

## Unit 3 Exam Preview/ Review Sheet

<p><b>The Living World</b></p> <ul style="list-style-type: none"> <li>• Matter, Energy, and Life             <ul style="list-style-type: none"> <li>○ Elements of Life</li> <li>○ Energy for Life</li> <li>○ From Species to Ecosystems</li> <li>○ Material Cycles and Life Processes</li> </ul> </li> <li>• Biological Communities and Species Interactions             <ul style="list-style-type: none"> <li>○ Who Lives Where, and Why</li> <li>○ Species Interactions</li> <li>○ Community Properties</li> <li>○ Communities in Transition</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Read Chapters 3-6. Complete Questions for Review and Questions for Critical Thinking for each chapter.</b></li> <li>• <b>Review STF</b></li> </ul>
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### Key terms:

Ecosystem	GPP	habitat
Photosynthesis	NPP	<i>Ecological diversity</i>
Cellular respiration	<i>Biomass</i>	<i>Genetic diversity</i>
<i>Fermentation</i>	<i>Standing crop</i>	<i>Law of tolerance</i>
Bacteria	Autotrophs	Range of tolerance
Detritivores/ <i>Detritus feeder</i>	Heterotroph	Limiting factor/ limiting nutrient
Scavenger	Chemosynthesis	Optimum range
Decomposer	Producer	Distribution
Nutrients	Consumer (primary, secondary, tertiary, quaternary...)	Dissolved oxygen (DO)
Trophic pyramid	Herbivore	Ecological Disturbance
Trophic level	Omnivore	Ecological resistance
<i>Ecological Efficiency</i>	Carnivore	Ecological resilience
Laws of thermodynamics	Food chain	Restoration ecology
Calorie	Food webs	Intrinsic value

## **Biogeochemical cycles:**

Macronutrients (N, P, K<sup>+</sup>, Ca<sup>+</sup>, Mg, S)

### **Hydrologic Cycle**

Evaporation

Transpiration

*Evapotranspiration*

Condensation

Precipitation

Surface run off

Infiltration

Percolation

Leaching

Aquifer

*Groundwater discharge (spring)*

Water table

### **Carbon Cycle**

Combustion

*Sedimentation*

*Extraction*

CaCO<sub>3</sub>

Photosynthesis

Cellular Respiration

Organic Compounds

Hydrocarbons (VOCs)

Fossil Fuels

Natural greenhouse effect

Global climate change

*Deforestation*

Ocean Acidification

### **Nitrogen Cycle**

Nitrogen gas= N<sub>2</sub>

Ammonia = NH<sub>3</sub>

Ammonium = NH<sub>4</sub><sup>+</sup>

Nitrate= NO<sub>3</sub><sup>-</sup>

Nitrite= NO<sub>2</sub><sup>-</sup>

Nitrous Oxide = N<sub>2</sub>O

Legume nodules

cyanobacteria

Plant Assimilation (NH<sub>4</sub><sup>+</sup> and NO<sub>3</sub><sup>-</sup>)

Nitrogen fixation

Nitrogen fixing bacteria (rhizobium)

Legumes (Beans and peas)

Nitrification

Denitrification

Ammonification/ Decomposition

Fossil fuel

Combustion

NO<sub>x</sub>

Photochemical Smog

Acid Deposition

Organic Molecules: Amino Acid,  
Nucleic Acid- DNA

Fertilizer

Cultural Eutrophication/ Algal bloom

### **Phosphorus Cycle**

Phosphate =PO<sub>4</sub><sup>3-</sup>

Fertilizer

Organic Compounds: ATP, Nucleic acids, Cell/plasma membrane (phospholipid bilayer)

Cultural eutrophication/ Algal bloom

Hypoxic /Dead zone

*Guano*

*detergents*

### **Sulfur Cycle**

Sulfate=  $\text{SO}_4^{2-}$

Sulfur dioxide=  $\text{SO}_2$

Sulfuric Acid=  $\text{H}_2\text{SO}_4$

*Acid deposition*

*Industrial Smog*

*Fossil Fuel*

*Mining/Refining/Smelting*

Organic Compounds: Amino Acid, Nucleic Acid- DNA

### **THINKING QUESTIONS:**

1. Which cycles have to do with fossil fuel combustion?
2. Which cycles are associated with fertilizers? And cultural eutrophication? Can you explain the steps of cultural eutrophication. Why is it associated with "dead zones."
3. What do the laws of thermodynamics have to do with food chains? The shape of the trophic pyramid?
4. What is the chemistry of acid deposition? IN the AIR. IN the SOIL?
5. How does  $\text{CaCO}_3$  (limestone) and its alkalinity factor into the Carbon cycle and the ocean, as well as issues of acid rain on land.
6. What are the effects of acid deposition?