**APES Study Guide**

**Unit 2: LIFE ON EARTH (PART I) – INTRODUCTION TO ECOLOGY**

*The second unit of APES is an introduction to ecology - the study of how living organisms interact with one another and with their surroundings.*

**Textbook Reference:**

Chapter 3 – Ecosystems: What Are They and How Do They Work?

Chapter 7 – Climate and Biodiversity

**Outside Reading:**

* Top of the Food Chain (TC Boyle) - <http://goapes.wikispaces.com/file/view/Top+of+the+Food+Chain.pdf>
* Cycling of Matter - <http://cnx.org/content/m16470/latest/>
* Energy Flow Through Ecosystems -<http://www.learner.org/courses/envsci/unit/text.php?unit=4&secNum=3>
* Biogeochemical Cycling - <http://www.learner.org/courses/envsci/unit/text.php?unit=4&secNum=4>
* Atmosphere <http://cnx.org/content/m16687/latest/>
* Terrestrial Biomes <http://www.nature.com/scitable/knowledge/library/terrestrial-biomes-13236757>

**Vocabulary:**

*Directions: Review key vocabulary, words may appear in quizzes and/or tests. You are not required to write the definitions but are encouraged to review them online*

Chapter 3

abiotic

aerobic respiration

anaerobic respiration

atmosphere

autotrophs

biogeochemical cycles

biomass

biosphere

biotic

carbon cycle

carnivores

chemosynthesis

community

consumers

decomposers

detritivores

ecology

ecosystem

fermentation

food chain

food web

greenhouse gases

gross primary productivity (GPP)

herbivores

heterotrophs

hydrologic (water) cycles

hydrosphere

natural greenhouse effect

net primary productivity (NPP)

nitrogen cycle

nutrient (biogeochemical) cycles

omnivores

organisms

photosynthesis

phosphorus cycle

population

primary consumers

producers

pyramid of energy flow

secondary consumers

stratosphere

sulfur cycle

tertiary consumers

trophic level

troposphere

Chapter 7

biomes

climate

greenhouse effect

greenhouse gases

ocean currents

permafrost

rain shadow effect

weather

**Study Guide Questions (SGQ):**

*Directions:**Answer in complete sentences in your composition books. (must be handwritten)*

Chapter 3

1. What are greenhouse gases and why are they important?
2. Describe the flow of energy to and from the earth.
3. What is the natural greenhouse effect and why is it important for life on earth?
4. Distinguish between the living and nonliving components in ecosystems and give two examples of each.
5. Distinguish among producers (autotrophs), consumers (heterotrophs), and decomposers and detritus feeders and give an example of each in an ecosystem.
6. Distinguish among primary consumers (herbivores), secondary consumers (carnivores), tertiary (third-level) consumers, and omnivores, and give an example of each.
7. Distinguish between a food chain and a food web.
8. Explain what happens to energy as it flows through the food chains and food webs.
9. What happens to matter in an ecosystem?
10. Identify and describe one distinguishing characteristic and the primary reservoir of the following cycles: carbon, nitrogen, phosphorus, sulfur and water.
11. Identify and discuss the consequences of human activities that have resulted in major changes to the nitrogen, carbon and phosphorus cycle. For each activity identified, suggest one strategy got lessening the impact of the human activity.
12. Discuss the environmental problems in a small lake associated with insufficient phosphorus within the ecosystem, and with excessive phosphorus within the ecosystem.

Chapter 7

1. Describe how differences in climate lead to formation of tropical, temperate, and polar deserts, grasslands, and forests.
2. Distinguish between weather and climate.
3. Define ocean currents and explain how they, along with global air circulation, support the formation of forests, grasslands, and deserts.
4. What is the greenhouse effect and why is it important to the earth’s life and climate?
5. What is the rain shadow effect and how can it lead to the formation of deserts?
6. Why do cities tend to have more haze and smog, higher temperatures, and lower wind speeds than the surrounding countryside?
7. Describe how climate and vegetation vary with latitude and elevation.
8. Describe how the three major types of deserts differ in their climate and vegetation.
9. How do desert plants and animals survive?
10. Why have many of the world’s temperate grasslands disappeared?
11. What is permafrost?
12. Why is biodiversity so high in tropical rain forests?
13. Why do most soils in tropical rain forests hold few plant nutrients?
14. What important ecological roles do mountains play?
15. Describe how human activities have affected the world’s deserts, grasslands, forests, and mountains.

**Case Studies:**

*Directions: For each of the following reading answer the following:*

1. *What is the author's main idea? Support with two specific examples.*
2. *Summarize the case study in three sentences.*
3. *What ecological lesson can we learn from the case study?*
4. *What is your opinion? Do you agree or disagree?*

Chapter 3

1. Tropical Rainforest Are Disappearing – page 54
2. Satellites, Google Earth, and the Environment – page 76

Chapter 7

1. Different Climates Support Different Life Forms – page 147
2. Staying Alive in the Desert – page 156