



Vet Bags

at the Sarah Allison Steffee Center
for Zoological Medicine

Self-guided Exploration Grade level: Fourth-Sixth Grade

Before Your Visit

To prepare for your field trip, please take advantage of the following Zoo resources:

Cleveland Metroparks Zoo's website, clemet zoo.com

Discover: Animals and Plants

Check our *Animal News* for the latest updates on recent animal births and new animals to the Zoo's collection. *Animal Facts* is a wonderful resource for students doing research on particular animal species.

Learn: Education

A variety of student activities can be found under *Students*. Included here are *Animal Fun & Games*, a variety of twelve educational games for students of all ages. Try "Veterinary Vocabulary: Do You Speak Zoo?" to get your students ready for their visit to the Sarah Allison Steffee Center for Zoological Medicine and "You Belong in a Zoo" to meet the Zoo's veterinarians. Use the *Walking Map with Distances* to see what else you may be able to fit into your Zoo visit.

Explore: Plan Your Visit

At 168 acres, you can't see it all in one day, so use the *Zoo Map and Virtual Tour* to plan which exhibits you would like your students to see.

At the Zoo

The Vet Bags Self-Guided Exploration takes place at the Sarah Allison Steffee Center for Zoological Medicine. The following Exhibit Overview will help orient you and your students to the space:

Exhibit Overview

The Sarah Allison Steffee Center for Zoological Medicine provides world-class care for the Zoo's 3,000 animals. Since it's opening on September 30, 2004, the Center supports groundbreaking research and engages Zoo visitors in veterinary care issues. The 24,000 square foot structure is divided into four areas: hospital, quarantine, conservation and science, and an education pavilion.

The hospital wing, dedicated to diagnosis, treatment and surgical procedures has separate treatment areas for small and large animals, a radiology lab, clinical labs, and a pharmacy. New technological

infrastructure enables the veterinary care staff to use the latest diagnostic tools, including the first CT scanner in any zoo.

A substantial portion of the center is devoted to quarantine areas. All new animals that enter the Zoo must be quarantined for a minimum of 30 days and undergo medical evaluations to insure that they are healthy and won't introduce disease to the animals already in residence at the Zoo. Isolation stalls specifically designed for hoofed animals, large animals, small animals, and primates help Zoo curators efficiently and safely facilitate animal transfers.

The conservation and science wing of the building houses offices and shared facilities for close collaboration between veterinary and research staff. Behavioral, reproductive, and endocrinology research takes place in a new laboratory. Graduate students conduct on-site research or becoming involved with local and international field programs. Support facilities include a computer lab, clinical laboratories, and a library.

The Center for Zoological Medicine offers unprecedented public access in an adjoining education pavilion - the Reinberger Learning Lab. Here, Zoo visitors can learn about veterinary care at all stages of an animal's life, from delivery to departure. The displays feature hands-on interactives, tools-of-the-trade, and views to surgical suites where visitors might sneak a peak at a treatment procedure in progress.

The Center for Zoological Medicine sustains Cleveland Metroparks Zoo's commitment to conservation and reinforces the Zoo's role as a leading institution in scientific animal management.

During the activity, which is anticipated to take under an hour to complete, you can expect the following goals and objectives to be covered:

Vet Bag Self-Guided Exploration

Introduction: This role-playing activity is designed to challenge students to work together and think in a scientific manner. They will make observations, work with and manipulate data, change their ideas as new knowledge is gained and draw their own conclusions in an effort to solve a scientific problem – a polar bear with a medical problem. All of these steps are key skills in the critical thinking process.

Goals: Students will participate in the scientific inquiry process, requiring them to learn, reason, think creatively, and make decisions to solve a problem.

Objectives: While playing a role as a member of a veterinary medicine team, students will: 1) gather data about a polar bear with a medical problem, 2) develop a diagnosis (hypothesis) as to the nature of the problem, 3) re-evaluate their hypothesis when presented with new data, and 4) plan an appropriate course of treatment to solve the problem.

