



## ◀▶ Field Trip—An Animal Behavior Study ▶◀

◀▶ **Subject/Course:** Biology II or AP Biology

◀▶ **Grades:** 11-12<sup>th</sup>

### Zoo Atlanta Field Trip Teacher Information

#### Reservations and Payment

- Reservations are required 2 weeks in advance.
- Payment is due at the admission gates when you arrive with your group. Please have all funds collected and send one person to the payment window.
- For cancellations, date changes, and refunds, please contact Education Reservations at 404.624.WILD.
- Train and carousel rides are additional and can be purchased on site.
- For frequently asked questions, please visit our website at [www.zooatlanta.org](http://www.zooatlanta.org).

#### Field Trip Guides

- Our brand new Field Trip Guides were developed by Zoo staff and experienced Georgia teachers.
- All packets are correlated with the new Georgia Performance Standards.
- Download packets that are relevant to the grade(s) you are bringing.
- Please complete and return the evaluation form with your packet so we can be sure we are meeting your needs.

#### Chaperone Guidelines

- Review the following rules with your group:
  - Stay with the chaperone at all times.
  - Follow any directions given by teachers, chaperones, and Zoo staff.
  - Do not climb on exhibits, fences or rocks or tap on the exhibits with glass.
  - Walk rather than run to avoid getting hurt and scaring the animals.
  - Pick up your trash and recycle.
  - Respect the animals – do not make loud noises.
  - Headphones or mobile phones must be turned off and put away during the visit.
  - Go to a Zoo staff member if you can't find your chaperone.
- Count your group each time you reach a new exhibit to make sure everyone is present.
- Discipline is your responsibility; consult your lead teacher if you need assistance.
- Make sure you know where and when to meet for lunch and for departure.
- Be sure to obtain a Zoo map and daily schedule from the admission booth or from your lead teacher.
- During your visit, encourage the students to ask questions, and then look for their own answers by observing the animals, reading signs and making guesses.
- Attend Zoo activities listed on the back of your map to ensure a full day.
- Have fun!

**If you have any additional questions or concerns, please visit our website at [www.zooatlanta.org](http://www.zooatlanta.org) or contact Education Reservations at 404.624.WILD.**

## Stage 1-Desired Results

### Established Goals:

- The scope of second year Biology or AP Biology is so extensive that there is little time to spend on animal behavior. By devoting one or more days at the Zoo, the study of animal behavior can be accomplished without the usual lecture and labs done at school. The AP Biology Lab on Animal Behavior can be substituted with observations and experiments performed with living animals at the Zoo.
- Georgia Performance Standards are not yet set for Biology or AP Biology. They will be added for your reference when they are posted.

### Understandings:

#### Students will understand that...

- Animals have a complex set of behaviors, innate and learned, that enhance survival.
- All living things inherit characteristics, called adaptations, which enhance their survival in their natural environment.
- In addition to physical characteristics, behaviors are also inherited as adaptations.
- Biodiversity, the great variety of living things, is the result of the evolution of living things in many changing environments.
- Animals express their behavior in mathematically predictable ways.

### Essential Questions:

- How does animal behavior dictate reproductive success?

### Students will know...

- The evolution of behavior is a result of the inherited characteristics that enhance success of the animals in surviving in a habitat while interacting with other animals and the environment.
- The difference between taxis and kinesis, instinct and learned behaviors, agonistic and antagonistic behaviors, response and analysis, and the many different displays of mating behaviors.
- Careful recording of

### Students will be able to...

- Keep honest, clear and accurate records in science.
- Record the details of behaviors they observe.
- Produce a field journal.
- Design an experiment using clearly described scientific method.
- Read across subject areas.
- Demonstrate competence in a variety of genres.
- Develop, revise, and evaluate writing.
- Use Internet resources.

observations such as aggression or play will reveal different components of the complex behaviors required for survival.

## Stage 2-Assessment Evidence

### Performance Tasks:

- Drawings
- Recording the details of the observed behaviors.
- Producing a field journal, drawing and describing observations.
- Reading and recording conclusions.
- Analyzing recorded data and recording conclusions.
- Writing and revising.
- Lab Report
- Presentations – PowerPoint, concept map, story board, etc.

### Key Criteria

- In the following sections, there are suggested activities for students that allow them to study animals. The products of these studies will provide evidence of student understanding.

