Honors Bio Chapter 13 Study Guide

What is Ecology?

Ecology	Study of the interactions among living things and their surroundings

Research Methods

Observation	Carefully watching something over time
Experimentation	Lab experiments give more control Field experiments more accurate
Modeling	Use of computer/mathematical models to describe nature, create virtual ecosystem

Levels of Organization

Organism	Individual living thing
Population	Group of same species in area
Community	Group of different species
Ecosystem	Includes all organisms plus climate, soil, water, rocks, and other nonliving things
Biome	Major region characterized by different climate and plants

Biotic Factors

Biotic factors	Living things
Abiotic factors	Nonliving things: eg moisture, temperature, wind, sun, soil
Biodiversity	Variety of living things in ecosystem • more biodiversity is better • **land** environment with most diversity: **tropical rainforests** • **aquatic** environment with most diversity: **coral reefs**
Keystone species	Species w/ unusually large effect on ecosystem, causes ripple effect if lost (eg beaver, wolf)

Food Chains

Food chain	Simple sequence linking species by feeding relationships
Food web	Complex network of feeding relationships

Trophic Levels of Food Chain

1. producer	Makes its own food (plants)
2. primary consumer	Eat plants (herbivore)
3. secondary consumer	Eat primary consumer (carnivore)
4. tertiary consumer	Eat secondary consumers

Producers and Consumers

Producer / autotroph	Get energy from nonliving resources (make own food)
Photosynthesis	Converts light energy (sunlight) to chemical energy (carbohydrates)
Chemosynthesis	Using chemicals to make carbs, found in deep-sea thermal vents

Consumer / heterotroph	Energy from eating other living things
Herbivore	Only eats plants
Carnivore	Only eats animals
Omnivore	Eats plants and animals
Detrivore	Eat detritus (dead organic matter)
Decomposer	Break down organic matter and return nutrients to soil (eg fungi, bacteria)

Cycles

Hydrologic	(water) flows from atmosphere to surface, below ground and back
Oxygen	(biochemical) cycle of photosynthesis and cellular respiration
Carbon	Flow of carbon through environment essential for organic compounds
Nitrogen	Conversion of atmospheric nitrogen gas into compounds that living things can utilize **Nitrogen fixing bacteria:** converts gas nitrogen into ammonia (NH_3) **Denitrifying bacteria:** convert nitrogen compounds back to nitrogen gas
Phosphorus	Returns phosphorus to environment (limiting factor for plant growth)

Pyramid

Sunlight	Source of all energy
10% of energy transferred	Much **energy lost** when consumers eat producers in form of **heat and waste**
Biomass Pyramid	Diagram comparing biomass of different trophic levels **Biomass:** Measure of total dry mass of organisms in given area
Energy Pyramid	Diagram that compares energy used by each trophic level
Pyramid of Numbers	Shows numbers of individual organisms (may be inverted)

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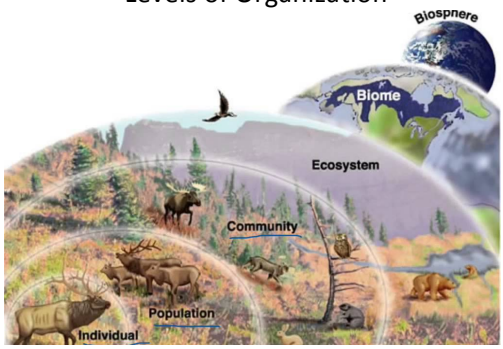
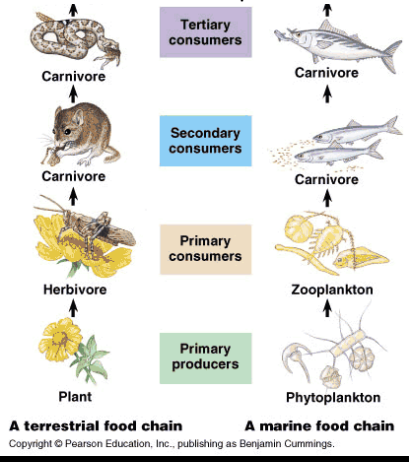
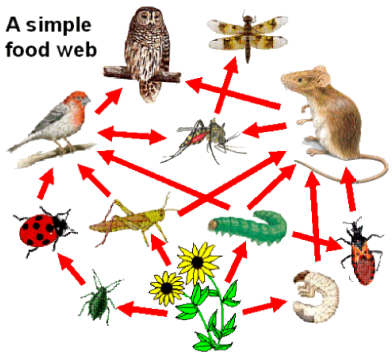
Levels of Organization



