

Evolution –

Student Copy

Background

As an expert in the field of animal behaviour and physiology, you have been hired by the Department of Nature and Development to be the only scientist on board the Futuristica, the first ever spaceship that can travel in time into the future. In preparation for travelling to Earth 3 Million years into the future, you will need to gather data at the zoo. Once you arrive in the future your job will be to write a documentary describing the environmental conditions on Earth, along with the appearance, lifestyle and evolutionary story of an animal. Plan and prepare carefully, as death may await you.

Assignment

Your assignment consists of three parts.

1. Mission preparation at the zoo (data)
2. Scientific notes (short and sweet)
3. Documentation (the story)

Part 1: Mission Preparation at the Zoo

This section will be completed on the Observation sheets attached to this form!

Objective

Based on the data you gathered at the zoo and on your observations of this animal recorded in your scientific notes you will have to come back and give a brief description of the animal's evolutionary story.

Part 1: Mission Preparation at the Zoo – Observation sheet

In order to gather some understanding of the different environments, their climate and wildlife (both fauna and flora), you should visit at least two of the zoo’s zoogeographical pavilions/areas. There are five zoogeographical areas at the zoo: Eurasia, Indo-Malaya, Australasia, Americas and Africa.

Activity – 30-45 minutes

In your notebook, set up a table similar to this one and fill in the appropriate information.

TASK	Name of area #1	Name of area #2
	OBSERVATIONS WRITTEN OR DRAWN	OBSERVATIONS WRITTEN OR DRAWN
Notice your surroundings: Temperature, humidity, smells (Read some of the signs! They help.)		
Notice some of the common features in plants: Height, leaf size and shape, colour. Questions to keep in mind: What proof of adaptation can you see? How did these plants adapt? What are the selection pressures? Is there evidence of convergent evolution?	Hint: You may want to make observations such as: “Where humidity is high and light is low (rainforest), leafs tend to be _____ where humidity is low and light levels are high (savannah) leaves tend to be _____.	
Notice the animals of this region. Look at a few (3-4) different species and how they have adapted to the environmental conditions. (ex: diet, features, size etc) Read the signs! Some speak about specific types of adaptations and variations!		

If completing Part 2 and/or Part 3:

This information will serve to give you ideas about the different components you need to consider when describing the futuristic environment and will show you some adaptive trends in animals in specific environments that can help you predict the way your futuristic animal may adapt.

Hint: Do not focus on mammals only! Observing fishes and reptiles could help when you decide on the diet of your animal.

To choose your animal! Check the appendix for help!

If you are completing Parts 2 and/or 3 read the following, otherwise skip to “Activity”
Pick the ancestor animal of the one you will be describing in Part 2 and 3. For example, if you love tigers and want to come up with the evolution story of a new tiger species, complete your observations at the zoo on a tiger and a related animal, such as another big cat (feline). The objective of this exercise is for you to be able to make inferences about the variation (both physical and behavioural) of related animals living in different environments. These inferences in turn can lead to logical and data based conclusions about the evolutionary trends of your animal.

Remember: Evolution is an interaction of existing forms and environmental challenges. Not all features of an organism are current adaptations. Many are just inherited and may be adaptively neutral.

Activity – 30-45 minutes

Chose an animal you are interested in observing. In your notebook, set up a table similar to this one and fill in the appropriate information

The animal I wish to observe and eventually write about is the _____.

TASK	My animal: OBSERVATIONS WRITTEN OR DRAWN	Related animal: OBSERVATIONS WRITTEN OR DRAWN
Notice the characteristics, both physical and behavioural of the animal. (size, feet, location of eyes, ears, body covering, colour teeth, tail, diet, is it a predator or prey)		
Notice the specific ways in which each animal adapted to its environment. Do they have one ancestor? If yes, can you find examples of divergent evolution? Of parallel evolution? Are they different species that have undergone convergent evolution as a result of similar ecological roles and selection pressures?		

