

Earth Systems I/Unit 4 Study Guide

ESIU4SG (Environmental Systems)

Study Objectives

1. Describe the nature of environmental systems.
 - a. What is a system?
 - b. What is a feedback loop?
 - i. Describe a positive feedback loop.
 - ii. Describe a negative feedback loop.
 - c. Describe the difference between an open and closed system and identify an example of each.
2. Define ecosystems and evaluate how living and nonliving parts interact.
 - a. List and describe several characteristics of ecosystems.
 - b. Describe the difference between net and primary productivity.
 - c. Create a table showing how net primary productivity varies between biomes or ecosystems.
3. Compare and contrast how carbon, phosphorus, nitrogen, and water cycle through the environment.
 - a. Describe the carbon cycle and its reservoirs.
 - b. Describe the phosphorous cycle and its reservoirs.
 - c. Describe the nitrogen cycle and its reservoirs.
 - d. Describe the water cycle and its reservoirs.
4. Identify and evaluate the impact humans have had on each of the above biogeochemical cycles.
5. Discuss the value of using a carbon footprint calculator for understanding the carbon cycle and for changing behavior.

Vocabulary

biogeochemical cycles feedback loop negative feedback loop positive feedback loop dynamic equilibrium closed system open system eutrophication lithosphere atmosphere hydrosphere biosphere gross primary production net primary production biomass nitrogen fixation denitrifying bacteria

Assignments

- Read: Chapter 7 (pages 183 - 205)
- Notebook: **10pts**
 - ✓ "Biosphere 2" (page 190, 191) *Observation/Hypothesis/Experiment/Results*
 - ✓ Reading Notes on Study Objectives
 - ✓ Case Study: "The Dead Zone" *Observation/Hypothesis/Experiment/Results*
 - ✓ Crossword
 - ✓ Testing Your Comprehension (ques. 1-8 on page 212)
 - ✓ Seeking Solutions (ques. 3 on page 212)
- Carbon Footprint Activity **10pts**
(<http://www.carbonfootprint.com/index.html>) (<http://www.safeclimate.net/calculator/>)
- Vocabulary Quiz **15pts**
- Test **20pts**

Web Reference: **Earth Systems Understandings** <http://earthsys.ag.ohio-state.edu/framework.html>

Dead Zone: <http://www.smm.org/deadzone/top.html>