IMPORTANT: This is a self-guided exploration for you and your students. The goal is for you to guide your students through a critical thinking process and for them to develop reasonable explanations to the data they gather. There are no definitive right and wrong answers in this process. While there may be staff and volunteers in this exhibit during your exploration, they will not be able to devote all of their time assisting your students with their project. Please assure your students that science is a way of thinking and finding wrong conclusions is just as important as finding conclusions that prove to be true.

Depending upon the thought processes that your students go through in order to develop a diagnosis to the polar bear's problem, the activity will touch upon the following Ohio Academic Content Standards to varying degrees:

Ohio Academic Content Standards for Science Correlations

Grade 4

Science and Technology

3. Describe, illustrate and evaluate the design process used to solve a problem.

Scientific Inquiry

2. Analyze a series of events and/or simple daily or seasonal cycles, describe the patterns and infer the next likely occurrence.
3. Develop, design and conduct safe, simple investigations or experiments to answer questions.

Scientific Ways of Knowing

4. Explain why keeping records of observations and investigations is important.

Grade 5

Scientific Inquiry

2. Evaluate observations and measurements made by other people and identify reasons for any discrepancies.
3. Use evidence and observations to explain and communicate the results of investigations.
4. Identify potential hazards and/or precautions involved in an investigation.

Scientific Ways of Knowing

1. Summarize how conclusions and ideas change as new knowledge is gained.
4. Identify how scientists use different kinds of ongoing investigations depending on the questions they are trying to answer (e.g., observations of things or events in nature, data collection and controlled experiments).
5. Keep records of investigations and observations that are understandable weeks or months later.
6. Identify a variety of scientific and technological work that people of all ages, backgrounds and groups perform.

Grade 6

Science and Technology

1. Explain how technology influences the quality of life.
5. Design and build a product or create a solution to a problem given one constraint (e.g., limits of cost and time for design and production, supply of materials and environmental effects).

Scientific Ways of Knowing

1. Identify that hypotheses are valuable even when they are not supported.
2. Describe why it is important to keep clear, thorough and accurate records
3. Identify ways scientific thinking is helpful in a variety of everyday settings.

Back at School

The following lessons are designed for use in the school classroom, either before or after your trip to the Zoo. When used in conjunction with the Vet Bag Self-Guided Exploration, your students will enjoy a comprehensive lesson on the variety of zoo careers and the science, math and other skills and abilities necessary to work effectively in the career field. At the same time, students will develop skills necessary for critical thinking, analysis, observation, inquiry and scientific investigation.

DIY: Zoo Exhibit Design

Introduction: It takes many different people with many different backgrounds to design a zoo exhibit. While the health and welfare of the animals within the exhibit are the top priority, exhibit designers also need to consider the needs of animal management staff and of the zoo visitor. DIY: Zoo Exhibit Design will expose students to the complexities of modern zoo exhibit design.

Goal: Students will appreciate the complexity of designing modern zoo exhibits to meet the needs of the animals living in them, the staff who manages the animal's care and the patrons who visit the facility.

Objectives: Students will: 1) research basic life history facts of an animal,
2) design a zoo exhibit for that animal,
3) review that design from the perspective of three different stakeholders,
4) and describe and illustrate the design process.

Ohio Academic Content Standards for Science Correlations

Grade 4

Life Sciences

5. Describe how organisms interact with one another in various ways (e.g., many plants depend on animals for carrying pollen or dispersing seeds).

Science and Technology

3. Describe, illustrate and evaluate the design process used to solve a problem.

Grade 5

Life Sciences

4. Summarize that organisms can survive only in ecosystems in which their needs can be met (e.g., food, water, shelter, air, carrying capacity and waste disposal). The world has different ecosystems and distinct ecosystems support the lives of different types of organisms.

5. Support how an organism's patterns of behavior are related to the nature of that organism's ecosystem, including the kinds and numbers of other organisms present, the availability of food and resources, and the changing physical characteristics of the ecosystem.

