

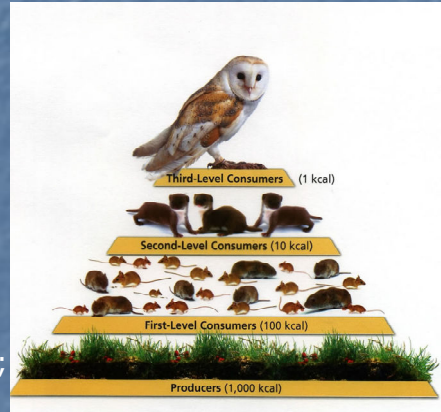
Earth Science

Chapter 10 Ecosystems

Section 1 – Living Things & the Environment

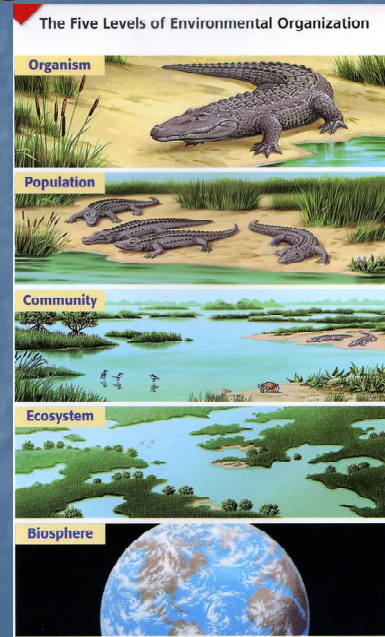
■ Habitats

- **Organism** – a living thing:
 - Plants, animals, fungi, etc.
- **Habitat** – an area that provides the things an organism needs to survive:
 - Food, water & shelter
- **Biotic** Factors
 - ("bio" Latin for life)
 - Living parts of an environment
 - Plants, food, other animals
- **Abiotic** Factors
 - "a" Latin prefix meaning "without";
 - "bio" Latin for life



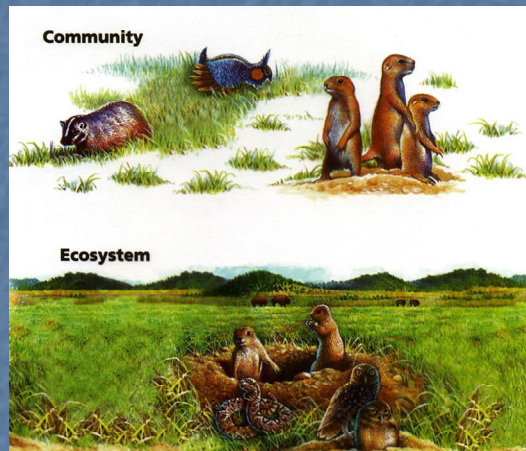
Levels of Life's Organization:

- Cell → Tissue → Organ → Organ System → Organism
- Organism → Species → Population → Community → Ecosystem → Biosphere
- **Species** – physically similar critters that can produce fertile offspring
- **Population** – all the members of the same species in a given area



Levels of Life's Organization:

- **Community** - All the different populations in a given area that are able to INTERACT
- **Ecosystem** – The Community of organisms that live in an area ALONG with the abiotic factors of an area.



Section 2 - Populations

Changes in population sizes:

- **Birth Rate & Death Rate**

- If birth rate > death rate
 - Population increases
- If death rate > birth rate
 - Population decreases

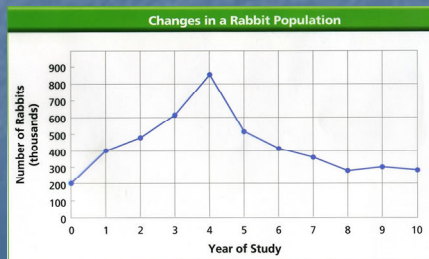
- **Immigration vs Emigration**

- **Immigration**

- Individuals moving into a population

- **Emigration**

- Individuals moving out of a population

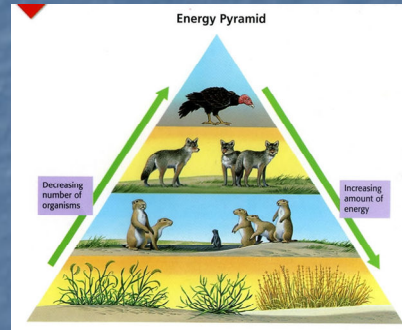


Limiting Factor – an environmental condition that causes population to stop growing: space, food, shelter, water, etc

