

Ecology Introduction

Ecology is the study of the interactions between organisms and their surrounding environment

The Environment has 2 Dimensions

- #1 Abiotic components: physical characteristics
 - ▶ Temperature
 - ▶ Atmosphere
 - ▶ Water
 - ▶ Climate
 - ▶ Sunlight
 - ▶ Soil Type
 - ▶ Rocks
 - ▶ Chemical characteristics
 - ▶

#2 Biotic Components

Living organisms can be assigned
to five major **KINGDOMS**:

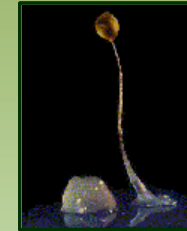
Plants: producers

Animals: consumers (herbivores or carnivores)

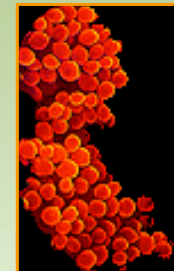
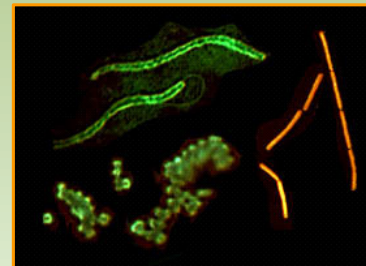
Fungi: decomposers
(detritivores)



Protista: producers or
consumers



Monera (bacteria): producers or
consumers



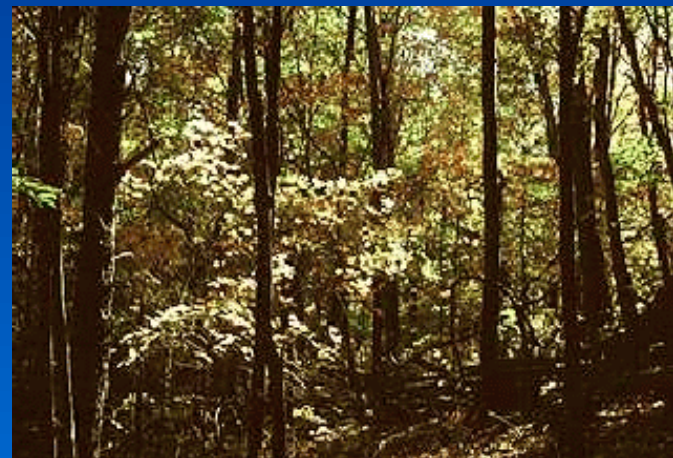
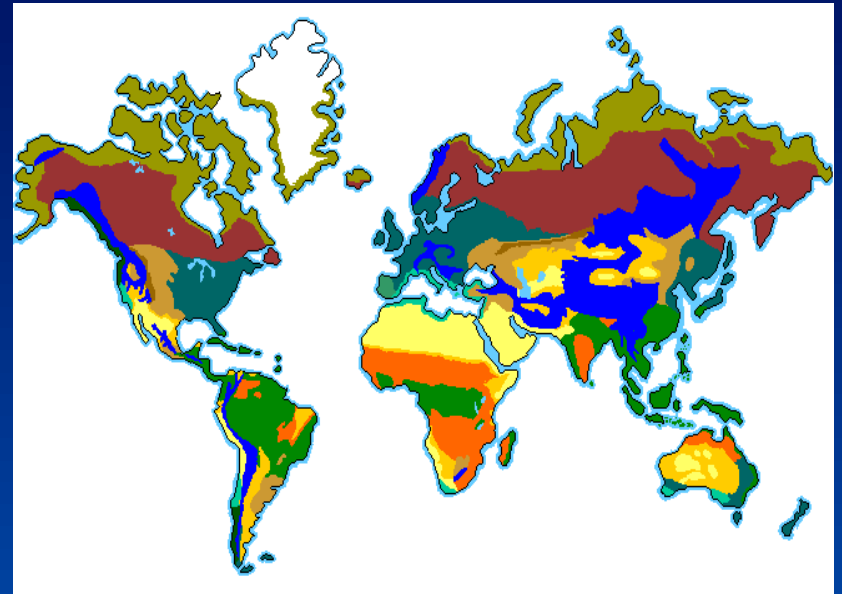
Biosphere