Science and Technology

3. Explain how the solution to one problem may create other problems.

Scientific Ways of Knowing

6. Identify a variety of scientific and technological work that people of all ages, backgrounds and groups perform.

Grade 6

Life Sciences

8. Describe how organisms may interact with one another.

Science and Technology

5. Design and build a product or create a solution to a problem given one constraint (e.g., limits of cost and time for design and production, supply of materials and environmental effects).

Scientific Ways of Knowing

4. Describe how the pursuit of scientific knowledge is beneficial to any career and for daily life.

Materials: *A Brief History of Zoos* resource sheet, *Exhibit Design Considerations* resource sheet, animal fact sheets, poster board/easel paper, pens/pencils, markers, various art supplies

Procedure:

1. The instructor will work with the students as a large group to brainstorm their responses to the following question, "What things make a zoo exhibit great?"
2. The instructor will provide each student with *A Brief History of Zoos*. After they have had time to read it, revisit the brainstorm session and add to their list.
3. Students will be broken down into groups of 4-5. Each student group will be designing a zoo exhibit for an animal of their choice. (Option: If time is limited, the instructor can assign

specific animals to each group. Animal info sheets from clemetzoo.com will cut down on student research time.)

4. The instructor will provide each student group with a copy of *Exhibit Design Considerations*. This list is designed to enhance, not replace, the list generated by the students brainstorming session.
5. Each student group will take on the role of exhibit designers, working collaboratively to design a suitable zoo habitat for their animal. The exhibit design groups should consult the student-generated brainstorm list and *Exhibit Design Considerations* to make sure their design meets the needs of the animal, animal management staff and zoo visitors. (Option: If time is limited, the instructor should ask the students to limit their design to meeting three animal needs, three animal management staff needs and three zoo visitor needs. If students try to tackle everything, this project could take more time than is available.)
6. Provide each exhibit design group with poster board or easel paper, pens/pencils, markers and various art supplies for creating their designs. The instructor should inform the groups that they will present their finished designs to the class, explaining why the exhibit is designed the way that it is and what needs of the animal, animal management staff and zoo visitor are met. (Option: The instructor may wish to have the students create three-dimensional designs of their exhibits if time allows. Additional art materials not included in the lesson materials will also be needed.)
7. Following the exhibit design presentations, the instructor should work with the students to determine what some of the biggest challenges the students had to overcome in order to create their exhibit designs. The challenges faced by the students are just a taste of what zoo staff face every time they design a new exhibit. With the help of professional exhibit designers, zoo staff spent nearly 5 years in the design of African Elephant Crossing, which is expected to open at Cleveland Metroparks Zoo in 2010.

Evaluation

- ◆ Participation in the group discussions
- ◆ Participation in the small group
- ◆ Group presentation

ZooTycoon

Introduction: The commercially available video game Zoo Tycoon can be another valuable tool for bringing zoo career, exhibit design, facility management and economic concepts into your classroom. Zoo Tycoon, rated E for everyone, has received numerous awards including the 2004 Scholastic Parent & Child Teacher's Pick. The Zookeeper Selection of the game includes Zoo Tycoon 2 as well as the Endangered Species and African Adventure expansion packs. Information and free game trial downloads are available at zootycoon.com.

A Brief History of Zoos

Around 3,500 years ago, Egyptian Queen Hatshepsut collected exotic animals as a symbol of her wealth and power. These animal menageries, or collections of wild animals kept in cages, were common through the early 19th century. Menageries were not built with the animals in mind. Rather, they were designed to give visitors a good, close look. The first zoological garden in Regent's Park, London, opened in 1828. During the 1800's, the popularity of zoos grew quickly. The first zoological gardens in the United States opened in Philadelphia in 1874. These early zoos were designed to provide an entertaining experience for the visitor while being easy for the animal keepers to maintain the facilities

Cleveland Metroparks Zoo opened in 1882 and moved to its current location in 1907.

