



## Chapter 3 (excluding soil p. 67-70)

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| <b>aerobic respiration</b>              | Complex process that occurs in the cells of most living organisms, in which nutrient organic molecules such as glucose ( $C_6H_{12}O_6$ ) combine with oxygen ( $O_2$ ) and produce carbon dioxide ( $CO_2$ ), water ( $H_2O$ ), and energy.                                                                                                            |
| <b>anaerobic respiration</b>            | Form of cellular respiration in which some decomposers get the energy they need through the breakdown of glucose (or other nutrients) in the absence of oxygen. C                                                                                                                                                                                       |
| <b>bacteria</b>                         | Prokaryotic, one-celled organisms. Some transmit diseases. Most act as decomposers and get the nutrients they need by breaking down complex organic compounds in the tissues of living or dead organisms into simpler inorganic nutrient compounds.                                                                                                     |
| <b>biodiversity</b>                     | Variety of different species (species diversity), genetic variability among individuals within each species (genetic diversity), variety of ecosystems (ecological diversity), and functions such as energy flow and matter cycling needed for the survival of species and biological communities (functional diversity).                               |
| <b>biomass</b>                          | Organic matter produced by plants and other photosynthetic producers; total dry weight of all living organisms that can be supported at each trophic level in a food chain or web; dry weight of all organic matter in plants and animals in an ecosystem; plant materials and animal wastes used as fuel.                                              |
| <b>biome</b>                            | Terrestrial regions inhabited by certain types of life, especially vegetation. Examples are various types of deserts, grasslands, and forests.                                                                                                                                                                                                          |
| <b>calorie</b>                          | Unit of energy; amount of energy needed to raise the temperature of 1 gram of water $1^\circ C$                                                                                                                                                                                                                                                         |
| <b>carnivore</b>                        | Animal that feeds on other animals.                                                                                                                                                                                                                                                                                                                     |
| <b>community</b>                        | Populations of all species living and interacting in an area at a particular time.                                                                                                                                                                                                                                                                      |
| <b>consumer</b>                         | Organism that cannot synthesize the organic nutrients it needs and gets its organic nutrients by feeding on the tissues of producers or of other consumers; generally divided into primary consumers (herbivores), secondary consumers (carnivores), tertiary (higher-level) consumers, omnivores, and detritivores (decomposers and detritus feeders). |
| <b>decomposer</b>                       | Organism that digests parts of dead organisms and cast-off fragments and wastes of living organisms by breaking down the complex organic molecules in those materials into simpler inorganic compounds and then absorbing the soluble nutrients. Decomposers consist of various bacteria and fungi.                                                     |
| <b>detritus feeder</b>                  | Organism that extracts nutrients from fragments of dead organisms and their cast-off parts and organic wastes. Examples are earthworms, termites, and crabs.                                                                                                                                                                                            |
| <b>dissolved oxygen (DO) content</b>    | Amount of oxygen gas ( $O_2$ ) dissolved in a given volume of water at a particular temperature and pressure, often expressed as a concentration in parts of oxygen per million parts of water.                                                                                                                                                         |
| <b>ecological efficiency</b>            | Percentage of energy transferred from one trophic level to another in a food chain or web.                                                                                                                                                                                                                                                              |
| <b>ecology</b>                          | Study of the interactions of living organisms with one another and with their nonliving environment of matter and energy; study of the structure and functions of nature.                                                                                                                                                                               |
| <b>ecosystem</b>                        | Community of different species interacting with one another and with the chemical and physical factors making up its nonliving environment.                                                                                                                                                                                                             |
| <b>food chain</b>                       | Series of organisms in which each eats or decomposes the preceding one.                                                                                                                                                                                                                                                                                 |
| <b>food web</b>                         | Complex network of many interconnected food chains and feeding relationships.                                                                                                                                                                                                                                                                           |
| <b>gross primary productivity (GPP)</b> | The rate at which an ecosystem's producers capture and store a given amount of chemical energy as biomass in a given length of time.                                                                                                                                                                                                                    |
| <b>habitat</b>                          | Place or type of place where an organism or population of organisms lives.                                                                                                                                                                                                                                                                              |
| <b>herbivore</b>                        | Plant-eating organism. Examples are deer, sheep, grasshoppers, and zooplankton.                                                                                                                                                                                                                                                                         |
| <b>limiting factor</b>                  | Single factor that limits the growth, abundance, or distribution of the population of a species in an ecosystem.                                                                                                                                                                                                                                        |
| <b>net primary productivity (NPP)</b>   | Rate at which all the plants in an ecosystem produce net useful chemical energy; equal to the difference between the rate at which the plants in an ecosystem produce useful chemical energy (gross primary productivity) and the rate at which they use some of that energy through cellular respiration.                                              |
| <b>nitrogen fixation</b>                | Conversion of atmospheric nitrogen gas into forms useful to plants by lightning, bacteria, and cyanobacteria; it is part of the nitrogen cycle.                                                                                                                                                                                                         |
| <b>omnivore</b>                         | Animal that can use both plants and other animals as food sources. Examples are pigs, rats, cockroaches, and people. Compare carnivore, herbivore.                                                                                                                                                                                                      |

