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Compare biotic. | | **aerobic respiration** | Complex process that occurs in the cells of most living organisms, in which nutrient organic molecules such as glucose (C6H12O6) combine with oxygen (O2) and produce carbon dioxide (CO2), water (H2O), and energy. Compare photosynthesis. | | **albedo** | Ability of a surface to reflect light. | | **anaerobic respiration** | 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. Compare aerobic respiration. | | **aquatic** | Pertaining to water. Compare terrestrial. | | **aquatic life zone** | Marine and freshwater portions of the biosphere. Examples include freshwater life zones (such as lakes and streams) and ocean or marine life zones (such as estuaries, coastlines, coral reefs, and the deep ocean). | | **atmosphere** | The whole mass of air surrounding the earth. See stratosphere, troposphere. | | **autotroph** | See producer. | | **bacteria** | 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. | | **biodiversity** | 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). | | **biogeochemical cycle** | Natural processes that recycle nutrients in various chemical forms from the nonliving environment to living organisms and then back to the nonliving environment. Examples are the carbon, oxygen, nitrogen, phosphorus, sulfur, and hydrologic cycles. | | **biological community** | See community. | | **biological diversity** | See biodiversity. | | **biomass** | 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. | | **biome** | Terrestrial regions inhabited by certain types of life, especially vegetation. Examples are various types of deserts, grasslands, and forests. | | **biosphere** | Zone of earth where life is found. It consists of parts of the atmosphere (the troposphere), hydrosphere (mostly surface water and groundwater), and lithosphere (mostly soil and surface rocks and sediments on the bottoms of oceans and other bodies of water) where life is found. Sometimes called the ecosphere. | | **biotic** | Living organisms. Compare abiotic. | | **calorie** | Unit of energy; amount of energy needed to raise the temperature of 1 gram of water 1ºC (unit on Celsius temperature scale). See also kilocalorie. | | **carbon cycle** | Cyclic movement of carbon in different chemical forms from the environment to organisms and then back to the environment. | | **carnivore** | Animal that feeds on other animals. Compare herbivore, omnivore. | | **cell** | Smallest living unit of an organism. Each cell is encased in an outer membrane or wall and contains genetic material (DNA) and other parts to perform its life function. Organisms such as bacteria consist of only one cell, but most of the organisms we are familiar with contain many cells. See eukaryotic cell, prokaryotic cell. | | **chemosynthesis** | Process in which certain organisms (mostly specialized bacteria) extract inorganic compounds from their environment and convert them into organic nutrient compounds without the presence of sunlight. Compare photosynthesis. | | **community** | Populations of all species living and interacting in an area at a particular time. | | **condensation nuclei** | Tiny particles on which droplets of water vapor can collect. | | **consumer** | 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). In economics, one who uses economic goods. | | **decomposer** | 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. Producers return most of these chemicals to the soil and water for reuse. Decomposers consist of various bacteria and fungi. Compare consumer, detritivore, producer. | | **detritivore** | Consumer organism that feeds on detritus, parts of dead organisms, and cast-off fragments and wastes of living organisms. The two principal types are detritus feeders and decomposers. | | **detritus** | Parts of dead organisms and cast-off fragments and wastes of living organisms. | | **detritus feeder** | Organism that extracts nutrients from fragments of dead organisms and their cast-off parts and organic wastes. Examples are earthworms, termites, and crabs. Compare decomposer. | | **dissolved oxygen (DO) content** | Amount of oxygen gas (O2) 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. | | **distribution** | Area over which we can find a species. See range. | | **ecological diversity** | The variety of forests, deserts, grasslands, oceans, streams, lakes, and other biological communities interacting with one another and with their nonliving environment. See biodiversity. Compare functional diversity, genetic diversity, species diversity. | | **ecological efficiency** | Percentage of energy transferred from one trophic level to another in a food chain or web. | | **ecology** | 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. | | **ecosphere** | See biosphere. | | **ecosystem** | Community of different