- The region on earth where life exists
- Lithosphere: earth/soil
- Hydrosphere
Water/oceans/lakes/rivers:
- Air: Atmosphere

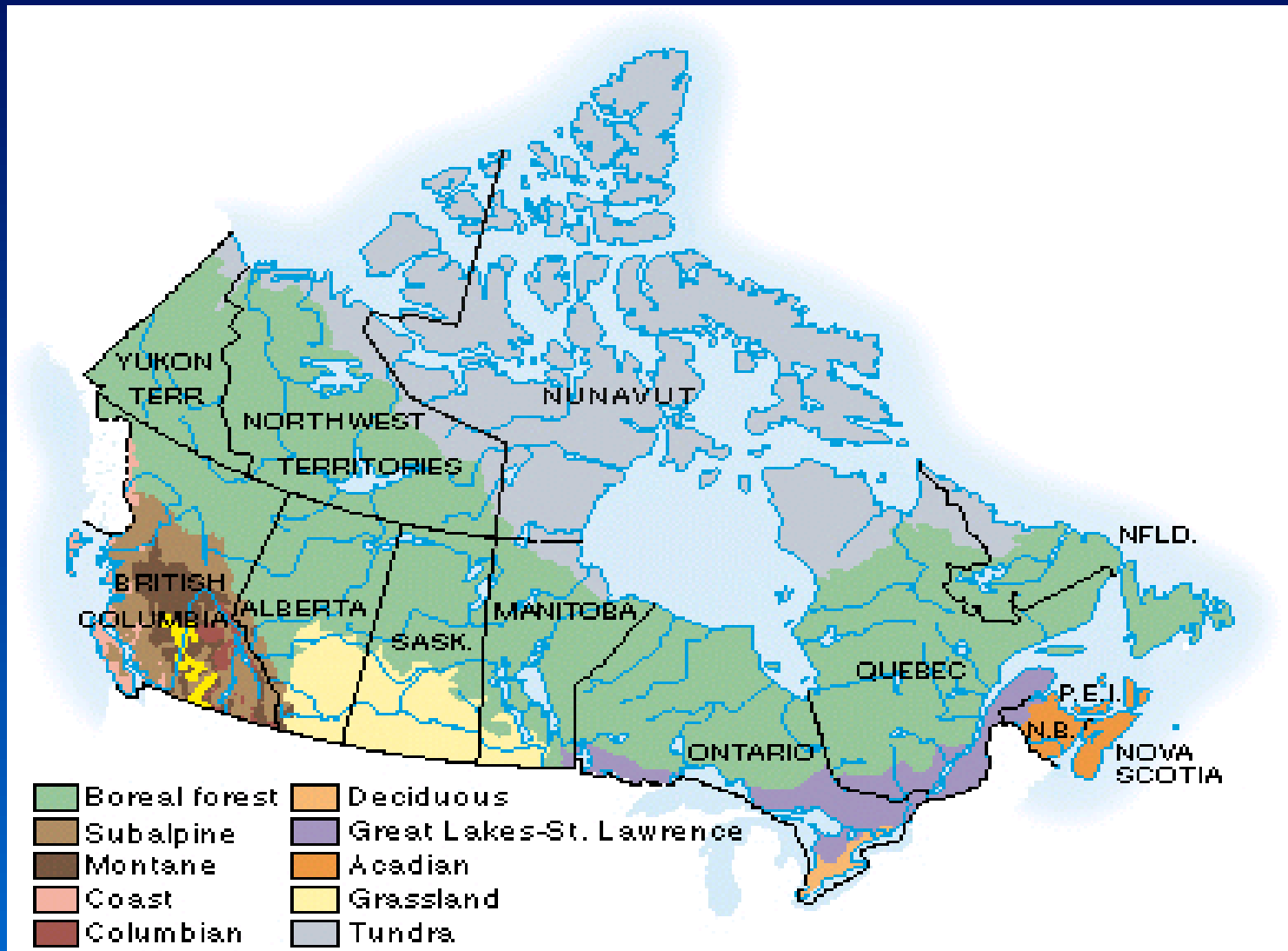


Biome

- A large geographical region with a characteristic climate and distinct set of plants and animals



Can you name the forest regions or Biomes in Ontario?