Part 2: Scientific Notes

Step 1. You have just arrived in 3M and are still alive to observe and tell what the environment around you looks like, compared and contrasted with the environment you just left behind. (ex: changes in climate, vegetation, animal life) By the way, you could easily have landed in a large body of water.

Step 2. You have spotted an animal that you think may be a descendant of an animal you studied at the zoo in preparation for this mission. You obtain a DNA sample and quickly realise that you are brilliant in your assumptions. In your notes you jot down a brief description of the animal's physical appearance (ex: size, feet, location of eyes, ears, body covering, colour (are males and females different), teeth, tail, size of extremities, method of locomotion, special features if any...) and how it differs from its ancestor. You may want to draw a quick sketch. **HINT:** Think of your animal as an animal that could adapt to changes with relative ease and can even alter its diet if necessary. The catch however is that every decision you make regarding the animal's appearance, behaviour and ecological role must be based on an aspect of natural selection. Keep in mind that **evolution does not cause change to occur, but is rather a result of pressure upon the members of a population.**

Step 3. You remember that evolution can be behavioural as well as physical and so decide to spend time on observing the behaviour of the animal (ex: lives in isolation or in groups, passive or aggressive, when is it active). What is the ecological role of the animal (ex: diet, is it a predator or prey, how does it fit into the food web)?

Step 4. You use your AST (Awesome Scientific Tool) to quickly scan the environment and download information on the selection pressures exerted on the animal (sexual selection, availability of habitat, food, prey-predator ratios, competition, diseases). You include a printout of the data in your notes. You are now ready to return to the present and prepare your report. CONGRATULATIONS! You have survived the mission.

Part 3: Documentation – The Story

This Part of your assignment is the write-up/discussion of your findings.

There are no limitations on the details you can include into your paper, but it should follow some specific guidelines. Your story:

- Should be 500 words or less
- Should incorporate the data you gathered at the zoo as evidence (ex: observation suggests that animals living in warm climates have a ____ body size than animals living in warmer areas. It is therefore not surprising that in this environment...)
- Should incorporate at least two concepts from the “Concept List”. As you incorporate each concept, you must demonstrate its relevance to your story.
- Can be presented in any form. For example you can expand the field notes to include the evolutionary story. It could be presented as a pamphlet, or a magazine article like National Geographic, or even as a poster. Be creative.
- Can include graphics and illustrations. Be sure to site the sources and give credit for the material, including material taken from the Internet.

Important:

When incorporating concepts from the “Concept List” into your story, you must elaborate on how they relate to your story. Simply including a concept word in your assignment is not acceptable. For example stating, that “the animal became a carnivore because of selection pressures” is not sufficient. You must explain what those pressures were and how they influenced the evolution of the animal.

Concept List:

1. Natural selection: convergent evolution **or** parallel evolution **or** divergent evolution
2. Adaptation/ Adaptive radiation
3. Variation within species
4. Selection pressures and their roles
5. Punctuated equilibrium
6. Gradualism

APPENDIX

List of animals and some helpful hints about signs!

Name/Type of animal	Location in the zoo	Concept connection READ THE SIGNS!!!
Plants		
Plant life	All pavilions	Adaptation
Fish		
Cichlids (fish)	Darwin's Dream Pond African pavilion	Adaptive radiation
Aba aba (electric fish)	African Pavilion	
Anemone fish	Australasian Pavilion	Symbiosis
Piranha (fish)	American Pavilion	
Reptiles		
Komodo Dragon	Australasian Pavilion	Top of food chain
Malayan water monitor	Indo Malaya Pavilion	
Miscellaneous Mammals		
Elephants	African Savannah	Adaptation (meet the keeper)
Pygmy Hippopotamus	African Pavilion	Adaptation
Hippopotamus	African Savannah	
Naked Mole rats	African Pavilion	Convergent evolution (bee)
Meerkat	African Pavilion	Adaptation
Gr. Indian Rhinoceros	Indo-Malaya	Adaptation
White Rhinoceros	African Savannah	
Polar Bear	Near Americas Pavilion	Behavioural Adaptation (meet the keeper)
Primates		
Orangutan (great ape)	Indo Malaya Pavilion	
Gorilla (great ape)	African Pavilion	Adaptation (meet the keeper)
Mandrill (primate)	African Pavilion	Sexual selection
Olive Baboons (primate)	African Savannah	
Lion-tailed Macaque	Indo-Malaya Outdoor	Adaptation
Marmoset (primate)	American Pavilion	
White-headed Saki	American Pavilion	Sexual selection
Spider Monkey (primate)	Americas Outdoor	
Big Cats		
Cheetah	African Savannah	Adaptation
Lion	African Savannah	Behavioural Adaptation
Jaguar	Americas Outdoor	Adaptation
Clouded Leopard	Malayan Woods Pavilion	Adaptation
Snow Leopard	Eurasia Outdoor	
Siberian Tiger	Eurasian Outdoor	
Sumatran Tiger	Indo Malaya Outdoor	