Carrying Capacity – largest population an area can support

Section 3 – Energy Flow in Ecosystems

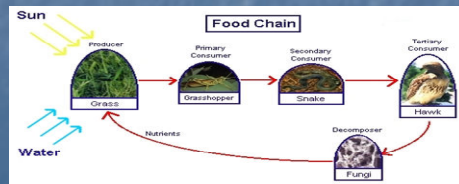
- **Producer** – make their own food; autotrophs – plants
- **Consumers** – classified by what they eat
 - **Herbivores** – eat plants
 - **Carnivores** – eat other animals
 - **Insectivores** eat insects
 - **Picevore** eat fish
 - **Omnivores** – eats both plants & animals
 - **Scavengers** – eat dead organisms
- **Decomposer** - organisms that breakdown wastes & dead tissue









Food Chain: Series of events where one organism eats another to obtain energy

- Producers – plants always start a food chain
- Primary consumers – herbivores that eat the plants
- Secondary consumers
- Tertiary consumers
- Top of the food chain
- Decomposers

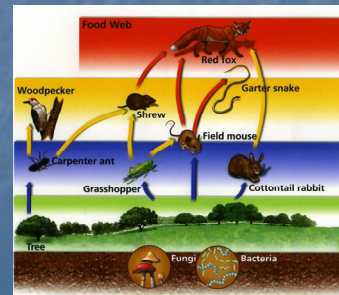
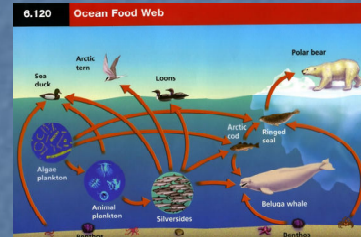
Grass → grasshopper → field mouse → snake → hawk



Trophic level	
Functional role	Food chain
1. Producers	Perennial plants 
2. Primary consumers	Moth 
3. Secondary consumers	Frog 
4. Tertiary consumers	Snake 
5. Quaternary consumer (ultimate carnivore)	Hawk 
6. Decomposers	Bacteria and fungi 

Food Web – many overlapping food chains

- Organisms play multiple roles & levels in a web
- Many food chains that overlap make up a food web
- Food webs often overlap
 - Sea gull is part of a land food web but then flies over the ocean and eats from a school of anchovies



Energy Pyramids –

a diagram that shows the amount of energy transferred from one feeding level to the next.

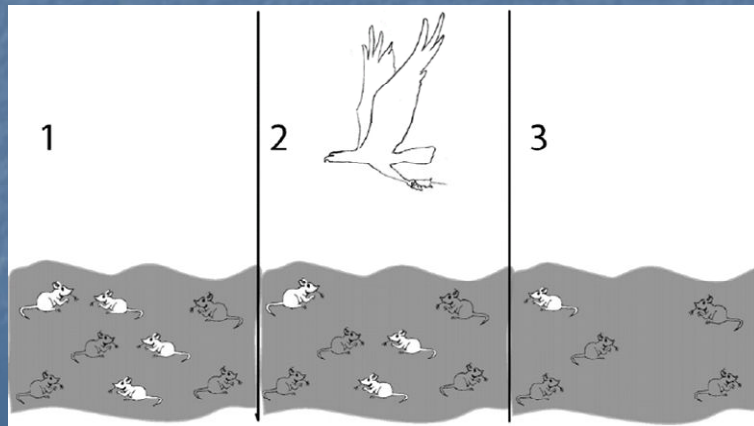
- The most energy is available at the producer level.
- **Primary consumer** – eats plants and uses most of the “food” as energy to live, grow and reproduce.
- When it is eaten by secondary consumer only a small amount of energy from the plant is available to the next level of consumer.
- **10% of the energy** of one level is available to the next level on the pyramid.



