**Unit 8: Ecology**

**Unit 10 References: Textbook Ch. 6, Unit 1 at** [http://www.hippocampus.org/Biology?user=ahawley](http://www.hippocampus.org/Biology?user=mhandest)

**Quiz Dates: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Test Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A. Populations**

1. Watch the animation at: <https://www.youtube.com/watch?v=AL7EoWYW3VU>  
 a. Don't worry about calculating growth for now. Simply watch what happens to the graphs.  
 b. Is a population growth model based on exponential growth more or less realistic than a logistic model? Explain your answer.c. Make a concept map that shows the relationship between limiting factors (both density- dependent and density-dependent factors), carrying capacity, abiotic factors, biotic factors.  
 d. Look back over your concept map from c and add examples to it.

2. Watch the animation at: <https://www.youtube.com/watch?v=TZk6vcmLcKw>  
 a. Create a timeline showing how pesticides, like DDT concentrate as they move through the food chain.  
 b. What is the term for this concentration on pesticides?  
 c. Create a timeline showing how human overpopulation could make this problem worse.

3. Most scientists agree that overall, the human population is over Earth's carrying capacity. List and describe at least 4 ways human overpopulation will negatively impact Earth's ecosystems.  
 a.   
 b.   
 c.  
 d.

**B. Relationships and Interdependence**

1. Watch the video at: <https://www.youtube.com/watch?v=-oVavgmveyY> and answer the following:  
 a. What are synonyms for producer, primary consumer, secondary consumer, and tertiary consumer?  
 b. Why do the arrows in a food chain point toward the one doing the eating?  
 c. Why is a pyramid useful for thinking about energy in a food chain?   
 d. What happens if you remove a trophic level?  
 e. Distinguish between food webs and food chains.  
 f. Define Biodiversity in your own words. Why is bodiversity important to ecosystems?  
 g. It's easy to see how a decomposer or a predator depends upon dead things and prey. However, in ecosystems, organisms are *interdependent*, meaning that organisms depend on each other. Describe how a prey species depends on its predator and how all organisms depend on decomposers.

2. Complete the predator/prey graphing activity.

3. Watch the video at: [https://www.youtube.com/watch?v=zSmL2F1t81Q](%20https:/www.youtube.com/watch?v=zSmL2F1t81Q). What are symbiotic relationships?   
Using the notations given, fill in the chart below:

(Happy face=organism benefits, Sad face=Organism is harmed, Straight face=Organism is neither harmed nor benefitted)

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of Symbiosis** | **Organism 1 in the Relatiohsip** | **Organism 2 in the Relationship** | **Example** |
| **Mutualism** |  |  |  |
| **Commensalism** |  |  |  |
| **Parasitism** |  |  |  |

4. Competition is another type of ecological interaction between species.  
 a. Define competition and niche in your own words  
 b. Relate competition to the concept of a niche.  
 c. What kind of faces (from #3) would you use to describe what's happening to the organisms in a competitive relationship? Explain your answer

**C. Cycles and Climate Issues**

1. Using your book or the information from a hippocampus playlist, draw a picture that shows how the greenhouse effect works and answer the following:  
 a. Is the greenhouse effect good, bad or both? Explain your answer.  
 b. Contrast the problems caused by the greenhouse effect with the problem of the destruction of/hole in the ozone layer.

2. Sketch the Carbon and Nitrogen cycles. Be sure to label what's happening at each step in the cycle.

3. When we study Ecology, you often hear the word "balance" used. Cycles are great studies in balance, since they maintain the flow of materials like Carbon and Nitrogen through the ecosystem, keeping them from building up in any one place. For each of the following ecological problems, **define** the problem, **describe** which cycle is involved, how the imbalance was created, and what the impact of the imbalance is:  
 a. global warming  
 b. eutrophication  
 c. ocean acidification

4. How does overpopulation make the problems in #3 worse? Be as detailed in your answer as possible.

**D. Human Impact on the Ecosystem**

1. Each of the issues on the chart below is currently impacting NC. You'll need to do some internet research to help you fill in the chart below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Problem in NC** | **Description of what's happening and its causes** | **Description of impact of the problem on NC** | **Solutions being tried or ideas for solving the problem** |
| Hog Waste Lagoons |  |  |  |
| Invading species (Kudzu) |  |  |  |
| Acid Rain |  |  |  |

2. Besides the ecological issues we've discussed in this exploration sheet so far, what is one other ecological problem that you know of and what's a possible solution to the problem?

3. For all of the ecological problems that we've discussed in this part of the exploration sheet, describe how human overpopulation makes the problem worse.  
 a.  
 b.  
 c.  
 d.