- TSW record observations about an endangered animal.
- TSW develop “I wonder” questions about the observed animal.

CHALLENGE II:

- TSW identify endangered animals at the zoo.
- TSW utilize information available at an animal’s exhibit to write a commercial jingle about that animal.

MATERIALS:

- Teacher vocabulary list
- Zoo Challenge handout
- Paper and pencils

PROCEDURES:

ANTICIPATORY SET:

Review the vocabulary list with the students. Split the class into groups of 3-4 students per group (the zoo requires a one to ten ratio of chaperones to students). Distribute a copy of the Zoo Challenge handout to each group.

DEVELOPMENT OF LESSON:

The students can decide which Zoo Challenge they will focus on. The teacher has the option of having the students complete both of the challenges or assigning a different challenge to each group. You may want to assign a time limit to keep the groups focused on their task.

SUMMARY:

Have each group present their completed materials during a class period. Each group can exhibit their materials with background information on the Zoo Challenge they chose for their focus.



ZOO CHALLENGE

DIRECTIONS:

Your team must work together, making sure you budget your time. Make sure you read the challenge you are focusing on and provide the best information; be creative and thorough.

Challenge I

Fact: The staff at the Pittsburgh Zoo & PPG Aquarium is dedicated to conserving endangered species from around the world. The zoo is home to more than 18 different species of endangered animals and is dedicated to protecting and preserving the Earth's animal species and their precious habitats.

Fun: Find an endangered animal that best represents your group, and give your group a name. Sketch a picture of the animal that will become the cover of the journal that you will create. Take turns recording what the group notices about your animal. Record "I wonder" questions about the animal. If you need further evidence for your animal's behavior, then you can sketch a picture beside your question.

Examples:

I wonder if my animal is hungry.

I wonder what my animal is thinking right now.

I wonder if my animal is tired.

Brainstorm and record possible ways that you could test the answers.

Challenge II

Fact: Educating visitors on natural resource conservation is a very important mission of the Zoo. Some of the methods used to display conservation messages include signage, exhibit narration, tour programs, shows, and up-close animal experiences.

Fun: Pick an endangered animal. Write a brief commercial jingle about the conservation of that animal. It is okay to include facts about its size, lifestyle, behaviors, and adaptations (use the information found on that animal's graphics). Now set your jingle to the rhythm of a popular song.



ENDANGERED SPECIES ACT: TO BE OR NOT TO BE?

Endangered Species Debate

Three Class Periods

OBJECTIVES:

- TSW define the terms endangered and threatened.
- TSW understand the impact of the Endangered Species Act (ESA).
- TSW debate the re-enactment of the Endangered Species Act (ESA).

MATERIALS:

- Stuffed animals (one per student)
- Blankets (minimum 3)
- Rules for Debate
- Timer
- “Who Would You Save First?”

PROCEDURES:

ANTICIPATORY SET: ANIMAL TOSS/BLANKET ACTIVITY*

1. Lay out the blankets on the floor and distribute the stuffed animals to each of the students. Explain that the students are trees in the forest and the blankets are the forest floor and that they provide the homes for the animals that they are holding. Have the students stand on the blankets.
2. Ask the students to name a reason that animals are becoming endangered (HIPPO Dilemma: H - Habitat Loss, I - Introduction of exotic species, P - pollution, P - population of people increasing, and O - over consumption). As the students give a reason, take away some of the “trees”. As the “trees” are taken away, have the “trees” toss their animal into the air and the remaining trees are to catch the animals. Once a tree has been taken away, it is to leave the forest (have the students move off the blankets). When there are only a couple of “trees” left on the blanket, remove the blanket to show that this is an acre of forest that is no longer available to the animals.
3. Continue to have students name the reasons until there is only one blanket left.
4. Now, ask all of the students to name a way to help save the animals. As they name some reasons, bring back some forest (blanket) and then some trees (students).

* This activity can be done without the stuffed animals.



DEVELOPMENT OF LESSON:

1. Period One:

- Review the terms endangered and threatened.
- Explain that the class will debate the re-enactment of the Endangered Species Act (ESA).
- Divide the class into two groups. One group is to do research on why the ESA should not be re-enacted and the second group is to research why the ESA should be re-enacted.
- Inform the students that they will need to keep an accurate bibliography which must include the following:
 - One encyclopedia or book
 - One environmental organization
 - One internet site
- Distribute and review the rules for debate

2. Period Two:

- Have the students research their position and formulate their position statements. Use the following questions to guide the students in their research (try to allow the students to think of these questions first):
 - How many U.S. endangered species are listed?
 - Have any animals been removed from the list?
 - When was the Endangered Species Act first enacted?
 - When did it come up for renewal?
 - Does the cost of saving endangered species justify a continuation of the practice?
 - Does the Endangered Species Act work?
- Have each group pick 2 spokespeople

3. Period Three:

- Arrange the classroom to facilitate the debates.
- Each team is to be given three minutes to state their position after which the opposing team is given one minute of rebuttal time.
- Once the debate is finished, the teacher is to summarize all points addressed during the debate and have the class act as a legislating body and vote on the re-enactment of the Endangered Species Act.

SUMMARY:

Discuss with the students the importance of communication and public awareness of environmental issues. Encourage the students to continue to research on their own.



RULES FOR DEBATE

- State your position at the beginning and end of your presentation, and several times in the middle.
- Anticipate your opponent's arguments beforehand and point out the weaknesses.
- Use visual aids (blackboard, handouts, overhead projector etc.) to support your position.
- Conclude your argument by summarizing your major points.
- Leave personal views and experiences out of the presentation. Concentrate on arguments and think through your position. Present only the facts.
- Speak loudly and clearly, and address your remarks to the audience.
- Speak confidently; always sound as if you believe absolutely in what you are saying.
- Use notes; always prepare more notes than you think you will need. If you feel that you are running out of time, skip some of your notes and jump to the conclusion.
- Never agree with the other side or suggest compromise positions.
- If a team is proposing a plan of action, they must show supporting evidence or proof that the plan is needed. Facts presented in this manner must be accurate.
- No new arguments may be introduced during rebuttal of the opposing position.