Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Biology 2 Lab Extra Credit (10 pts)**

**EVIDENCE OF VARIATION, ADAPTATION AND EVOLUTION**

 **AT THE ZOO/AQUARIUM**

In this exercise you will visit the zoo/aquarium and observe one species. You will then answer a number of questions based on your observations. You may find it helpful to bring a clipboard and scratch paper to take your observations. This is partly an exercise in observation skills. To receive credit for this assignment you must staple your ticket stub to the assignment. The assignment will be graded looking for thoroughness of your answers. The points given for this assignment aren’t just given to you for going. This exercise is based on one by William McComas printed in Investigating Evolutionary Biology in the Laboratory by William McComas (Lancaster Press, Lancaster, PA, 1994).

**Part I – Variation Within a Species**

 In biology, genetic variation occurs and can cause phenotypic differences in species. In this part of this assignment, you will observe variation within a non-human species.

1. Choose one species in the zoo/aquarium of interest to you. **There must be at least three individuals of this species in the zoo’s/aquarium’s collection**. More would be better, so long as you are able to distinguish individuals. Write the name of your choice below:

Common name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Scientific Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Study the animals of this species. List **at least 3** physical characteristics which vary between individuals of this same species. (e.g. Hair length – two have long, one has medium length, and one has short hair). A thorough job on this question will make the rest of the assignment easier.

**Part II – Adaptation to the Environment**

In this exercise you will attempt to determine what characteristics of your species make it able to survive in its particular environment.

1. Describe the natural environment of your animal. Be specific. You may need to do a little outside research, but don’t get carried away. **Be sure to reference any material used which is not your own!!!**
2. List characteristics you believe help this organism survive and breed in its environment. Be sure to indicate how you think this characteristic helps (e.g. “because grizzly bears live as far north as Canada and Alaska, they benefit from their thick fur coat in winter months”).
3. List characteristics you believe will make it difficult for this organism to survive and breed in its environment. Be sure to indicate how you think this characteristic makes it difficult (e.g. “the great size of a grizzly bear requires it to eat enormous amounts of food, much more than a smaller animal would”).
4. What has the zoo/aquarium done to enhance the conditions for the animals you have chosen? What could be done to improve the exhibit? (e.g. Grizzly bears live in mountainous areas and the zoo has built a small mountain area for the bear but Grizzlies usually travel distances and the exhibit is fairly small”).

**Part III – Convergent Evolution**

1. Choose another animal from the same environment as yours, with similar characteristics to your animal, but from a different family (remember your taxonomy, this may take a little research) (Ex. Wolverine and grizzly bear)

Write the name of your choice below:

Common name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Scientific Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. List 3 characteristics this species has in common with your species.

3. What selective pressures from the environment that these animals share may have lead to the evolution of similar characteristics? (Ex

**Part IVA – Divergent Evolution**

1. Choose an animal you believe to be closely related to yours (e.g. zebra and horses, lions and tigers). If possible, choose one from a different environment. Write the name of your choice below:

Common name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Scientific Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. List four reasons for believing these species are related (similar characteristics).
2. List four differences from your species.