Evolution – **Teacher's notes**

Grade Level
12 University Prep

Subject Area
Biology, Evolution

Duration
This activity involves three parts. It can be a one-day zoo visit or a 3-day culminating activity

Setting
Classroom, Zoo

Skills
Gathering information
Interpreting data
Synthesis and application of evolutionary concepts

Within the course
Depending on the teacher, this activity can be used as a review for the unit or as a culminating activity

Vocabulary
There is a glossary of terms included with the activity

Introduction

This activity is designed to measure the understanding students have gained at the end of the unit on evolution.

Students are given choices and the final assignment has few restrictions in order to cater to the needs of different learners and to promote creativity. Based on 'research' conducted at the zoo, students are asked to write the evolutionary story of an animal found in the future, 3 million years from today.

Objectives

Students will:

- gain a better understanding of the principles of evolution
- have a better understanding of the evidence in support of evolution
- collect and interpret simple data sets
- apply concepts of evolution to produce an evolutionary story
- find concrete examples and uses for abstract concepts

Materials

In the classroom:
- copy of activities

At the zoo:

- note book and pen/pencil, observation sheets (provided with activity)

Curriculum connection

EV1.03 analyse evolutionary mechanisms

EV1.04 explain, using examples, the process of adaptation of individual organisms to their environment

EV2.01 outline evidence and arguments pertaining to the origin, development, and diversity of living organisms on Earth

EV2.02 identify questions to investigate that arise from concepts of evolution and diversity

EV2.05 – formulate and weigh hypotheses that reflect the various perspectives that have influenced the development of the theory of evolution

Prior knowledge

Prior to visiting the zoo, students are required to know and understand evolutionary concepts, such as convergent/divergent and Parallel evolution, adaptation, adaptive radiation, selection pressures and their roles, gradualism vs. punctuated equilibrium

Procedure

Although not necessary, the general suggested pre-zoo activity is a good introduction to the purposes of modern zoos. Through the activity students can explore their own attitudes towards animals in captivity and the overall effectiveness of the zoo.

The Activity

The activity consists of three parts:

1. Mission Preparation = data gathering at the zoo
2. Scientific notes = questions to answer
3. Documentation = the evolution story of the fictitious animal

The data gathering at the zoo is an integral part of the activity and can not be omitted, however it is up to the teacher whether the rest of the activities are used or not.

Recommendations:

Part 1 of the activities can be used on its own to review and make concrete the evolutionary concepts studied in class prior to arrival at the zoo.

Duration: **1-2 periods** including zoo visit.

Part 1 combined with Part 2 can be used to review concepts and based on the data gathered allow students to predict future

trends in evolution. Duration: **1-2 periods** including zoo visit.

Part 1, 2 and 3 together provide students with an end-of-unit culminating activity that draws on the students' abilities to gather information, integrate the information to predict future trends, and draw on an understanding of concepts in evolution to present a creative analysis of the factors that govern evolutionary change.
Duration: **1-4 periods** including zoo visit.

