

Chapter 2: Principles of Ecology

Section 2.1 – Organisms and Their environment

1. Sharing the World

- a. Organisms get what they need to survive from their _____. There they find food and shelter, reproduce and interact with other organisms.
- b. _____ – the study of plants and animals, including where they grow and live, what they eat, or what eats them.

2. What is Ecology?

- a. _____ is the study of interactions that take place between organisms and their environment.
- b. Ecological research combines many fields and research techniques (including quantitative and qualitative research).

3. The _____

- a. The biosphere is the portion of _____ that supports _____ things.
 - i. Extends from high in the atmosphere to the bottom of the oceans.
- b. _____ factors: _____ environment
 - i. Includes air currents, temperature, moisture, light, and soil.
- c. _____ factors: _____ environment
 - i. Includes other animals living nearby (prey and predators also), group it belongs to, plants, diseases

3 parts:

_____:

earth's solid surface

_____:

water on earth's surface

_____:

air surrounding earth

4. Levels of Organization

- a. Ecology is the study of _____ on several levels:
 - i. _____ – an individual living thing that is made of cells, uses energy, reproduces, responds, grows, and develops
 - ii. _____ – a group of organisms, all of one species, which interbreed and live in the same place at the same time
 - iii. _____ – all the populations of different species that live in the same place at the same time
 - iv. _____ – populations of plants and animals that interact with each other in a given area and with the abiotic components of that area. Can be found on land (_____) or in fresh or salt water (_____)
 - v. _____ - portion of the Earth that supports life
- b. Interactions within _____
 - i. Compete for food, water, mates
- c. Interactions within _____

- i. A change in one population in a community may cause changes in other populations
- d. Biotic and abiotic factors form ecosystems
 - i. Ecosystems include interactions _____ populations and their _____ surroundings

Niche:	
●	Role and position a species has in its environment
●	How, when, and where it gets its food and shelter
●	How it survives
●	How it reproduces
●	Its effects on and interactions with the environment and on other species within the ecosystem

5. Organisms in Ecosystems

- a. _____ – place where an organism lives out its life.
- b. _____ – strategies, adaptations a species uses in its environment
 - i. It is an advantage for a species to occupy a niche different from other species in the same habitat.
 - ii. Unique adaptations and structures are important to a species' niche and important because they reduce competition with other species in the same habitat.

6. Survival Relationships

- a. _____ seek out and eat other organisms. _____ are the animals they eat.
- b. _____ – living together
 - i. _____ – a symbiotic relationship in which _____ species _____
 - 1. Example – ants and acacia trees. Ants protect the tree from other organisms that might want to feed on the tree. The tree provides nectar and a home for the ants.
 - ii. _____ – a symbiotic relationship in which _____ species benefits and the other species is neither _____ nor _____.
 - 1. Example – orchids, ferns, mosses, and other plants sometimes grow on the branches of larger plants. Larger plants aren't harmed, other plants benefit from the habitat
 - iii. _____ – a symbiotic relationship in which a member of one species derives _____ at the _____ on another species (the _____)
 - 1. Example – dogs and fleas. Dogs are the host and fleas feed on their blood.
 - 2. _____ parasitism – Cowbirds lay their eggs in the nests of songbirds. Songbirds end up incubating and feeding the cowbird's babies.

Section 2.2 – Nutrition and Energy Flow

7. How Organisms Obtain Energy

- a. _____
 - i. Organisms that use light energy or energy stored in chemical compounds to make energy-rich compounds. Also called _____
 - ii. Includes plants and algae. These use _____
- b. _____

i. Organisms that cannot make their own food and must feed on other organisms. Also called _____.

ii. Several types:

1. _____ – feeds only on plants.
2. _____ – feeds only on other heterotrophs.
3. _____ – feed on a variety of foods that include animal and plant materials.
4. _____ – eat animals that have already died.
5. _____ – break down the complex compounds of dead and decaying plants and animals into simpler molecules that can be more easily absorbed. Protozoans, many bacteria, and most fungi

8. Flow of Matter and Energy in Ecosystems

- a. _____ – simple model to show how matter and energy move through an ecosystem.
 - i. Uses arrows to indicate the direction in which energy is transferred from one organism to the next. A portion of the energy is given off as heat at each transfer.
- b. _____ – feeding steps in the passage of energy and materials.
 - i. _____ heterotrophs – feeds on plants
 - ii. _____ heterotrophs – feeds on herbivores / first order heterotrophs
 - iii. _____ heterotrophs – feed on second order heterotrophs
- c. _____ – shows all the possible feeding relationships at each trophic level in a community
- d. _____ – can show how energy flows through an ecosystem
 - i. Base represents the first trophic level. Higher trophic levels are layered on top of one another
 - ii. With each step up, only about _____ of the energy is available for the next trophic level.
 1. Energy is neither _____ nor _____.
 - a. Energy is used for the organism's metabolism, for building body tissues, or given off as heat
 - iii. _____ – total weight of living matter at each trophic level

9. Cycles in Nature

- a. Sunlight is constantly replenished. Matter can neither be _____ nor _____. Matter is constantly _____.
- b. _____ cycle (Figure 2.17 on page 53)
 - i. Natural processes constantly recycle water throughout the environment.

1. Evaporation, Transpiration, Respiration, Perspiration, Condensation, Precipitation, Exhalation, Urination, Animals Drinking, Plants Absorbing

c. _____ cycle (Figure 2.18 on page 55)

- i. _____ – energy from the sun is used by autotrophic organisms to convert carbon dioxide gas into energy rich carbon molecules.
- ii. _____ use carbon molecules for _____ and _____
- iii. _____ feed directly or indirectly on the autotrophs and use the carbon molecules for growth and energy
- iv. When autotrophs and heterotrophs use the carbon-containing molecules and release energy, _____ is released and returned to the atmosphere.

d. _____ cycle (Figure 2.19 on page 56)

- i. Nitrogen is converted from a _____ to _____ important for life and back to a _____.
- ii. Certain _____ convert nitrogen gas from the air into more usable forms
- iii. Chemical _____ give plants nitrogen in a form they can use.
- iv. _____ use the nitrogen to make important molecules such as proteins
- v. _____ eat plants and convert the nitrogen containing plant proteins into nitrogen containing animal proteins.
- vi. _____ contains nitrogen compounds and returns the nitrogen to the soil.

e. _____ cycle (Figure 2.20 on page 57)

- i. All organisms require phosphorous for _____ and _____.
- ii. _____ term cycle:
 1. _____ obtain phosphorous from the soil.
 2. _____ obtain phosphorous by eating plants
 3. When animals _____, they decompose and the phosphorous is _____ to the soil to be used again
- iii. _____ term cycle
 1. Phosphates washed into water become _____ into _____ as insoluble compounds
 2. Rock containing phosphorus is _____ and _____, releasing the phosphorous back into the _____