### Other Evidence

- Using standard safety practices
- Categorizing relationships
- Researching and evaluating
- Participating in student-to-teacher, student-to-student, and group verbal interactions
- Preparing an itinerary
- Reading a map
- Translating language

## Stage 3-Learning Plan

### Learning Activities

#### Pre-visit Activities

Using Internet resources can be a valuable pre-Zoo preparation plan. Visiting useful websites allows the students to research the animals and endangered species and zoos, in order to prepare for a field trip to Zoo Atlanta. Below is a list of activities the students could do using the computer.

1. Research Animal Behavior at <http://www.animalbehavior.org/ABS/Education/>
2. Using the map of Zoo Atlanta at [www.zooatlanta.org](http://www.zooatlanta.org), under Visitor Information, or at [http://www.zooatlanta.org/site/visitor\\_info/zoo\\_map.htm](http://www.zooatlanta.org/site/visitor_info/zoo_map.htm), prepare an itinerary of your tour of the Zoo.
3. To add interest, the students can find a map of the route from their school to Zoo Atlanta at <http://www.mapquest.com/main.adp> OR <http://tiger.census.gov/cgi-bin/mapbrowse-tbl> , the second site being an excellent resource for geography.
4. Predict the weather on the day of the Zoo trip at <http://intellicast.com/> OR

- <http://www.weather.com/>
5. Do a search for information about specific animals at [www.aza.org](http://www.aza.org) or <http://www.google.com/>
  6. Find out which animals are endangered species and research the laws that protect them at <http://www.bagheera.com/> OR <http://endangered.fws.gov/>
  7. What do you call the babies of the animals at the Zoo? at <http://www.enchantedlearning.com/subjects/animals/Animalbabies.shtml> OR <http://www.abcteach.com/abclists/animalbabies.htm>
  8. Explore the world of animals, demonstrating biodiversity at <http://animaldiversity.ummz.umich.edu/site/index.html> OR <http://enature.nationalgeographic.com/>
  9. Find the scientific name in Latin for Zoo animals at <http://www.seaworld.org/animal-info/animal-bytes/index.htm> OR <http://www.phoenixzoo.org/zoo/animals/facts/index.asp> OR [http://www.yptenc.org.uk/docs/animal\\_facts.html](http://www.yptenc.org.uk/docs/animal_facts.html)
  10. Find the name of the animals in Spanish or French or other language at <http://world.altavista.com/>

## **Zoo Activities**

Predators or Prey? – Select and observe two carnivores and two herbivores. The behavior of these animals is very different in their natural habitats. The evolution of behavior is a result of the inherited characteristics that enhance success of the animals in surviving in a habitat while interacting with other animals and the environment.

Record the details of the behaviors that you observe with each animal. Compare and contrast these behaviors relating the behaviors to the successes of the prey and the predator.

Playing – The activities of animals which we perceive as playing are important to the survival of the animals. Playing gives the animals exercise and skills needed in hunting and mating. Play can lead to improved reasoning and problem solving. By playing, the animals learn to cooperate, coordinate and collaborate.

Record your observations of animals at play. Is there a dominant individual? Does the environment have an effect on the play? What patterns do you see in behavior? Why would natural selection favor animals that play? Continue to observe the animals and record the interactions of other animals. If the animal is alone, is there any attempt to play?

Why are some of the animals asleep while you are visiting the Zoo? Circadian rhythm is the pattern of behavior in animals controlled by internal clocks running on external stimuli, such as light/dark cycles. Most animals are active at dawn and dusk, and sleep during the middle of the day. Record in your field notebook the pattern of behavior observed in each animal. Which animals seem to be on a different cycle?

Play behaviors also involve signaling. Sounds, odors (urine, anal, foreleg glands), visual displays and touches are methods of communication. They are also used as cues that another animal is within the territory. Most animals are territorial and willing to defend its territory against intruders. Signaling is also an important part of mating behavior. Record any observations of animal signaling.

Primates – Social Hierarchy, Grooming and Parental Care – Behavior is a result of inheritance

and environmental experience. Spend some time observing the gorillas, orangutans and drills. They are primates that develop a role for each family member through behavior. A dominance hierarchy is established as agonistic behavior (through coercion, threats or fighting) leads to the establishment of leaders and followers, with food and mating taken by the leaders first.

Within the hierarchy, peace and health can be maintained with interpersonal behaviors such as grooming. As the animals clean each other of parasites, salt and knotted hair, they communicate with each other in support of their role within the hierarchy. Part of the environmental experience that is very valuable to the survival of the primates is learning parental care. The young primates observe the older parents caring for babies and are able to better care for their own young when the time comes.

Record your observations of primates. How do the primates demonstrate any of the behaviors discussed above? Some of these behaviors are innate and some are learned. Write a conclusion that demonstrates your understanding of these behaviors and the interdependence of organisms in an ecosystem.