Ecosystem

- An distinctive area with a self sustaining community and characteristic physical environment
 - ▶ Pond
 - ▶ River
 - ▶ Forest
 - ▶ Grassy field
 - ▶ Swamp

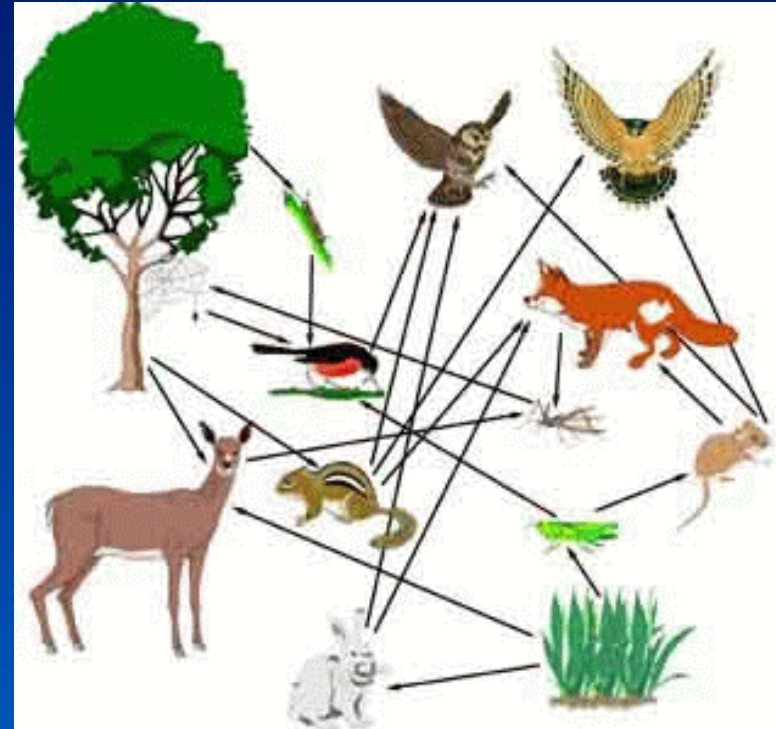
An ecosystem provides an organism with its basic requirements for Habitat

- Water, Food, Shelter, Space
- Describe the habitat of the following organism.



Community

- All the living things in a specific area
- An organism's role within the community or ecosystem is its Niche



Population

- A group of individuals of the same species living in a specific area
- Eg. Snow geese

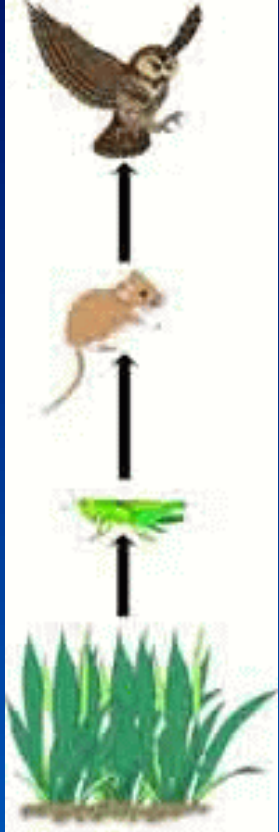


Types of Organisms

- Autotrophs: Produce their own food directly from the sun
- Heterotroph: Consume other plants and or animals for energy

