



## **Animal Observations**

Grades 4-6  
Teacher Packet

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## **Animal Observations**

Grades 4-6: Take the scientific method out of the textbook and put it into practice in this hands-on exploration of animal behavior. Discover why we study ethology, and participate in a behavioral study of one of the Zoo's animals.

## **Academic Standards for Science and Technology**

### **3.2. Inquiry and Design**

- 3.2.4    A    Explain basic systematic elements of scientific research.
- C    Recognize and use the elements of scientific inquiry to solve problems.



## **BACKGROUND INFORMATION**

### **What is Ethology?**

In its simplest terms, ethology is the study of animal behavior using the scientific method. By studying animals, humans are able to understand more accurately the specific behavior patterns that each species has developed to suit their unique environment. Although the animals at the Pittsburgh Zoo and PPG Aquarium live in a captive environment, much can still be learned including reproductive behaviors, infant development, maternal instincts, and social behaviors. Ethology helps zoos to ensure that their animals are living in a safe and healthy setting. Because ethology focuses on specific animal behaviors, it has been responsible for the development of captive breeding programs, such as the American Zoological Association's Species Survival Plan, which breeds endangered species, some of which were once thought unlikely to reproduce in captivity. Ethology has also become an important form of education, for both scientists and the public. This knowledge has played an important role in the conservation and appreciation of our natural world.

### **Ethology and the Scientific Method**

Many historical biologists and naturalists relied simply on note taking as their source of data when studying animal behavior. They would record data for a period of time and would then disseminate their findings based on their results and scientific knowledge. Unfortunately, this method proved very unsystematic and often produced inaccurate conclusions. However, like most sciences when they mature, ethology has become much more method oriented. Ethology is now governed by specific guidelines, known as the scientific method, that need to be followed in order to ensure usable and accurate results. The steps of the scientific method for our studies will be as follows:

1. Identify the Situation: Identify the situation, behavior, or problem you wish to explore.
2. Questioning: Develop a clear specific question that can be tested.
3. Background Research: No scientist ever goes through an extensive study without finding out what already has been studied. Be familiar with what you are trying to find out.
4. Forming a Hypothesis: Make a prediction or your best guess, as to the solution or answer to your question.
5. Test Development: Plan the materials that you will need and the steps you will need to take to test your hypothesis.
6. Data Collection: Formulate an ethogram. Follow through on your test. Pay special attention to detail.
7. Results: Record and analyze the results of the test.
8. Conclusion: Disseminate your information. Should you wish to continue your study, you will need to re-write your hypothesis.

The following activities are developed to focus on the different steps of the scientific method. These should be used as a fun and enjoyable resource to prepare students for their upcoming visit to the Pittsburgh Zoo and Aquarium.



## Vocabulary

**Adaptation** - a behavioral or physical change that improves a plant or animal's chance for survival.

**Behavior** - actions or reactions of animals under specified circumstances.

**Biodiversity** - the variety of life on our planet.

**Carrying capacity** - the maximum number of healthy individuals within a species that a habitat can sustain.

**Competition** - the situation that arises when more than one organism has a need for limited resources.

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

**Ecology** - the study of the interrelationships among organisms and their environment.

**Ecosystem** - an ecological community together with its environment, functioning as a unit.

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

**Ethogram** - a detailed list of an animal's behaviors.

**Ethology** - the study of animal behavior.

**Extinction** - the complete loss of a species.

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

**Niche** - the role played by an organism in a biological community.

**Poacher** - one who hunts or fishes illegally.

**Prehensile** - a body part that is able to grasp or hold onto something (i.e. lip or tail).

**Primateology** - the study of primates.

**Reintroduction** - the release of a plant or animal into its natural range.

**Scientific method** - a method of study used by scientists to discover the answers to questions, form conclusions, and create new hypotheses about an object of study.

**Tropical Rainforest** - an area of forest located in the tropics that receives 100 inches or more of rain per year, rich in biodiversity, and found near the equator.



### ***Suggested Reading List***

The Chimpanzee Kid by Ron Roy  
Jeremy and the Gorillas by Lilian Bourd  
The Jungle Book by Rudyard Kipling  
Gorilla: A Vanishing Species by Karen Williams  
Extremely Weird Primates by Sarah Lovett  
Canopy Crossing by Ann Whitehead Nagda  
Lemurs: On Location by Kathy Darling  
In Quest of the Sacred Baboon by Hans Kummer  
Cecily G. and the Nine Monkeys by Hans Augusto Ray  
Kratt's Creatures: To Be a Chimpanzee by Chris and Martin Kratt

### ***Teacher's Resources***

Endangered Animal Babies by Thane Maynard  
How the Environment Works by Preston Gralla ( )  
Mountain Animals in Danger by Gary Turbak  
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

### ***Internet Resources***

The Gorilla Foundation: [www.koko.org](http://www.koko.org)  
Dian Fossey Gorilla Fund: [www.gorillafund.org](http://www.gorillafund.org)  
Primate Conservation Inc.: [www.primates.org](http://www.primates.org)  
Curriculum Web: [www.curriculumweb.org](http://www.curriculumweb.org)



## **Create an Ethogram**

### Pre-Visit Activity

#### **OBJECTIVES:**

- TSW create an ethogram.
- TSW describe how an ethogram is useful to researchers.

#### **MATERIALS:**

- paper and pencils
- chalkboard or large chart paper and markers
- clip boards and stopwatches are optional
- sample ethograms (found in Post-Visit Activity)

#### **PROCEDURES:**

##### **Anticipatory Set**

Discuss the definition and purpose of an ethogram.