Assessment

Regardless of the activity sequence chosen, follow up discussion in the classroom is recommended. Part 1 and 2 of the activities can be assessed for completion, or if completed independent from Part 3 can be evaluated based on a rubric. (see sample) When combined with Part 3, the other two parts can be assessed for process, while part 3 can be

the final product and can be evaluated based on a rubric or checklist or can be part of an oral presentation. A possible rubric is included with the activity.

Modifications

These activities can be modified to suit the special needs of students in the following way:

- Students needing more directed instructions can be assigned a specific animal to observe and write about
- Parts of the activity can be omitted
- Students can work in pairs
- Specific tasks can be assigned to students working in a group

- Rather than have students record observations in their notebook, observation sheets can be developed (this will allow for the teacher to determine how much or little students should write)
- As an extra, students can be asked to research local efforts in preserving our biodiversity

Resources

www.indiana.edu/~ensiweb/
www.enc.org/weblinks/
www.biozone.co.uk/links.html
home.planet.nl/~gkorthof/

Evaluation Rubrics

Activity	Level 1	Level 2	Level 3	Level 4
<u>Mission Preparation</u> Environmental	Student has visited one pavilion and has recorded some of the required information in observation chart	Student has visited one pavilion and has recorded all required information for the one area	Student has visited two pavilions and has recorded some of the required information in observation chart	Student has visited two pavilions and has recorded all required information in observation chart
Animal	Student has observed animals but did not record adequate information to come to any conclusions	N/A	N/A	Student has observed two animals and has recorded relevant observations in chart

Activity	Level 1	Level 2	Level 3	Level 4
<u>Scientific notes</u> Environmental description	Students has described futuristic environment but did not provide adequate detail or comparison to present	Student has described futuristic environment but has not compared nor contrasted it to present	Student has described futuristic environment and has compared it to present day environment	Student has described in detail futuristic environment and has compared and contrasted it with present day environment
Description of animal	Students has described futuristic animal but did not provide adequate detail or comparison to present	Student has described futuristic animal but has not compared nor contrasted it to present day version	Student has described and/or sketched futuristic animal and has compared it to present day version	Student has described and/or sketched in detail futuristic animal and has compared and contrasted it with present day version
Behaviour	Student identified 1-2 behavioural trends but did not identify ecological role of animal	Student has described (2-3) behavioural trends but did not identify ecological role of animal	Student identified some (2-3) behavioural trends and ecological role	Student has described at least four behavioural trends and identified ecological role of animal

 **TorontoZoo**
Evolution Activity, Grade 12

Selection pressures	Identified less than 3 selection pressures with or without “printout”	Identified 3-5 selection pressures but did not include “printout”	Identified 4-6 selection pressures and included “printout”	Identified 6 or more selection pressures and “included printout”
Activity	Level 1	Level 2	Level 3	Level 4
<u>The Story</u>	Student has integrated some data, however it does not provide evidence in support of evolutionary changes described	Student has integrated appropriate data with some success, but it does not provide evidence in support of evolutionary changes described	Student has integrated appropriate data with some success, however it does not accurately support evolutionary decisions made	Student has successfully integrated the accurate data gathered at the zoo to support assumed evolutionary outcomes
	Student has incorporated one concept and demonstrated its connection, however the relevance is unclear	Students has incorporated one concept and demonstrated its connection and relevance to the story convincingly	Student has incorporated two concepts, and demonstrated their connections, however the relevance to the story is unclear	Student has incorporated two concepts and has demonstrated its connection and relevance convincingly
	Student did not express creative planning, much improvement is needed in presentation of work	Student has demonstrated creativity, however there is improvement needed in the presentation of the work	Student expressed creativity in presentation method chosen with some attention to detail	Student expressed creativity. It is clear that effort and planning were part of this work

GLOSSARY

ANIMAL ADAPTATION – EVOLUTION

****Allen’s Rule** – Animals living in tropical areas will have longer limbs, ears, noses and other extremities than related animals in a colder climate. Longer extremities allow the blood to move a distance from the body for cooling. ie: think about elephants