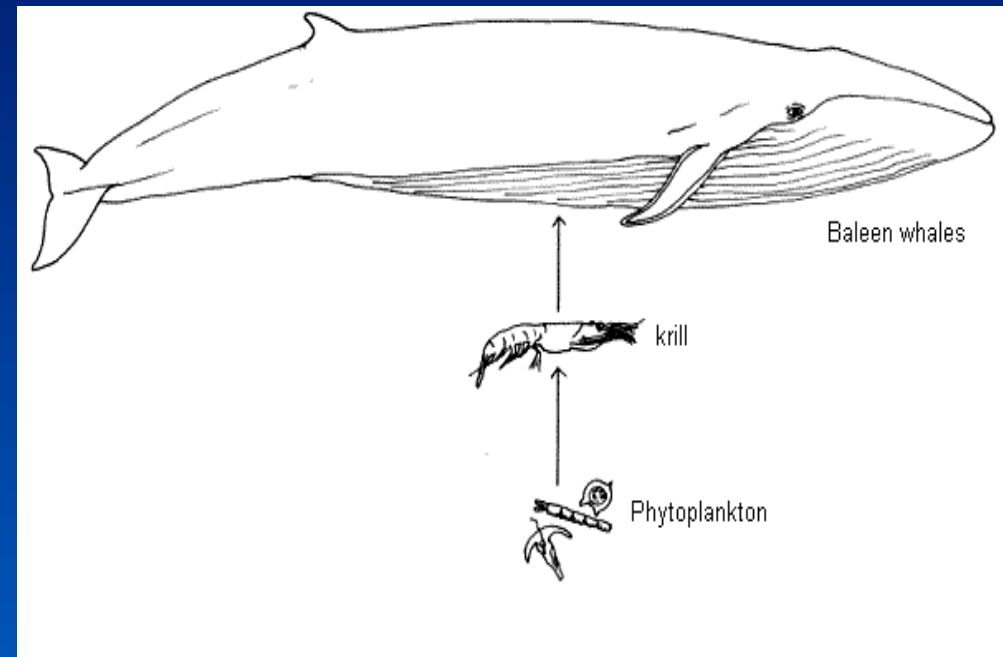
Food Chains

Terrestrial (land) Community



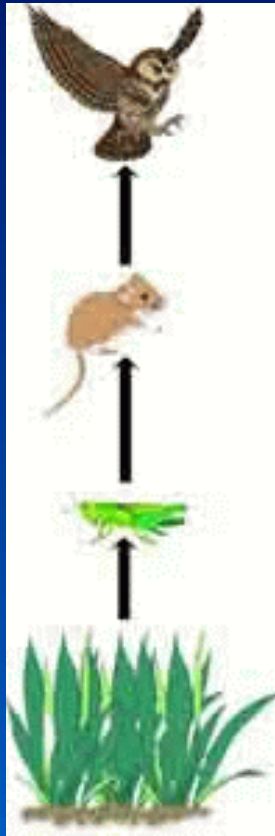
- Top Carnivore
- Carnivore/
2° consumer
- Herbivore/
1° consumer
- Producer / autotroph/
plant/algae

Aquatic (water) Community

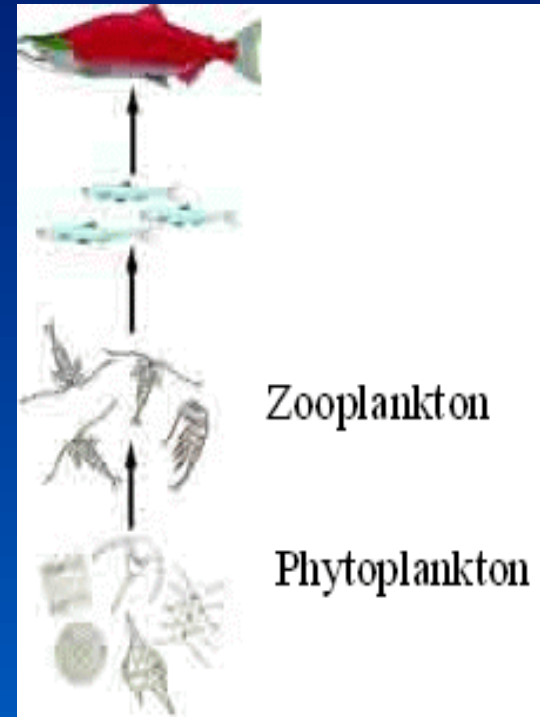


*Note: the direction of the arrows illustrates the flow of energy

Trophic Levels



- Quaternary-eat carnivores
- Tertiary-eat herbivores
- Secondary- eat producers
- Primary