By the 1900's, the health of zoo animals became more important for their keepers, not for the animal's welfare, but because getting animals from the wild was becoming increasingly more difficult. It was becoming obvious that to remain healthy and breeding, zoo animals needed surroundings that were more like their natural environments. A German named Carl Hagenbeck began to build his own zoo in 1890. He wrote, "I wished to exhibit them not as captives, confined to narrow spaces and looked at between bars, but as free to wander from place to place within as large limits as possible and with no bars to obstruct the view and serve as a reminder of captivity." This new zoo changed the public idea of how animals should be kept. This trend continues to grow today. Zoo exhibits now attempt to recreate the natural habitats in which the animals live. This change has occurred because preserving wildlife and education has become the main role of zoos.

Cleveland Metroparks Zoo is continually making improvements to its exhibits and facilities.

The next major undertaking for Cleveland Metroparks Zoo is African Elephant Crossing, which will quadruple the amount of Zoo space dedicated to elephants and provide them with stimulating surroundings similar to their native savanna. Spread over five acres of lightly wooded grasslands, the new exhibit will feature two large yards, pools, a cascading waterfall, seven indoor stalls and a heated outdoor range. Other species including meerkats, naked mole rats, African rock pythons and spectacular birds will have homes in African Elephant Crossing, as well. Exceptional viewing areas will offer visitors an up-close peek into the world of African elephants, and an education village will teach people about elephants and threats to their survival, including habitat loss, poaching and illegal ivory trading.

African Elephant Crossing is expected to open at Cleveland Metroparks Zoo in 2010.

Exhibit Design Considerations

Animal Behavior and Health

- Does the animal live alone or in groups? How many should live in the exhibit?
- What size should the exhibit be?
- Does the animal have shelter from the weather?
- What will the animals be fed?
- Should there be plants in the exhibit? What type?
- Would it be a good idea to put other kinds of animals in the exhibit with your animal? Why or why not?
- What does your animal need water for? How will you provide it?
- Does the exhibit have different microhabitats that allow the animal to choose the temperature at which it is most comfortable (i.e., cool spots for when it's too hot/warm spots for when it's too cold)?
- What is the main substrate on the exhibit floor? Does this provide for a need of the animal?
- What types of enrichment (playthings, food items presented in a creative way, training, etc.) will be used in the exhibit to keep your animal mentally stimulated?
- Does the animal have a place to go for privacy?

Animal Management Staff Needs

- What types of barriers will you use to keep the animals in and the people out?
- Where would the keepers enter the exhibit to feed the animals? Do you want visitors to see the keeper and/or the food?
- What is the main substrate on the exhibit floor? Is the keeper able to keep this area clean?
- Can the keeper separate animals if need be (to prevent breeding, to allow new mothers private time with their newborns, etc.)?
- Is the keeper safe at all times (while feeding, while cleaning, while training, etc.)?

Visitor Needs

- How would you make sure the animals are visible to the public?
- Is your viewing area accessible to everyone, including people in wheelchairs and small children both in and out of strollers?
- What important facts about the animal should visitors learn from viewing your exhibit?
- What important facts about the habitat should visitors learn from viewing your exhibit?
- Would the zoo graphics be words only or would you use drawings, photographs, etc?

Types of Jobs in Zoos and Aquariums

With more than a hundred million people visiting AZA (Association of Zoos and Aquariums) institutions annually, all zoo and aquarium employees have the opportunity to educate the public about the critical need for the conservation of wildlife and wild lands. This responsibility assures an interesting and rewarding career, but the profession requires more than a commitment to conservation – it requires hard work.

Zoo and aquarium employment is not always glamorous. Much of the work requires physical strength, as well as the ability to make detailed observations and keep information up-to-date. It takes a special kind of dedication to provide care to captive animals that require attention 24 hours a day, seven days a week, come snow, rain, or shine.

Requirements

The conservation and scientific programs in zoos and aquariums have become highly technical and specialized. Although practical experience with animals may sometimes be substituted for academic training, most entry-level keeper positions now require a four-year college degree. Training in animal science, zoology, marine biology, conservation biology, wildlife management, and animal behavior is preferred. Curatorial, research, and conservation positions typically require advanced academic degrees.