Adaptation - a structure, behaviour, or other feature of an organism that enables it to survive or reproduce successfully under existing environmental conditions

or

the process by which organisms are modified over many generations by natural selection to become better fitted to their environment or to retain fitness under changing environmental conditions

Adaptive radiation – the evolution from a common ancestor of a number of species specialized for survival in diverse environments

Analogous structures – structures of similar function (and sometimes appearance) that result from convergent evolution rather than common ancestry ie: bat and butterfly wings

****Bergman’s Rule** – Warm-blooded animals (generally mammals and birds) that live in colder regions tend to be larger in size than their counterparts in warmer climates. A larger animal has a relatively smaller surface area in proportion to its volume and is therefore able to conserve heat better than a smaller animal of similar shape.

Coevolution – the evolution of two species in close association such that they reciprocally influence one another’s adaptations

Convergent evolution – the process by which unrelated organisms exposed to similar environments and selective pressures come to resemble one another

Evolution – the process by which populations of organisms change over time through such mechanisms as mutation, natural selection, and genetic drift.

Homologous structures – structures found in different species that have similar form or configuration because of the species’ common ancestry. Ie: human arm, bird wing

Sexual selection – a natural selection process in which traits that give an animal advantage in the competition for mates tend to be passed on to offspring

Species – a natural population that produces fertile offspring and is reproductively isolated from other groups

**** Allen’s and Bergman’s Rules are generalizations. Although these patterns hold true in many cases, the list of exceptions is extensive. Some recommended articles dealing with this issue are:**

Forsyth, Adrian. Mammals of the Canadian Wild. Camden House Publishing Ltd. 1985.p 139-142.

Mitchell, Alanna. Bad evolution. Globe and Mail. May 4, 2002.

Suggested Pre-zoo activity

Time needed: 35 minutes (or more)

Type of activity: pair-share, small-group (approximately 2-3 students)

Objective: encourage students to think about and evaluate the roles of animals in our society and the purposes of zoos along with their own attitudes or stands toward zoos

Materials needed: a set of 8-16 statements and a mode of ranking (either *above the line-below the line* or *diamond* style ranking system)

Special note: In order to manage time, teacher can chose to use any number of the statements as long as the 4 core statements listed bellow are included.

Task: students work together to rank the statements about the treatment of animals. They should work together and try to negotiate a consensus, but if this is impossible they can either leave out the particular statement or write down a few lines in their notes as to why they would place them in a different category.

Debrief: during the debrief students can share their opinions and potential difficulties about the ranking process. Discussion then should focus on the four objectives of zoos and how they ranked using animals for the establishment of each of these objectives. For example, how many students thought that keeping wild animals in zoos for purposes of amusement was acceptable? How many agree that animals kept in captivity with a purpose of studying ways these animals can be reintroduced into the wild is acceptable? Finally students can take a stand in their opinion about zoos in a *four-corners* activity.

Zoo's objective	Statement from list
Research	Exchange of animals in zoos for breeding purposes and research that ensures genetic diversity for future generations
Education	Educating the public through captive animals and confiscated trade items
Conservation	Keeping animals in cages to study breeding strategies, nutrition, and behaviour in order to reintroduce animals back into the wild
Recreation	Keeping wild animals in zoos, circuses, aquariums and aviaries for purposes of amusement

Conclusion: the focus of this activity should be to point out to students the zoo's commitment to research, conservation, and education in addition to recreation. Visiting the zoo in order to further educate ourselves (and potentially others) about wild animals, the interdependence of ecosystems, the impact of human activity on the environment, conservation efforts and other relevant topics can make the experience worth while and the greater mission of the zoo successful!

History of the zoo:

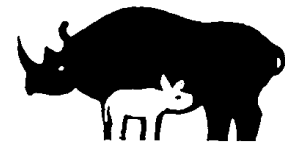
Zoos evolved independently in many cultures. The earliest may have been 4300 years ago in the Sumerian city of Ur. In the past two decades zoos have moved away from the traditional purposes of entertainment and now include conservation programs and other initiatives.

