

AP Biology

Unit 8 - Ecology

From Simple Studies, <https://simplestudies.edublogs.org> & @simplestudiesinc on Instagram

1. Responses to the Environment:

- Allelopathy: where plants produce chemicals that prevent the growth of neighboring plants
- Cross-pollination: pollination of a flower or plant with pollen from another flower or plant.
- Offspring: Product of reproduction, a new organism produced by one or more parents
- Calvin Cycle: light-independent reactions of photosynthesis in which energy from ATP and NADPH is used to build high-energy compounds such as sugar
- Krebs Cycle (Citric Acid Cycle): second stage of cellular respiration, in which pyruvic acid is broken down into carbon dioxide in a series of energy-extracting reactions
- Phototaxis: movement in response to light
- Abiotic: concerns the non-living
- Biotic: concerns the living

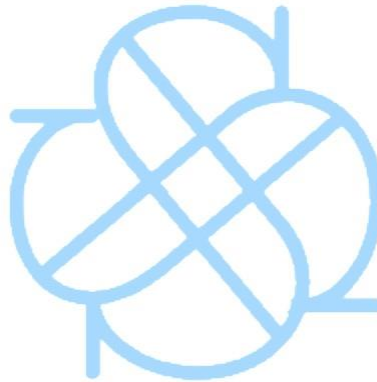
2. Energy Flow Through Ecosystems:

- Producer: organism capable of producing food for itself
- Consumer: organism incapable of producing its own food; must obtain it from producers
- Decomposer: organism that feeds on waste and breaks down dead materials
- Food web: incorporates the multiple food chains and how they relate to one another in an ecosystem
- Food chain: incorporates the linear flow of energy between organisms (prey → predator)
 - Herbivore: an organism that only consumes plant material (primary consumers)
 - Carnivore: an organism that only consumes animal material (meat)
 - Omnivore: an organism that consumes both plant and animal material
- Energy flow: the flow of energy from the Sun to producers to consumers
 - Only about 10% of energy on one level is transferred to the second level of consumers
 - Primary consumer: animals that eat producers
 - Secondary consumer: animals that eat primary consumers
- Other vocab
 - Detritivores: consume dead material.
 - Autotroph: produce their own food from the sun
 - Heterotroph: consume other organisms for food
 - Chemotroph: take in chemicals from other organisms

3. **Population Ecology:**

- Population: organisms part of the same species and live in a specific area
- Age structure: amount of population (expressed in %) that are at a certain age level or part of a certain cohort (can also be divided based on religion)
- Population density: individuals per unit area
- Exponential growth: J-shaped curve: occurs in a population that has unlimited resources
- Carrying capacity: maximum number of individuals that an ecosystem or region can support
 - Acts as the the limiting factor for exponential growth
- Density dependent factor: factor that has a stronger effect depending on how dense the population is (certain population densities will be affected more than others)
- Density independent factor: factor that has the same effect on all population densities
- Limiting factor: Any biotic or abiotic factor that restricts the existence, numbers, reproduction, or distribution of organisms.
- Logistic growth: S-shaped curve; population graphed with consideration to the limiting capacity. This graph takes into account the limiting factors that prevent population growth from going beyond a certain amount.
- K-selected species: type of species that usually live long, and promote the growth and well-being of their offspring (usually large and few). They take advantage of the logistical growth
 - Iteroparity: Where adults reproduce multiple times over the course of a long period of time

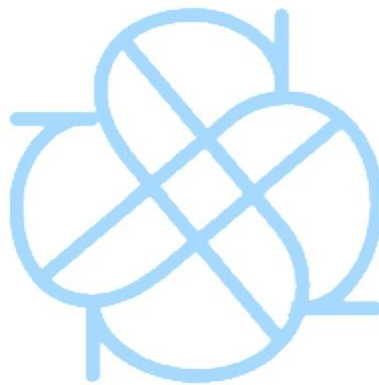
- R-selected species: type of species that have shorter life-spans, and thus maintain the goal of their species survival by producing as many offspring as they can. They do not have the lifespan to nurture offspring, they can only produce as much as they can before they die. They usually take advantage of the exponential growth.
 - Semelparity: where an organism reproduces all in one single event in its lifetime
- Life history pattern: traits related to growth, survival, and reproduction such as age-specific mortality, life span, age at first reproduction, and number of breeding events.
- Survivorship curve: a graph showing the decreasing amount of alive individuals of a single cohort over time



4. **Community Ecology:**

- Community: the multitude of organisms (multiple species) in a single area that interact with each other
- Interspecific Interactions: interactions between 2 or more different types of species (includes competition, predation, herbivory, and symbiosis)
 - Competition: occurs in an environment with limited resources; organisms must compete for access to these resources
 - Symbiosis: relationships that exists between interdependent organisms of different species
 - Mutualism: both species benefit
 - Commensalism: one species benefits, while the other is not affected
 - Parasitism: one species benefits, the other is harmed
 - Parasite: organisms that uses the nutrients of another organism to survive, often harming the other organism (the host)
 - Predation: one organism catches and feeds on the other
 - Interspecific Competition: in a community competition for limited resources between members of different species
- Competitive Exclusion: When two different species compete for a limited amount of resources, it is inevitable that one species will utilize the resources more efficiently, and as a result, have an advantage and will reproduce more. The other species will be eliminated due to their inefficient use of resources.
- Ecological Niche: how the species uses biotic and abiotic aspects of its environment; basically how an organism functions in its environment
 - Fundamental Niche: The full potential range of the abiotic and biotic factors an organism uses in an ideal environment with no competition or limiting factors
 - Realized Niche: the actual potential range of the abiotic and biotic factors that an organism uses; takes into consideration limiting factors and competition
- Keystone Species: a critica species to an ecosystem; affects the living of other organisms

- Invasive Species: organisms that migrate to new locations to which they do not belong. As a result, they often outcompete natives, disrupt food webs, disturb the normal flow of energy and function in an ecosystem
- Primary Succession: an ecological succession that begins in an area where no biotic community previously existed
- Secondary Succession: succession following a disturbance that destroys a community without destroying the soil.



5. **Biodiversity:**

- Biodiversity: variety of living things that can be found in a single ecosystem, region, or the world
- Species: A group of organisms whose members are similar to each other in shape (morphology), physiology, biochemistry and behavior, and can interbreed to produce fertile offspring.
- Habitat: The place where an organism or population lives.
- Community: All living organisms in one habitat at one time
- Population: All organisms of one species in one place and at one time
- Species biodiversity: Differences between different species
- Habitat biodiversity: The range of habitats organisms live in
- Genetic biodiversity: Biodiversity within one species

6. **Disruptions to Ecosystems:**

- Disturbance: event that disturbs a biological community or ecosystem,
 - Can be natural or man-made
 - Nonequilibrium Model: A model that maintains that communities change constantly after being buffeted by disturbances.
 - Immediate Disturbance Hypothesis: more severe disturbance can result in greater diversity
- Ecological Succession: result of disturbance; species composition changes and usually becomes more varied, increasing biodiversity
- Endangered Species: species in danger of being extinct, or eliminated.
- Threatened Species: species that are predicted to be endangered
- Introduced Species: human-brought (intentional or unintentional) species that enter a new area; often referred to as non-native species or exotic species.