species interacting with one another and with the chemical and physical factors making up its nonliving environment. | | **fermentation** | See anaerobic respiration. | | **food chain** | Series of organisms in which each eats or decomposes the preceding one. Compare food web. | | **food web** | Complex network of many interconnected food chains and feeding relationships. Compare food chain. | | **fossil fuel** | Products of partial or complete decomposition of plants and animals that occur as crude oil, coal, natural gas, or heavy oils as a result of exposure to heat and pressure in the earth's crust over millions of years. See coal, crude oil, natural gas. | | **freshwater life zones** | Aquatic systems where water with a dissolved salt concentration of less than 1% by volume accumulates on or flows through the surfaces of terrestrial biomes. Examples are standing (lentic) bodies of fresh water such as lakes, ponds, and inland wetlands and flowing (lotic) systems such as streams and rivers. Compare biome. | | **functional diversity** | Biological and chemical processes or functions such as energy flow and matter cycling needed for the survival of species and biological communities. See biodiversity, ecological diversity, genetic diversity, species diversity. | | **genetic diversity** | Variability in the genetic makeup among individuals within a single species. See biodiversity. Compare ecological diversity, functional diversity, species diversity. | | **gross primary productivity (GPP)** | 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. Compare net primary productivity. | | **habitat** | Place or type of place where an organism or population of organisms lives. Compare ecological niche. | | **herbivore** | Plant-eating organism. Examples are deer, sheep, grasshoppers, and zooplankton. Compare carnivore, omnivore. | | **heterotroph** | See consumer. | | **HIPPO** | Acronym for habitat destruction and fragmentation, invasive species, population growth, pollution, and overharvesting. | | **humus** | Slightly soluble residue of undigested or partially decomposed organic material in topsoil. This material helps retain water and water-soluble nutrients, which can be taken up by plant roots. | | **hydrologic cycle** | Biogeochemical cycle that collects, purifies, and distributes the earth's fixed supply of water from the environment to living organisms and then back to the environment. | | **hydrosphere** | The earth's liquid water (oceans, lakes, other bodies of surface water, and underground water), frozen water (polar ice caps, floating ice caps, and ice in soil, known as permafrost), and water vapor in the atmosphere. See also hydrologic cycle. | | **infiltration** | Downward movement of water through soil. | | **kilocalorie (kcal)** | Unit of energy equal to 1,000 calories. See calorie. | | **leaching** | Process in which various chemicals in upper layers of soil are dissolved and carried to lower layers and, in some cases, to groundwater. | | **limiting factor** | Single factor that limits the growth, abundance, or distribution of the population of a species in an ecosystem. See limiting factor principle. | | **limiting factor principle** | Too much or too little of any abiotic factor can limit or prevent growth of a population of a species in an ecosystem, even if all other factors are at or near the optimum range of tolerance for the species. | | **lithosphere** | Outer shell of the earth, composed of the crust and the rigid, outermost part of the mantle outside the asthenosphere; material found in earth's plates. See crust, mantle. | | **loams** | Soils containing a mixture of clay, sand, silt, and humus. Good for growing most crops. | | **microorganisms** | Organisms such as bacteria that are so small that they can be seen only by using a microscope. | | **natural greenhouse effect** | Heat buildup in the troposphere because of the presence of certain gases, called greenhouse gases. Without this effect, the earth would be nearly as cold as Mars, and life as we know it could not exist. Compare global warming. | | **net primary productivity (NPP)** | 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. Compare gross primary productivity. | | **nitrogen cycle** | Cyclic movement of nitrogen in different chemical forms from the environment to organisms and then back to the environment. | | **nitrogen fixation** | Conversion of atmospheric nitrogen gas into forms useful to plants by lightning, bacteria, and cyanobacteria; it is part of the nitrogen cycle. | | **nutrient** | Any food or element an organism must take in to live, grow, or reproduce. | | **nutrient cycle** | See biogeochemical cycle. | | **omnivore** | Animal that can use both plants and other animals as food sources. Examples are pigs, rats, cockroaches, and people. Compare carnivore, herbivore. | | **organism** | Any