Toronto Zoo

- 280 hectares (710 acres)
- 1,200,000 visitors per year (150,000 student visitors per year)
- Zoogeographic in structure
- Zoogeography - Fauna regions are outlined by barriers to animal movement

Species Survival Plans (www.aza.org/conscience/)

- The mission of the American Zoo and Aquarium Associations Species Survival Plan program is to help ensure the survival of selected wildlife species



Species Survival Plan

Strategies

- scientifically-managed captive breeding programs
- cooperate with other institutions and agencies to ensure integrated conservation strategies
- develop and implement strategies to increase public awareness of wildlife conservation issues
- Develop and test various technologies relevant to field conservation
- Reintroduce captive-bred wildlife into restored or secure habitats
- Toronto zoo is participating in over 25 SSP's

The Contribution of Field Research

- 32 ongoing research projects for studies of breeding strategies, nutrition, behaviour, and seasonal adjustments

The Zoo's Role includes Conservation

- 27 local/international conservation projects
- 30 projects supported by the Zoo's Endangered Species Fund
- some of the species include: Karner Blue Butterfly, Trumpeter Swan, Puerto Rican Crested Toad, Black-footed Ferret, Vancouver Island Marmot

...but the zoo's efforts are only part of the solution

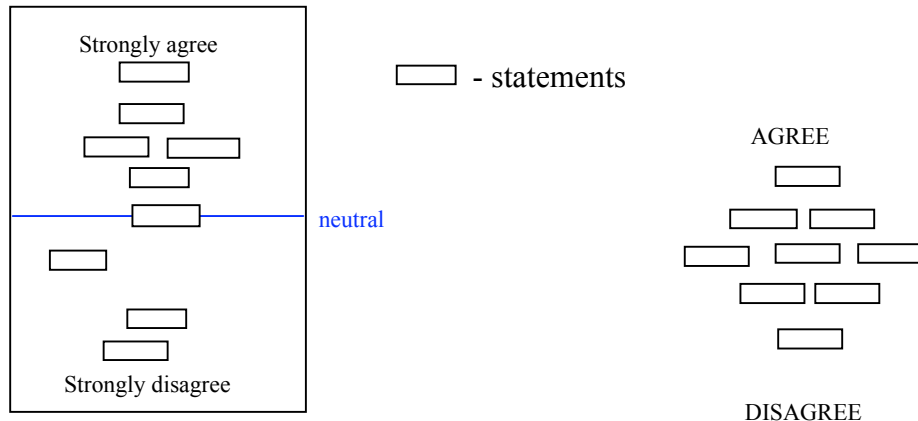
Of the 46,000 known vertebrate species alive now, zoos can maintain a maximum of 800 in viable captive populations... about 0.017%


TorontoZoo
 Evolution Activity, Grade 12

Using animals for scientific experiments to test whether cosmetics and toiletries (perfumes, shampoos, etc.) are safe for human use	Hunting and trapping fur animals so their skins can be used to make fur coats and hats
Keeping wild animals in zoos, circuses, aquariums and aviaries for purposes of amusement	Using animals for military experiments to test the effects of new weapons of chemical, gas and biological warfare
Intensive rearing of animals inside factory farms for eventual slaughter and consumption as food	Using animals in scientific experiments to find cures for human diseases such as AIDS and cancer
Using animals as beasts of burden for riding and pulling carts, carriages and ploughs. Riding animals in zoos.	Exchange of animals in zoos for breeding purposes and research that ensures genetic diversity for future generations
Educating the public through captive animals and confiscated trade items (ex: gorilla hand ashtray, rain sticks, ivory items)	Keeping animals in cages to study breeding strategies, nutrition, and behaviour in order to reintroduce animals back into the wild
Using specifically-bred and purpose-trained dogs to assist disabled people	Hunting and fishing for pleasure: the thrill of the chase and catch
Using specially bred and freshly killed animals for dissection in school biology lessons	Rearing of animals in free-range conditions (open yards and fields) for eventual slaughter and consumption as food
Using animals in television commercials as a means for promoting products	Neutering and spaying animals (pets)

