

AP Biology Summer Assignment

This summer you will prepare a journal that is due on the first day of class in September. It will be worth 2 test grades. The journal must include photographs of actual specimens (no photocopies or downloads from the internet). This journal is supposed to be a record of “field work” that you have done. Many biologists do work in the environment as opposed to being in a lab. Your grade will be based on *thoroughness of explanations, clarity and appropriateness of pictures, creativity, and your reference list*. You do not need to go to every zoo and aquarium in the state to do this project. You may go no further than your yard and still have a good project. You may go on trips with your friends but make sure you all have *substantially different* projects. Any evidence of collaboration will negatively affect your grade. Information that you get from your text or any other source must be paraphrased and not copied.

Your journal should include:

- A. Illustrate a ***hypothetical*** food web by showing **actual photos**. It does not, nor really should be, a “perfect” scenario. It should, however, be realistic. It should represent what you found on your trip. The food web should include producers and consumers and should belong to one biome or aquatic system (aquatic biome). You should have at least 10 organisms (representing a variety of different classes of animals as appropriate) with their interrelationships clearly identified. These will most likely include some combination of primary, secondary, and tertiary consumers. You may even have decomposers. After preparing your food web you should answer the following:
 1. Briefly describe the community to which members of your food web belong.
 2. Explain how net productivity changes with each level in the food web. You may include a diagram if you wish.
 3. Briefly describe the biome in which this community is found. You should have only one biome and not a mix of biomes.
 4. Pick one organism from your food web and describe its ecological niche in at least 5 different ways.
 5. Define a population. Using the organism you chose in #4, describe density-dependent and density-independent factors that can affect population size.
 6. Describe one environmental issue that affects your biome in some significant way. Describe the source of this problem, how it affects the structure or stability of the biome, and how the issue can be resolved or avoided.
 7. Look back at your food web and choose 5 animals (different classes if possible). Look at them carefully and come up with 5 physical characteristics you can use to classify them.

Use your text and/or the following website to get information on cladograms :

<http://ccl.northwestern.edu/simevolution/obonu/cladograms/Open-This-File.swf>

8. Diagram a cladogram of your 5 animals using your characteristics listed in #7.

B Supply a **plant press** of each of the following plants. This means you need to find the plant and take a piece of it that allows identification. Place it in between pieces of newspaper and flatten between two heavy objects for several days. Attach the plant press into your journal.

- a. Division Bryophyta
- b. Division Pterophyta
- c. Division Coniferophyta
- d. Division Anthophyta- include one monocot and one dicot

1. **Describe** each division's defining characteristics.
2. Provide a **diagram** and **description** of the structure and function of **xylem** and **phloem**.
3. **Describe** the effects of the following **plant hormones**: abscisic acid, auxins, cytokinins, gibberellins, ethylene, and "florigen".
4. Diagram and describe the events of the typical plant life cycle- **alternation of generations**.

C. Prepare a **photo portfolio** of the following common vertebrate classes. **You can use downloaded pictures** for this part of the project.

1. Clade Chondrichthyes
2. Clade Osteichthyes
3. Class Amphibia
4. Clade Reptilia- include lizards, snakes, turtle, and *birds*
5. Class Mammalia
 - a. Next to each photo list the grouping's **defining characteristics**.
 - b. Describe **why** the birds are now placed with the reptiles.

D. Animal Behavior-

1. Go to your text and prepare a table that defines the following:

Animal signals/communication

Innate behavior

Imprinting

Associative learning

Cognition/problem solving

Learned behaviors

Altruism

2. Pick an animal you have in your animal portfolio (Part C) and describe how three of the behaviors listed above are seen in the animal you chose. Be specific.

General notes and information: Please include a **reference list with appropriate documentation**. This includes any source you used, whether it was a book or a website. Do not use Wikipedia as a source. As mentioned above, you do not need to go anywhere in particular to do this project. You can start with your backyard or neighborhood. If you go on a family vacation take some photos of the plants and animals that you see. Some students used old family photos. **Be creative**. If you have any questions please email me at: amorrissey@achs.net

Text:

Urry, L (2018). Campbell Biology AP Edition, 11th ed. Boston: Pearson.

