APES Unit 2: Study Guide Questions
Life on Earth

Textbook Reference

Miller, *Living In The Environment,* 15th edition: Chapters 3-4

Vocabulary

cycling rate
residence time
limiting factor
macronutrients
micronutrients
carbon cycle (illustrated)
nitrogen cycle (illustrated)
nitrification
nitrogen fixation
denitrification
ammonification
oxygen cycle (illustrated)
phosphorus cycle (illustrated)
hydrologic cycle (illustrated)
ecosystem
biotic
abiotic
biota
photosynthesis
respiration
aerobic
anaerobic
species
food chain
food web
O horizon
A horizon
B horizon
C horizon
phytoplankton
zooplankton
autotroph
heterotroph
producer
primary consumer
secondary consumer
tertiary consumer
herbivore
carnivore
omnivore
detritus
decomposer
trophic level
biological evolution
extinction
mutation
natural selection
habitat
convergent evolution
divergent evolution
biogeography/island biogeography
trophic-level efficiency
biome
ecological niche
biomass
net production
gross production
primary production
secondary production
energy efficiency
trophic-level efficiency
entropy
Isle Royale National Park
chemosynthesis
energy pyramid
generalist species
specialist species
genetic diversity
gene pool
genetic drift
competitive exclusion

Human Impacts

Water Cycle

Study Guide Questions (SGQs)

1. List and describe five biotic and five abiotic components of an ecosystem.
2. Identify and describe one distinguishing characteristic for each of the nutrient cycles. Name the location of the largest reservoir for each. Cycles: carbon, nitrogen, oxygen, phosphorus, sulfur & water.
3. Identify and discuss the consequences of three human activities that have resulted in major changes to the nitrogen cycle. For each activity identified and discussed, suggest one strategy for decreasing the impact of the human activity.
4. Identify and discuss the consequences of three human activities that have resulted in major changes to the phosphorus cycle. For each activity identified and discussed, suggest one strategy for decreasing the impact of the human activity.
5. Differentiate amongst the following: net production, gross production, primary production, secondary production, net primary production, and gross primary production. (Use Internet and other sources to support this answer) Be able to interpret a primary productivity chart like the one on page 67.
6. Make a list of all the food you eat during one day. Draw a food web connecting you with all of your food and, if applicable, connect your food with what you hypothesize it ate.
7. Describe the role of decomposers & detritivores in the cycling of nutrients through an ecosystem. Describe the consequences, to life on Earth, if every decomposer on earth became extinct. Give examples
8. Explain the case study of the Peppered Moths Describe the conditions that lead to the color change of peppered moths in England during the industrial revolution.
9. Explain how each of the following contributes to biological evolution:
   a) mutations
   b) natural selection
   c) geographic isolation
   d) genetic drift
   e) migration
10. Write an argument (a series of statements in support of a central premise) based on sound environmental science, to support humans eating an entirely vegetarian diet. "Humans should eat a vegetarian diet because….."

Use the Diagram Boxes Below to organize information about each of the nutrient cycles. You must include a diagram which indicates how the cycle works, human impacts on the cycles, major natural and man-made sources of the nutrients, and why cycle is important.

Carbon Cycle

Human Impacts, Uses, Importance

Nitrogen Cycle

Human Impacts, Uses, Importance

Phosphorous Cycle

Human Impacts, Uses, Importance

Sulfur Cycle

Human Impacts, Uses, Importance