- A. An ethogram is a detailed list of an animal's behavior.
- B. The researcher observes the behavior, names the behavior, assigns the behavior a code or abbreviation, describes the behavior and categorizes the behavior.
- C. How would this be helpful to researchers? An ethogram is used to organize the animal's behaviors into categories so that researchers can discover how each behavior helps the animal to survive, mate and reproduce.

##### **Development of Lesson**

- A. Ask the students to name the following behaviors:
  - The person raises one arm vertically and moves the forearm and hand from side to side.
  - The person begins from a standing position and bends forward at the waist; the person then straightens up to the original standing position.
  - The person wraps both arms around another subject and squeezes gently
- B. Ask the students to describe the following common human behaviors:
  - Kiss
  - Handshake
  - High five
- C. Students practice creating an ethogram by observing human behaviors:
  - Students sit in an area of human activity such as the library or lunchroom and list all behaviors observed for at least one half hour.



- Students bring lists back to the classroom and create one exhaustive list of human behaviors observed.
- Students name each behavior and assign each a code or abbreviation.
- Students describe and categorize behaviors.

### **SUMMARY:**

Distribute ethograms (found in Post-Visit Activity) and compare to student-made ethograms for humans.

### **EXTENSIONS”**

- Observe a family pet for at least 45 minutes. Record all behaviors and write a definition for each. Develop an ethogram.
- Using your ethogram, observe the same pet for at least an additional 45 minutes.
- Calculate the percentage of time each behavior was exhibited.
- Distribute colobus monkey data sheets and compare to family pet data sheets.
- Ethograms could also be made for animals by viewing videos.



## **Animal Behavior Scavenger Hunt**

### In-Zoo Activity

#### **OBJECTIVES:**

- TSW define behavior.
- TSW list a set of behavior.
- TSW observe animal behavior while visiting the zoo.
- TSW record observed behaviors while visiting the zoo.

#### **MATERIALS:**

- Chalkboard
- "Animal Behavior Scavenger Hunt" - attached
- Pencils

#### **PROCEDURES:**

##### **Anticipatory Set:**

- A. Begin by introducing the importance of good observation skills when researching animal behavior. Good observation skills enable researchers to accurately assess individual animal behaviors. Brainstorm with the students a list of possible animal behaviors.
- B. Ask the students to think of reasons why researchers would want to study animal behavior at a Zoo. A partial list of reasons is listed below.
  - To learn how animals communicate
  - To learn about the specific habitat requirements of a species
  - To learn about the social habits of a species
  - To monitor the health of individual animals
  - Just because it is fun!

##### **Development of Lesson:**

Using the attached Animal Behavior Scavenger Hunt, see how many behaviors you observe while viewing the animals at the Pittsburgh Zoo & PPG Aquarium. Each species in the Zoo can only be used once in completing the scavenger hunt.

##### **SUMMARY:**

Review the scavenger hunt or list. Discuss the most common behaviors observed. Were there any behaviors observed that were not on the scavenger hunt?



## Animal Behavior Scavenger Hunt

Can you find an animal at the Pittsburgh Zoo and Aquarium exhibiting the following behaviors? If you find an animal showing the behavior, write the name of the animal in the blank space next to the behavior.

- Sitting \_\_\_\_\_
- Standing \_\_\_\_\_
- Walking \_\_\_\_\_
- Running \_\_\_\_\_
- Lying \_\_\_\_\_
- Jumping \_\_\_\_\_
- Eating \_\_\_\_\_
- Drinking \_\_\_\_\_
- Chasing \_\_\_\_\_
- Preening \_\_\_\_\_
- Grooming \_\_\_\_\_
- Biting \_\_\_\_\_
- Climbing \_\_\_\_\_
- Vocalizing \_\_\_\_\_



## **A Personal Place in Nature: Keeping a Nature Journal**

### Post-Visit Activity

#### **OBJECTIVES:**

- TSW carefully observe nature and record what they see either with pictures or words.
- TSW use field guides to identify the plants/animals they observe and record in their journal. (This will pertain to higher-grade levels only.)
- TSW write a creative short story or poem based upon observations.

#### **MATERIALS:**

- Notebook for drawings and text
- Magnifying glass

#### **PROCEDURES:**

##### **Anticipatory Set:**

Address the following questions.

*What is a nature journal?* A nature journal is a book in which you record your observations, thoughts, ideas, and feelings. A nature journal often includes sketches, descriptions, poetry, and questions.

*Why keep a nature journal?* A nature journal provides an opportunity to learn about and appreciate natural settings. John Muir used his journals to share his love of nature and to enlist people's support to preserve wilderness. Muir's journals gave him a wealth of recorded experience from which ten books and over two hundred articles were published.

*How do you make a nature journal?* Nature Journals come in many shapes and sizes. Students can make their own journals from 3-ring binders and notepaper. A hard-back book works better than a soft-sided one. Some paper should be unlined for ease when drawing. Each journal entry should include the following:

- Date / Time
- Weather
- Location



### **Development of the Lesson:**

Have each student select a natural area near the school (or at home). Have them visit the same location four days in a row, for a total of 15 minutes each day. Encourage students to write in their journals, and write often. Sketches and drawings should also be encouraged. Instruct the students to not worry about grammar or spelling.

### **SUMMARY:**

Ask the students if they would like to read aloud a page from their journal. This should be encouraged, but shouldn't be forced. After all, journals are the property of the writer.

### **EXTENSIONS:**

- Have the students re-visit their natural areas during different times of the day or during different seasons.
- Increase the amount of time spent observing to a maximum of 30 minutes.