form of life. | | **percolation** | Passage of a liquid through the spaces of a porous material such as soil. | | **permeability** | The degree to which underground rock and soil pores are interconnected and thus a measure of the degree to which water can flow freely from one pore to another. Compare porosity. | | **phosphorus cycle** | Cyclic movement of phosphorus in different chemical forms from the environment to organisms and then back to the environment. | | **photosynthesis** | Complex process that takes place in cells of green plants. Radiant energy from the sun is used to combine carbon dioxide (CO2) and water (H2O) to produce oxygen (O2) and carbohydrates (such as glucose, C6H12O6) and other nutrient molecules. Compare aerobic respiration, chemosynthesis. | | **population** | Group of individual organisms of the same species living in a particular area. | | **porosity** | Percentage of space in rock or soil occupied by voids, whether the voids are isolated or connected. Compare permeability. | | **precipitation** | Water in the form of rain, sleet, hail, and snow that falls from the atmosphere onto the land and bodies of water. | | **primary consumer** | Organism that feeds on all or part of plants (herbivore) or on other producers. Compare detritivore, omnivore, secondary consumer. | | **primary productivity** | See gross primary productivity, net primary productivity. | | **producer** | 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. Compare consumer, decomposer. | | **pyramid of energy flow** | 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. Compare pyramid of biomass, pyramid of numbers. | | **range** | See distribution. | | **range of tolerance** | Range of chemical and physical conditions that must be maintained for populations of a particular species to stay alive and grow, develop, and function normally. See law of tolerance. | | **respiration** | See aerobic respiration. | | **salinity** | Amount of various salts dissolved in a given volume of water. | | **scavenger** | Organism that feeds on dead organisms that were killed by other organisms or died naturally. Examples are vultures, flies, and crows. Compare detritivore. | | **secondary consumer** | Organism that feeds only on primary consumers. Compare detritivore, omnivore, primary consumer. | | **soil** | Complex mixture of inorganic minerals (clay, silt, pebbles, and sand), decaying organic matter, water, air, and living organisms. | | **soil horizons** | Horizontal zones that make up a particular mature soil. Each horizon has a distinct texture and composition that vary with different types of soils. See soil profile. | | **soil permeability** | Rate at which water and air move from upper to lower soil layers. Compare porosity. | | **soil porosity** | See porosity. | | **soil profile** | Cross-sectional view of the horizons in a soil. See soil horizon. | | **soil structure** | How the particles that make up a soil are organized and clumped together. See also soil permeability, soil texture. | | **soil texture** | Relative amounts of the different types and sizes of mineral particles in a sample of soil. | | **species** | 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. | | **species diversity** | Number of different species and their relative abundances in a given area. See biodiversity. Compare ecological diversity, genetic diversity. | | **stratosphere** | Second layer of the atmosphere, extending about 17-48 kilometers (11-30 miles) above the earth's surface. It contains small amounts of gaseous ozone (O3), which filters out about 95% of the incoming harmful ultraviolet (UV) radiation emitted by the sun. Compare troposphere. | | **sulfur cycle** | Cyclic movement of sulfur in different chemical forms from the environment to organisms and then back to the environment. | | **terrestrial** | Pertaining to land. Compare aquatic. | | **tertiary (higher-level) consumers** | Animals that feed on animal-eating animals. They feed at high trophic levels in food chains and webs. Examples are hawks, lions, bass, and sharks. Compare detritivore, primary consumer, secondary consumer. | | **transpiration** | 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. | | **trophic level** | 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. | | **troposphere** | Innermost layer of the atmosphere. It contains about 75% of the mass of earth's air and extends about 17 kilometers (11 miles) above sea level. Compare stratosphere. | | **water cycle** | See hydrologic cycle. | | **weathering** | Physical and chemical processes in which solid rock exposed at earth's surface is changed to separate solid particles and dissolved material, which can then be moved to another place as sediment. See erosion. | | http://www.wadsworth.com/images/spacer_tr.gif | |

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