

SOL 4.3 -- ADAPTATIONS, ECOSYSTEMS, FOOD CHAINS & NICHES

Key concepts include

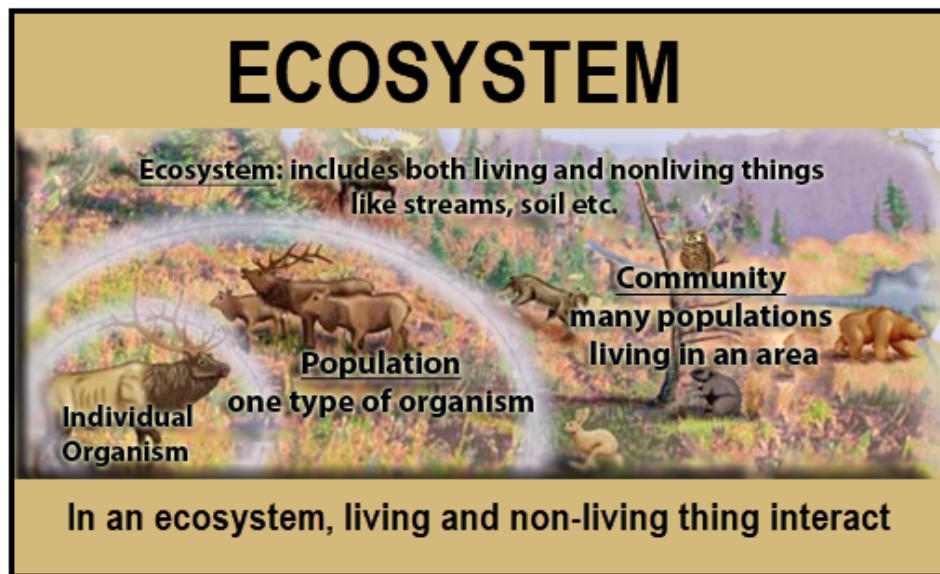
- interrelationships exist in populations, communities, and ecosystems;
- food webs show the flow of energy within an ecosystem;
- changes in an organism's niche and habitat may occur at various stages in its life cycle; and
- classification can be used to identify organisms.



Central Idea: An ecosystem is made up of interacting components that allow for the transfer of matter and energy. Each organism has a specific niche that supports life processes.

POPULATIONS, COMMUNITIES, ECOSYSTEMS

- Ecosystems and their characteristics are the result of complex interactions among Earth's systems.
- An ecosystem is an area where living and nonliving things interact.
- Nonliving factors of an ecosystem include things such as sunlight, water, nutrients, soil, and air.



- All the organisms of the same species that live in the same place at the same time are a population .
 - The populations of species that live in the same place at the same time together make up a community.

ENERGY PYRAMIDS; FOOD CHAINS

The life processes of plants and animals are interdependent and contribute to the flow of energy and cycles of matter within an ecosystem.

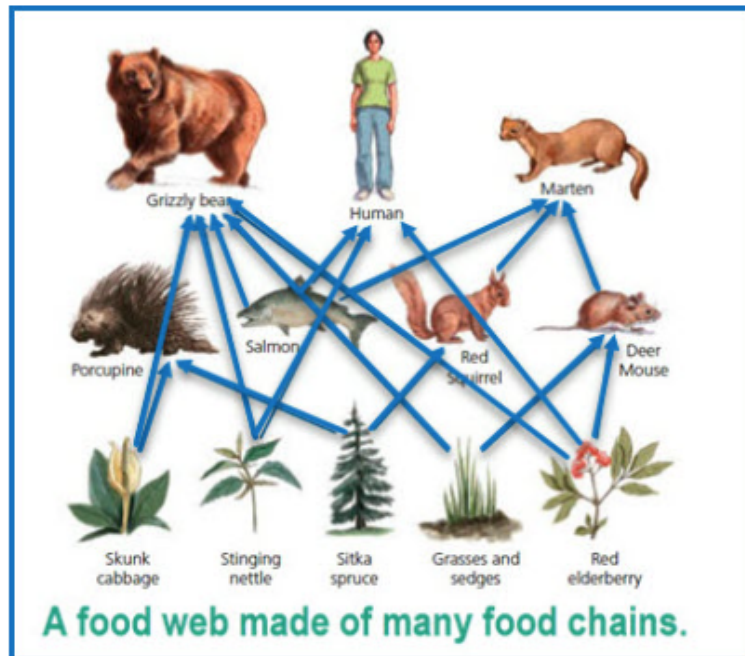
- The interactions and organization within an ecosystem is based on the utilization of the energy from the sun.
- The greatest amount of energy in an ecosystem is in the producers.
- The sun's energy cycles through ecosystems from producers through consumers and back into the nutrient pool through decomposers .