ABOVE-THE-LINE, BELOW-THE-LINE

This activity involves taking a piece of paper with a line running along the middle, and labeling one side of the line *strongly agree* and the other *strongly disagree*. Instead of paper, a piece of tape on the desk can also serve as a division between the two sides. Students can use this set up to make decisions about the statements given to them. The statement they agree with the most will be furthest from the line. If the students feel indifferent about certain statements they can place them on the line, although the general idea is for students to take a stand.



DIAMOND RANKING

Diamond ranking is similar to the previous activity, however it is more lenient, as students can place many statements at the same level. This means there is less prioritizing and for some students perhaps less pressure. When working together with other students to reach a consensus the diamond structure might prove more accommodating. Although diamond ranking most often involves 9 statements arranged in the above pictured configuration, students can take more freedom with their statements.

Teaching Strategies

- Distribute one set of materials for each group of 2 students
- Allow about 10 minutes for students to agree on a mutually acceptable ranking
- After groups may pair with other groups to continue the dialogue
- You may need to mediate the tone of the discussions, as the debates can become animated
- Students should try to reach a consensus. Stress this is a difficulty often faced by policy makers

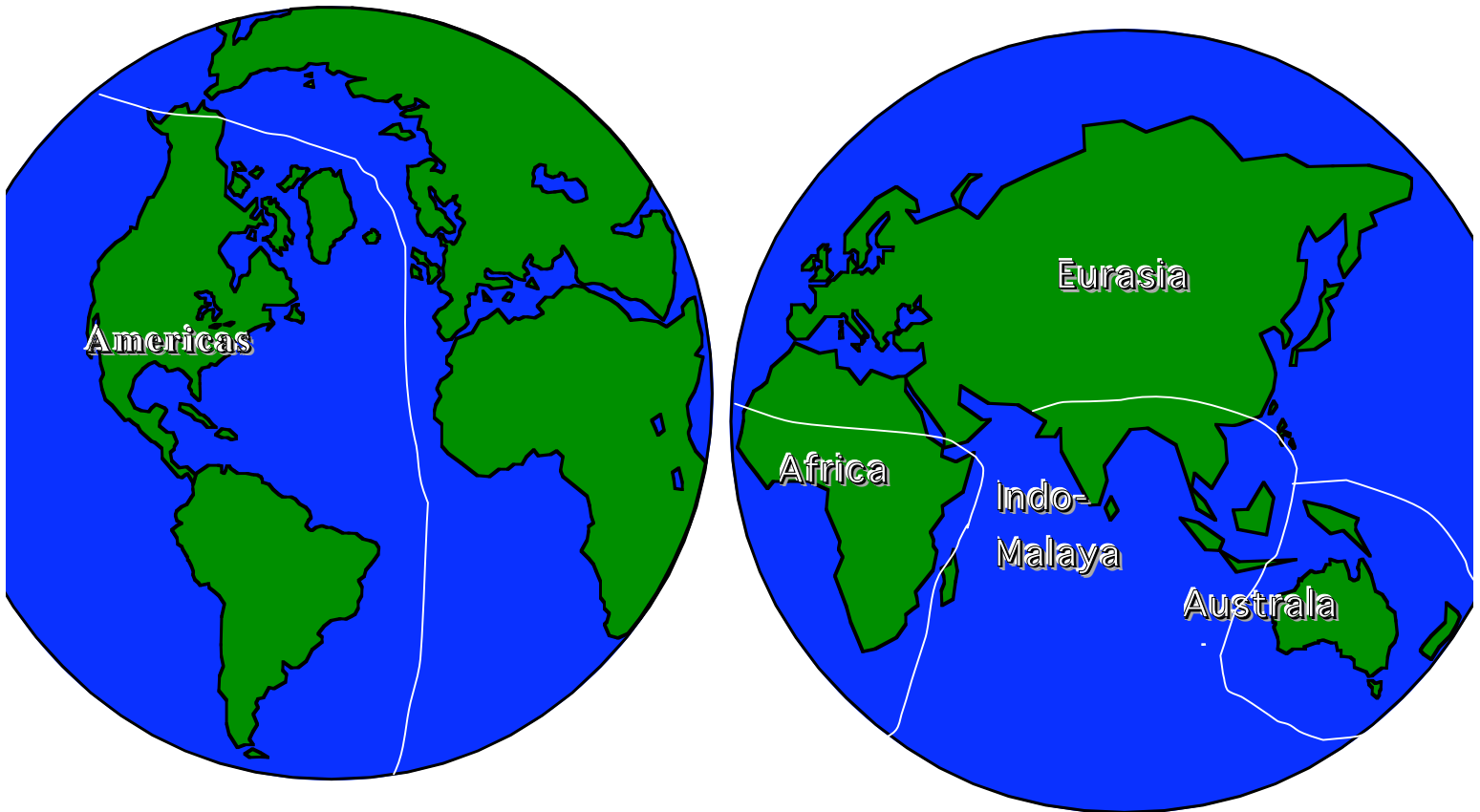
FOUR-CORNERS ACTIVITY

This activity can follow debrief or discussion periods. Essentially, students are prompted once again to decide whether they *Strongly agree, Strongly Disagree, Agree or Disagree* with the issue that was raised, in this case whether the zoo's objectives justify its existence and treatment of animals. By designating the four-corners of the room to represent the four stands, students can get a visual sense of where their fellow classmates stand on the issue. One way this activity can prove truly powerful is if it is run prior to the class activity and is repeated after it. It is interesting to observe whether students have changed their mind about issues after they have had a chance to learn more about them through the sharing of opinions in discussion.