Section 4 – Interactions Among Living Things

- Adapting to the Environment:

- **Natural Selection** — process where changes that make organisms better suited to their environment become more common in that species.
- Results of natural selection are adaptations that allow the organism to live and reproduce successfully.



Niche –

how an organism “makes a living” in its environment.

- No two different species “occupies” the same niche.
- Includes: type of food it eats, how it gets its food, when it is active, where it lives, how it reproduces, the conditions it requires to live, etc. etc.

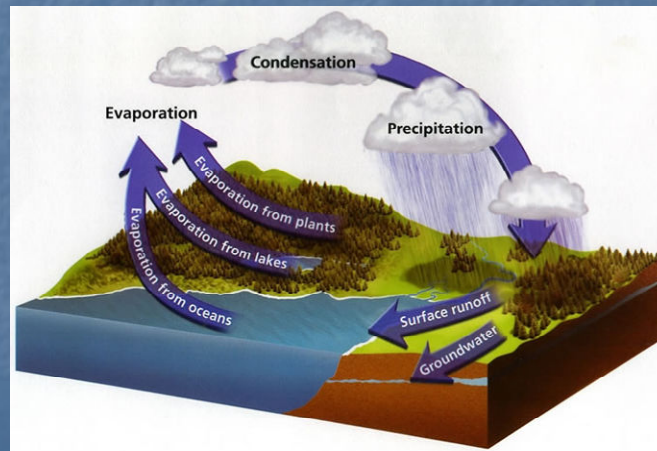


Interacting Organisms

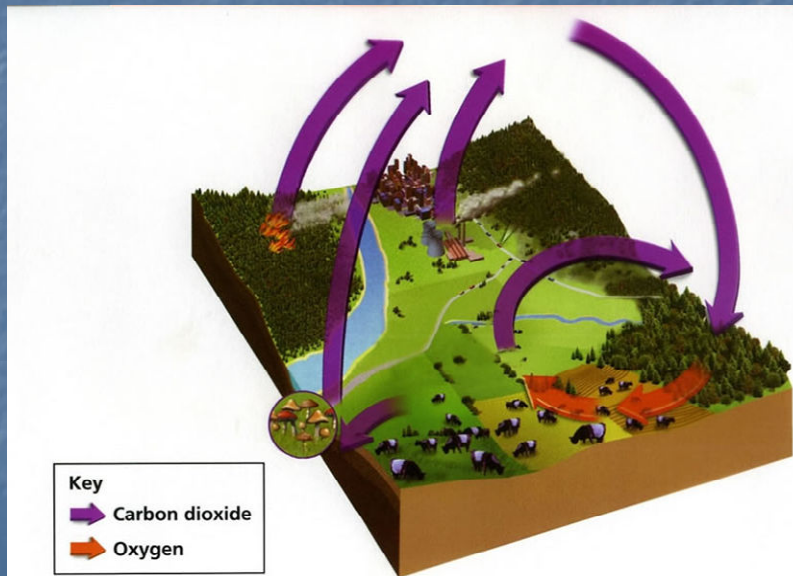
- **Competition** - struggle between organisms to survive as they attempt to use the same limited resources
- **Predation** - Interaction where one organism kills and eats another organism
- **Symbiosis** - a close relationship between two organisms in which at least one of the benefits
- 3 Types of Symbiosis:
 - **Mutualism** - both benefit
 - **Commensalism** - one benefit the other neither helped or harmed
 - **Parasitism** - one benefits, the other harmed
 - One that benefits - **parasite**
 - One that is harmed - **host**

Section 5 – Cycles of Matter

- The **Water Cycle** – Evaporation → Condensation → Precipitation



Carbon Cycle & Oxygen Cycle are interconnected



Nitrogen Cycle

- Nitrogen moves from air to the soil, to plants, to consumers, decomposers and back to the air or soil.
- Most plants can't use atmospheric nitrogen
- **Nitrogen Fixation** - Plants called legumes (beans, peas, clover, alfalfa & peanuts) convert atmospheric nitrogen into usable nitrates and nitrites



Secondary Succession

- the series of changes that occur where the ecosystem has been disturbed but where soil and some organisms still exist.

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