Student wishing to pursue animal-related careers are encouraged to carefully review the curriculum of the schools they wish to attend, as some programs focus more on a zoological application than others. Students who are interested in the business side of zoo and aquarium operations should concentrate on skills related to a particular area of expertise, such as accounting, public relations, marketing, personnel management, etc. Whatever your career goal, guidance counselors can offer assistance in determining the most appropriate course of study.

Salaries

Salaries for zoo and aquarium employees vary depending on the institution and its location. Institutions located in metropolitan areas generally offer higher salaries. An animal keeper's salary can range from minimum wage to more than \$30,000 a year, depending on skills and tenure. Salaries for other employees usually compare favorably with those prevailing in that region.

Positions

Listed below are some positions in zoos and aquariums and a brief description of duties. Not all positions are found in all facilities, and responsibilities often vary:

Director/Chief Operating Officer

Executes policies as directed by the governing authority. Responsible for the institution's operation and plans for future development.

Assistant Director

Assists the director and assumes charge in the director's absence.

Finance Manager/Director

Manages the institution's finances, including payment of bills, purchasing, investments, and the preparation of financial statements.

General Curator

Oversees an institution's entire animal collection and animal management staff. Responsible for strategic collection planning.

Animal Curator

Manages a certain portion of an institution's animal collection; i.e., mammals, birds, fish, reptiles, etc.

Veterinarian

Responsible for the healthcare program for the animal collection and the maintenance of health records.

Veterinary Technician

Assists the veterinarian and provides care to the animals under the supervision of the veterinarian.

Registrar

Maintains computer records on the animal collection and applies for permits and licenses to hold or transport animals.

Curator/Coordinator/Director of Research

Supervises research projects, serves as liaison between the institution and the academic community, and publishes articles in scientific journals.

Curator/Coordinator/Director of Conservation

Oversees the institution's conservation activities, including field projects. Serves as liaison with government wildlife agencies and other conservation projects.

Conservation Biologist/Zoologist

Provides scientific and technical assistance in the management of the animal collection and assists in conducting various research or field conservation projects.

Head Keeper/Aquarist

Supervises a section or department of the institution; provides training and scheduling for keepers.

Senior Keeper/Aquarist

Provides primary animal care for a department.

Keeper/Aquarist

Provides daily care to the institution's animals, including diet preparation, cleaning, general exhibit maintenance, and record keeping.

Operations Director/Manager

Responsible for the daily operation of the institution's physical plant and equipment.

Curator of Exhibits

Creates exhibits and assists in the design of graphics.

Curator of Horticulture

Responsible for the botanical collection and its application to the animal collection, as well as daily maintenance of the institution's grounds.

Curator of Education

Plans and implements the institution's education programs.

Public Relations/Affairs Manager/Director

Promotes the institution, its mission, and its programs to the public via the media.

Development Director/Officer

Develops and manages fund-raising activities which can include writing grant proposals and attracting corporate sponsors, as well as soliciting private donations.

Marketing Director/Manager

Creates advertising campaigns and other activities to increase public awareness of the institution.

Special Events Manager/Coordinator

Develops and implements events to attract visitors throughout the year.

Membership Director/Manager

Responsible for maintaining and increasing institution memberships for families and individuals and designing special events for members only. May also be in charge of "adopt-an-animal" programs to raise funds.

Gift Shop Manager

Manages staff and all aspects of gift shop operation from buying products to designing shops.

Visitor Services Manager

Supervises the staff and facilities that cater to the visiting public including concessions and restrooms.

Personnel Manager/Director

Responsible for all personnel matters including payroll, insurance, and tax matters.

Volunteer Coordinator

Responsible for recruiting and maintaining a staff of volunteers/docents. Duties include scheduling docents for on-and off-grounds activities and keeping docents abreast of new developments to relate to the public.

Docent/Volunteer

Duties may include diet preparation, small animal care, teaching educational programs, leading group tours, and staffing special events.