Teaching Strategies

- Ask students to make their decision without consulting their classmates
- Give the students 1 –2 minutes to make their decision.
- Emphasize there is not right or wrong answers and the goal of the exercise is to understand the complexities of the issue.
- You may wish to participate or even represent a less popular opinion in order to stimulate the exchange of ideas

Fauna regions are outlined by barriers to animal movement.



Zoogeographic Regions – immense regions of animal dispersal, created because animals tend to disperse over the Earth but come up against natural barriers of rivers, oceans, forests, mountain ranges, and zones of extreme temperatures or rain fall. The generally recognized zoogeographic regions used by biologists have been slightly modified by the zoo as follows:

- Palaearctic region (Zoo: Eurasia)
- Nearctic Region (Zoo: Americas)
- Oriental region (Zoo: Indo-Malaya)
- Neotropical Region (Zoo: Americas)
- Australian region (Zoo: Australasia)
- Ethiopian Region (Zoo: Africa)

 **Toronto Zoo**
Student Activity Evaluation Form

Please let us know how useful you found these activities. When you return a completed evaluation to us we will send you an attractive poster about gorilla reproduction and endocrinology. *Please return to:*

Education, Toronto Zoo
361 A Old Finch Ave.
Toronto, ON M1B 5K7
FAX: 416-392-5948

Date: _____ Grade Level: _____.

Subject: _____, Your Name: _____.

School: _____.

Please rate the following on a scale of 1 to 5 : 1 poor; 2 fair; 3 satisfactory, 4 good, 5 excellent

1. The activities were appropriate for the curriculum. 1 2 3 4 5
2. The language level was suitable for your students. 1 2 3 4 5
3. The tasks were clearly explained and easily understood by the students. 1 2 3 4 5
4. Did you use this activity as part of your evaluation process for students? (Y / N)
5. Did you or will you be visiting the Toronto Zoo with yours students? (Y / N)
6. Would you use these activities again? (Y / N)
7. How would you change the activity to be more useful?
8. Did you use any other Zoo teaching resource material? (Y / N) (What?)
9. Are there any other kinds of resources you would like the Zoo to provide to support your visit?
10. Do you have any other comment?