AP Biology Summer Assignment – 2010 *updated 27 May 2010*

Welcome to AP Biology! This summer assignment has been designed with a few goals in mind:

1) Get a head start on content, allowing us to focus on more challenging concepts in class
2) Get you acquainted with plants as living, growing, breathing (respiring actually), responding organisms
3) Get you outside and experiencing biology first hand!

Part One – Internet TOOLS

Google Docs and Gmail will be central to communication and collaboration on assignments in class. Visit the class site at http://www.biophiles.com. Read the article on Google Docs in the classroom. If you haven't already (most of you should have last year!) create a Gmail address and register your username and information on the Google Doc (link available on class website) and complete the other tasks described in that document.

Part Two – Plant Adoption

Q: Why didn't the research scientist do experiments with plants?
A: ?

Your job: Adopt a *Coleus* houseplant and nurture the plant over the summer, get it to grow! Specifically, your goal is to get it to grow as bushy as possible. There will be a prize for the biggest, bushiest *Coleus*. You do not want your plant to bloom. Do some research on the internet as to how you can achieve BUSHY plants without bloomage. Document the growth of your plant with at least one photo per week over the course of the summer.

Challenge: see if you can vegetatively propagate your *Coleus*.

Part Three – Textbook/Powerpoint (you can check out a textbook starting Thursday)

For each chapter (based on Campbell's 8th Ed) (Chapters 51-55):

a) Read the chapter
b) View the corresponding slides from the PowerPoint ("Ecology" posted on Edline) (optional)
c) Check out additional resources that are posted on Edline (optional)
d) Answer the attached questions. **NOTE THAT EACH CHAPTER HAS ITS OWN DUE DATE!** Answers must be typed into a word document and submitted to Turn-it-in.com (class registration info to come…) ***IMPORTANT* if for some reason your summer schedule conflicts with one of the deadlines, you MUST email me by June 15th (paulsonb@siskorea.org) to arrange alternate turn in dates. Early submissions are welcomed. Late assignments may result in you being dropped from the class! You will be tested over Chapter 51-55 the first/second week back. You are responsible for knowing all of the attached vocabulary words and objectives for each chapter but these will not be collected.**

Part Four – Field image collection

Using the vocabulary from Chapters 51-55, choose 20 terms that you will represent with a photograph. You will post the image and a brief explanation of how that image represents the given vocab word to the class blog. Note: it's not necessary to take a picture of that exact structure or word, it's up to you to represent that word (and sufficiently explain your choice). Important: original photos ONLY. To verify the originality, include an object that is identifiable as yours in each picture (i.e. a pen, pocketknife, rubber chicken, whatever!). Conveniently, it also helps provide a reference point in terms of scale. The first 10 items are **due July 15th**. The second 10 items are **due August 1**. More detailed instructions will be available on the class site.

NOTE: Answers to these questions appear essentially chronologically in the text. Answers MAY appear in note form as long as the necessary information is present. This should be used to guide your reading of the chapter. Also take note of the vocab words in bold font for each chapter.

Chapter 51: Animal Behavior – **DUE by 11:55PM July 4th 2010**

Niko Tinbergen, one of the fathers of ethology, the study of animal behavior, summarized the study of behavior with four questions:

1. What stimulus elicits the behavior, and what physiological mechanisms mediate the response?
2. How does the animal's experience during growth and development influence the response?
3. How the does the behavior aid survival and reproduction?
4. What is the behavior's evolutionary history?

For each behavior, define/categorize it and briefly answer the identified questions (#' s correspond to the list above)
Kinesis of a sow bug in response to humidity - #1
Migration of Blackcap warblers (see p. 1131) - #4
Hibernation of a grizzly bear - #1, 3
Fruit fly courtship - #1, 3
Honeybee communication - #1, 3
Parental imprinting in geese - #1, #2
A digger wasp navigating to its nest - #1
Pavlov's dogs salivate at the sound of a bell - #1, #2
A bird avoids eating black and orange butterflies after a distasteful bite of a Monarch - #1, 2, 3
Dietary preferences of coastal vs. inland garter snakes - #1, 2 (see p. 1131)
Northwestern crows feeding on mollusks - #3
Male peacocks ornately decorated feathers - #3, #4
Male kangaroos "boxing" - #3
Belding's ground squirrel alerts neighbors of approaching predators - #3, 4
Adult vervet monkey alarm calling - #2

Chapter 52: Intro to Ecology – **DUE by 11:55PM Sunday, July 11th 2010**

1. What are the major biotic and abiotic factors that are important to organisms in a particular ecosystem?
2. What is climate and what are the major factors that influence it?
3. Lakes and marine ecosystems are generally classified by light penetration, distance from shore, and open water/bottom. How do these zones relate to the distribution of organisms in these ecosystems?
4. For each biome, summarize 1) where it is found 2) abiotic factors and how they are limiting 3)plant/animal adaptations 4) representative food chain

Chapter 53: Population Ecology – **DUE by 11:55PM Sunday, July 18th 2010**

1. Define the different types of survivorship curves and give an example of representative organism (other than ones mentioned in the book). How do these curves reflect different trade-offs in their respective life histories?
2. Describe the differences between exponential growth and logistic growth and describe the traits associated with r and K-selected organisms
3. Identify examples of density independent and dependent variables that affect populations
4. How are age-structure diagrams used to predict population growth trends?
5. How is the global human population changing?

Chapter 54: Community Ecology – **DUE by 11:55PM Sunday, July 25th 2010**

1. Explain how experiments on barnacles (Figure 54.3) demonstrate the concepts of interspecific interactions, competitive exclusion, fundamental niche, realized niche
2. For each type of interspecific interaction, classify the interaction (i.e +/+) and give one or more example of how this type of interaction has influenced evolution of particular adaptations, behaviors, traits, etc.
3. Imagine two communities, A and B. Both communities have the same number of different types of species, yet community A is twice as diverse as B. How is this possible?
4. Would you argue keystone species or dominant species are more important in an ecosystem? Is your viewpoint more consistent with the bottom-up or top-down model of control and why?
5. In 1883, the volcano Krakatau erupted violently, obliterating two-thirds of the 11-kilometer-long island of depositing 30 to 60 meters of red-hot ash. Today, there are now over 400 species of vascular plants, thousands of species of arthropods including 54 species of butterflies, over 30 species of birds, 18 species of land mollusks, 17 species of bats and 9 reptiles. Explain the process of succession as it would likely have occurred between the eruption and now.

Chapter 55: Ecosystems – **DUE by 11:55PM Sunday, August 1st 2010**

1. How do the laws of energy and mass conservation apply to ecosystems?
2. Distinguish between gross and net primary productivity. What factors affect primary productivity in marine ecosystems? Terrestrial?
3. Explain trophic efficiency (sometimes referred to as the 10% rule) in terms of conservation of energy and mass.
4. Review Figure 55.14 and use it to create a table organizing key facts about each of the four nutrient cycles
5. Summarize how the following activities have affected global nutrient cycles: use of agricultural fertilizers, burning of fossil fuels, industrial chemical pollution, increased CO2 emissions, CFC accumulation