Animal Behavior - The AP Biology Lab on Animal Behavior can be substituted with observations and experiments performed with living animals at the Zoo.

The students can observe the difference between taxis and kinesis, instinct and learned behaviors, agonistic and antagonistic behaviors, response and analysis, and the many different displays of mating behaviors. Careful recording of observations such as aggression or play will reveal different components of the complex behaviors required for survival. Observations such as these are crucial to the success of Zoo animals, so that Zoo personnel can provide the most beneficial setting for each animal.

A quick tour of the Zoo may not reveal details about animal behavior. So, slow down and really observe what is going on. Focus on a few exhibits. Plan to be at the Zoo as early or as late as possible to work around the circadian rhythm patterns. Feel free to use the included ethogram and sample data sheets to create your own or have students create their own method of recording.

Design an experiment through observations that will give you insight into animal behavior. Begin by observing a specific animal or comparing two or more species. Brainstorm questions that come up as a result of your observations. Plan an experimental activity that will answer your questions. Upon returning to school, research animal behavior to determine if your questions have been resolved. Write a lab report about your experience, or present your observations and conclusion to the class with power point, storyboard, concept map or other presentation.



### **Suggested Reading**

Booth, Jerry. 1996. You Animal! (Gulliver Green/Harcourt Brace, ISBN: 0-15-200696-6)

Bourke, Dr. Andrew. Editor-in-Chief. "Behavioral Ecology". Institute of Zoology, Zoological Society of London, Regent's Park, London NW1 4RY, UK, Published by Oxford University Press Copyright ©Oxford University Press 2004 Print ISSN: 1045-2249; Online ISSN: 1465-7279.

Bradbury, J. W. & S.L. Vehrencamp. 1998. Principles of Animal Communication (Sinauer Associates, ISBN: 0878931007)  
Curtis, Patricia. 1997. Animals You Never Even Heard Of (Sierra Club, ISBN: 0-87156-594-3)

Grzimek's Animal Life Encyclopedia - QL3 G7813 vol.1-13

Hardy, Sarah Blaffer. 1999. Mother Nature: A history of mothers, infants, and natural selection. Pantheon Books, New York. ISBN 0-679-44265-0

Krebs, John & N.B. Davies. 1993 An Introduction to Behavioural Ecology (Blackwell Scientific Publications, ISBN: 0878934286 )

Krebs, J. R. and N.B. Davies. 1993. An Introduction to Behavioural Ecology (3rd ed). Blackwell Science, Inc. 420 pp. ISBN: 0632035463.

Kuo, Zing-Yang. 1976. The Dynamics of Behavior Development: An Epigenetic View (Plenum Press, ISBN: 0306309769)

Martin, P. and P. Bateson. 1994. Measuring Behavior: An Introductory Guide. Cambridge University Press, New York. ISBN: 0-521-44614-7.

Pianka, Eric. 1999. Evolutionary Ecology (6th ed.). Addison-Wesley. 512 pp. ISBN: 0321042883.

Scott, Michael. 1996. Ecology (Young Oxford Series, ISBN: 0-19-521167-7)

Tinbergen, Niko. 1951. The Study of Instinct (Oxford University Press)

Tinbergen, Niko. 1958. Curious Naturalists (Country Life, Ltd.)

Wilson, E.O. 1992. The Diversity of Life (W.W. Norton & Co, ISBN: 0393310477)

### **Suggested Websites**

Zoo Atlanta- [www.zooatlanta.org](http://www.zooatlanta.org)

Association of Zoos and Aquariums - [www.aza.org](http://www.aza.org)

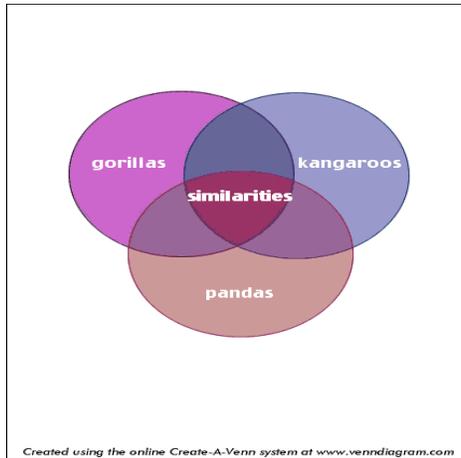
### **Graphic Organizers**

The following charts and graphic organizers are examples of supplementary materials for use in assessing student understanding.

1. KWL chart. Use this chart to display: K - the information that the student already knows. W- the information that the student wants to learn during the field trip. L - the information that the student does learn during the field trip.