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| <b>photosynthesis</b>         | Complex process that takes place in cells of green plants. Radiant energy from the sun is used to combine carbon dioxide (CO <sub>2</sub> ) and water (H <sub>2</sub> O) to produce oxygen (O <sub>2</sub> ) and carbohydrates (such as glucose, C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> ) and other nutrient molecules. |
| <b>population</b>             | Group of individual organisms of the same species living in a particular area.                                                                                                                                                                                                                                                 |
| <b>producer</b>               | Organism that uses solar energy (green plant) or chemical energy (some bacteria) to manufacture the organic compounds it needs as nutrients from simple inorganic compounds obtained from its environment.                                                                                                                     |
| <b>pyramid of energy flow</b> | Diagram representing the flow of energy through each trophic level in a food chain or food web. With each energy transfer, only a small part (typically 10%) of the usable energy entering one trophic level is transferred to the organisms at the next trophic level.                                                        |
| <b>scavenger</b>              | Organism that feeds on dead organisms that were killed by other organisms or died naturally. Examples are vultures, flies, and crows.                                                                                                                                                                                          |
| <b>species</b>                | Group of organisms that resemble one another in appearance, behavior, chemical makeup and processes, and genetic structure. Organisms that reproduce sexually are classified as members of the same species only if they can actually or potentially interbreed with one another and produce fertile offspring.                |
| <b>transpiration</b>          | Process in which water is absorbed by the root systems of plants, moves up through the plants, passes through pores (stomata) in their leaves or other parts, and evaporates into the atmosphere as water vapor.                                                                                                               |
| <b>trophic level</b>          | All organisms that are the same number of energy transfers away from the original source of energy (for example, sunlight) that enters an ecosystem. For example, all producers belong to the first trophic level, and all herbivores belong to the second trophic level in a food chain or a food web.                        |

## Chapter 4

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| <b>adaptation</b>            | Any genetically controlled structural, physiological, or behavioral characteristic that helps an organism survive and reproduce under a given set of environmental conditions. It usually results from a beneficial mutation. |
| <b>background extinction</b> | Normal extinction of various species as a result of changes in local environmental conditions.                                                                                                                                |
| <b>domesticated species</b>  | Wild species tamed or genetically altered by crossbreeding for use by humans for food (cattle, sheep, and food crops), pets (dogs and cats), or enjoyment (animals in zoos and plants in gardens).                            |
| <b>ecological niche</b>      | Total way of life or role of a species in an ecosystem. It includes all physical, chemical, and biological conditions a species needs to live and reproduce in an ecosystem.                                                  |
| <b>endemic species</b>       | Species that is found in only one area. Such species are especially vulnerable to extinction.                                                                                                                                 |
| <b>extinction</b>            | Complete disappearance of a species from the earth. This happens when a species cannot adapt and successfully reproduce under new environmental conditions or when it evolves into one or more new species.                   |
| <b>fundamental niche</b>     | The full potential range of the physical, chemical, and biological factors a species can use if there is no competition from other species.                                                                                   |
| <b>generalist species</b>    | Species with a broad ecological niche. They can live in many different places, eat a variety of foods, and tolerate a wide range of environmental conditions. Examples are flies, cockroaches, mice, rats, and human beings.  |
| <b>invertebrates</b>         | Animals that have no backbones.                                                                                                                                                                                               |
| <b>mass extinction</b>       | A catastrophic, widespread, often global event in which major groups of species are wiped out over a short time compared with normal (background) extinctions.                                                                |
| <b>realized niche</b>        | Parts of the fundamental niche of a species that are actually used by that species.                                                                                                                                           |
| <b>specialist species</b>    | Species with a narrow ecological niche. They may be able to live in only one type of habitat, tolerate only a narrow range of climatic and other environmental conditions, or use only one type or a few types of food.       |
| <b>subpopulation</b>         | Individuals of a species that live in a habitat patch.                                                                                                                                                                        |
| <b>vertebrates</b>           | Animals that have backbones.                                                                                                                                                                                                  |
| <b>wild species</b>          | Species found in the natural environment.                                                                                                                                                                                     |