- Within a community, organisms are dependent on the survival of other organisms.
- Energy is passed from one organism to another as modeled in a food chain or food web



- The arrow in a food chain always points to the organism doing the eating.
- These arrows show the flow of energy within the food chain.
- A food web illustrates the interconnected and overlapping food chains in an ecosystem.



HABITATS

- Members of a population interact with other populations in a community.
 - They **compete** to obtain resources, mates, and territory, and they **cooperate** to meet basic needs.
- A **habitat** is the place where an animal or plant naturally lives.
 - An organism's **habitat** provides food, water, shelter, and space.
 - The size of the habitat depends on the organism's needs.

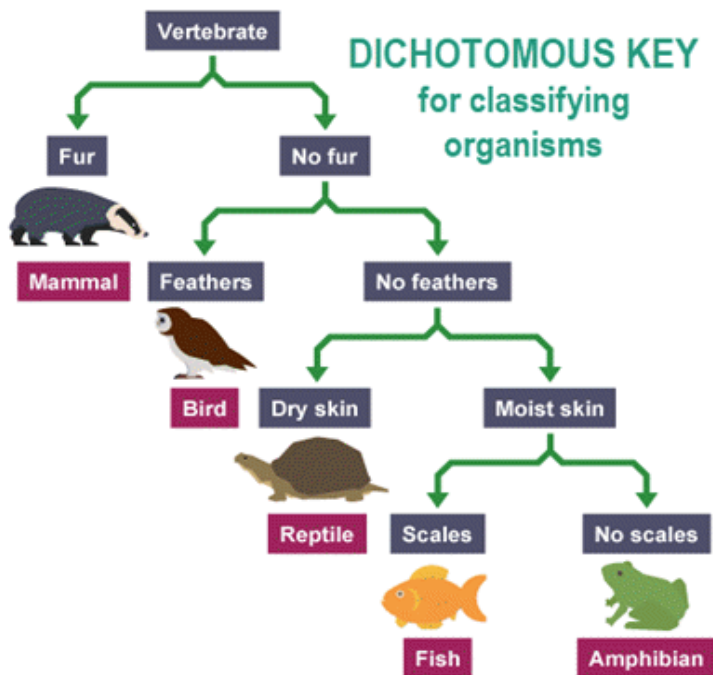
NICHES

- A **niche** is the function or role that an organism performs in the food web of that community.
 - A **niche** also includes everything else the organism **does** and needs in its environment, including what it eats and how it **interacts** with other organisms and the nonliving factors in its environment.
 - Organisms that share the same need for resources must **compete** to meet their needs.



NICHE:
An animal's role in the community - what it eats, and what eats it.

- No two types of organisms occupy the same niche in a community.
- During its life cycle, an organism's role in the community (niche) may change.
- What an animal eats, what eats it, and other relationships may change.
 - For example, tadpoles live in water, breathe through gills, and generally are herbivores. However, adult frogs live primarily on land, breathe with lungs, and are carnivores



CLASSIFICATION

- Noticing patterns is a key step to formulating scientific questions.
- Classification relies on careful observation of patterns, similarities, and differences.
- Classification is useful in explaining relationships by organizing objects or processes into groups.
- Organisms can be organized into groups to help understand similarities and differences.
- A dichotomous key is a tool used to classify organisms based on physical characteristics.