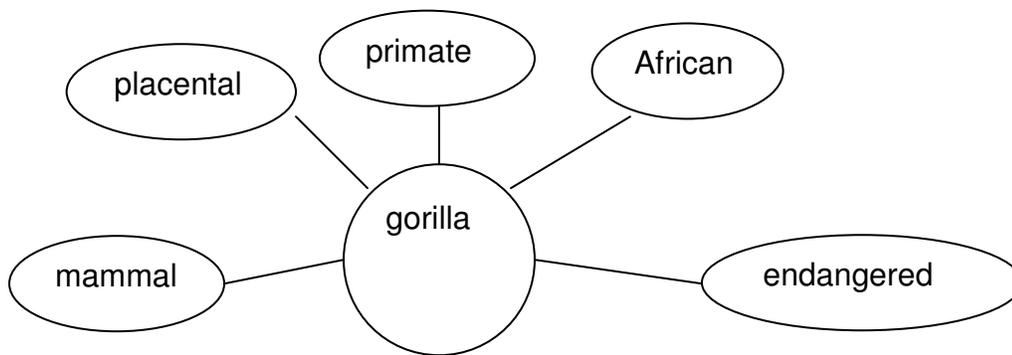
K	W	L

2. Venn Diagram. Used to display the similarities and differences between two animals, habitats, etc. Example:



3. Concept Map. A concept map provides a tool for the student to demonstrate an understanding of concepts by allowing the student to display extensive information in a concise manner.

Example:



4. Compare and Contrast. The students will gain a better understanding of animal characteristics by observing the similarities and differences between species of animals.

Example:

The animals are alike:

The animals are different:






## Sample Data Collection Sheet

Observer John Doe Focal Animal Peacock

Date 9/20/99 Time 10:00 Weather Sunny

TIME	BEHAVIOR										LOCATION					
	SS	S	SSi	LW	LF	SG	F	V	O		1	2	3	4	5	NV
10:00	X										X					
10:01	X										X					
10:02	X										X					
10:03			X				X				X		X			
10:04					X									X	X	
10:05					X								X	X		
10:06			X									X	X			
10:07								X						X		
10:08								X						X		
10:09								X						X		
10:10								X						X		
10:11								X						X		
10:12								X						X		
10:13								X						X		
10:14				X			X	X			X	X	X	X	X	
10:15			X								X					
10:16		X									X					
10:17		X									X					
10:18		X									X					
10:19		X									X					
TOTAL	3	4	3	1	2	0	2	8	0		10	2	4	10	2	0



**RUBRIC**

	<b>Exemplary 4</b>	<b>Accomplished 3</b>	<b>Developing 2</b>	<b>Beginning 1</b>
<b>Tasks</b>	Consistently demonstrates the ability to perform tasks.	Usually demonstrates the ability to perform tasks.	Sometimes demonstrates the ability to perform tasks.	Rarely demonstrates the ability to perform tasks.
<b>Use of Scientific Language</b>	Consistent, accurate usage of terms.	Adequate usage of scientific terms.	Occasional use with few errors.	No terms or frequent errors in usage.
<b>Concepts</b>	Demonstrates full understanding of concepts.	Displays a complete and accurate understanding of concepts.	Displays an incomplete understanding of concepts.	Demonstrated severe misconceptions about concepts.
<b>Teamwork</b>	Assumed leadership role within group; strong contributions.	Participated with good contributions.	Participated with weak contributions.	Did not participate in group discussions.
<b>Application to the Real World</b>	Able to apply learning.	Usually finds practical application.	Occasionally relates to real life skills.	No practical application.
<b>Communication</b>	Uses rich, vivid, and powerful description in a variety of ways to clearly communicate observations, data, and conclusions.	Consistently communicates information effectively through accurately recording and describing observations and conclusions.	Communicates plausible facts but lacks clarity in presenting facts and observations.	Is ineffective in communicating information.
<b>Presentation</b>	Presents information in logical, interesting sequence; demonstrates full knowledge (more than required); Maintains eye contact; Uses a clear voice; pronounces words correctly.	Presents information in logical sequence; Feels at ease with expected answers; Maintains eye contact most of the time. Voice is clear; pronounces most words correctly.	Audience has difficulty following presentation because student jumps around; Student is uncomfortable with information; Occasionally uses eye contact; Voice is low and incorrectly pronounces terms.	Audience cannot understand presentation due to no sequence; Does not have grasp of information; Reads all of the report with no eye contact; Mumbles or incorrectly pronounces terms.