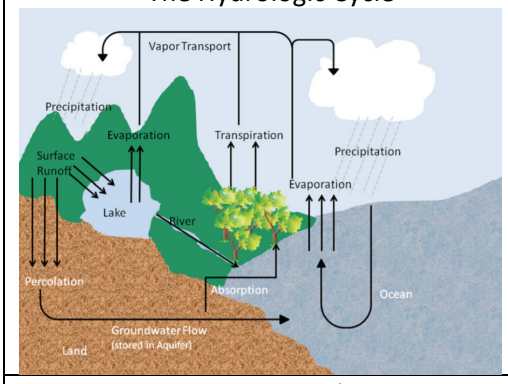
Food Web & Trophic Levels



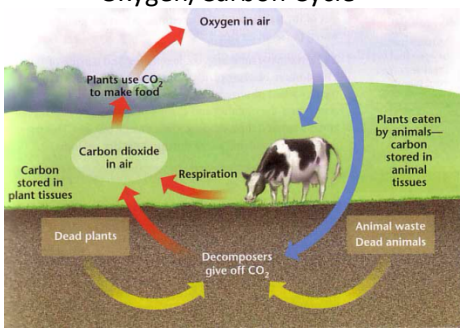
Food Web



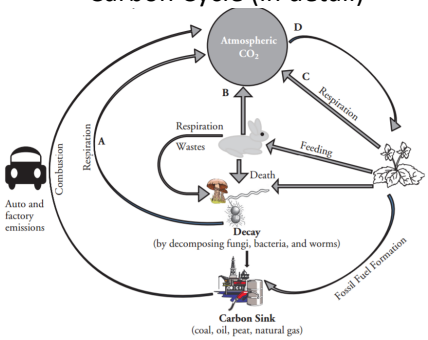
The Hydrologic Cycle



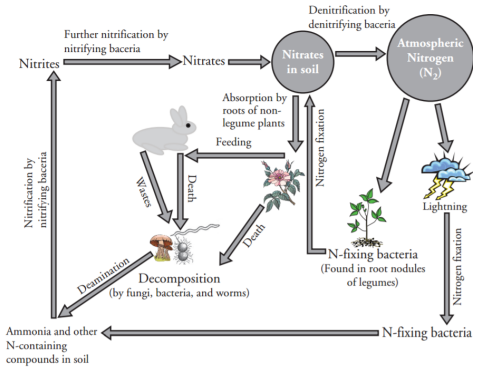
Oxygen/Carbon Cycle



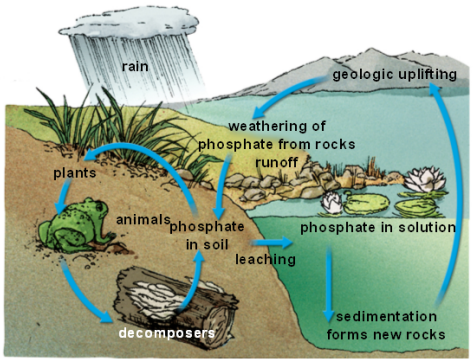
Carbon Cycle (in detail)



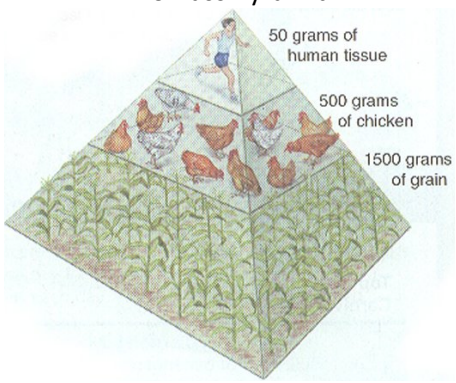
Nitrogen Cycle



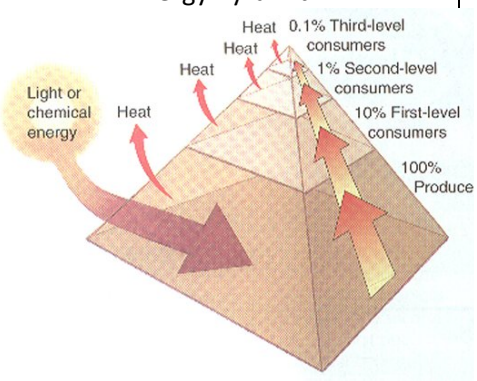
Phosphorus Cycle



Biomass Pyramid



Energy Pyramid



Pyramid of Numbers