Predators & Prey

- Predators actively hunt their food
- Prey are the hunted



Other Interactions

Turkey Vulture
consume dead
organisms



Scavengers

Bacteria



Decomposer
Detritivore

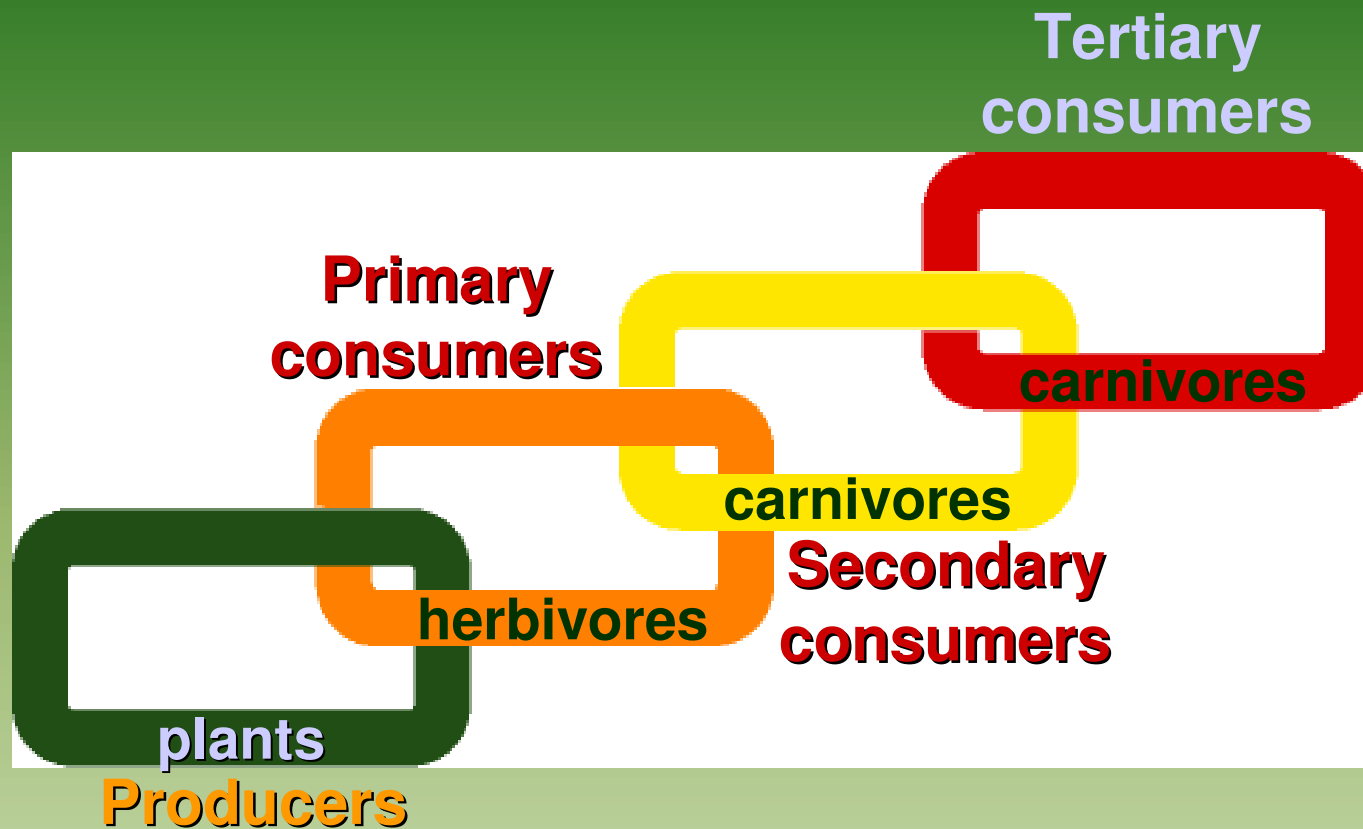
Bracket Fungus: absorbs nutrients by
breaking down organic matter



Parasites

■ <http://martin.parasitology.mcgill.ca/JIMSPAGE/malaria3.html>

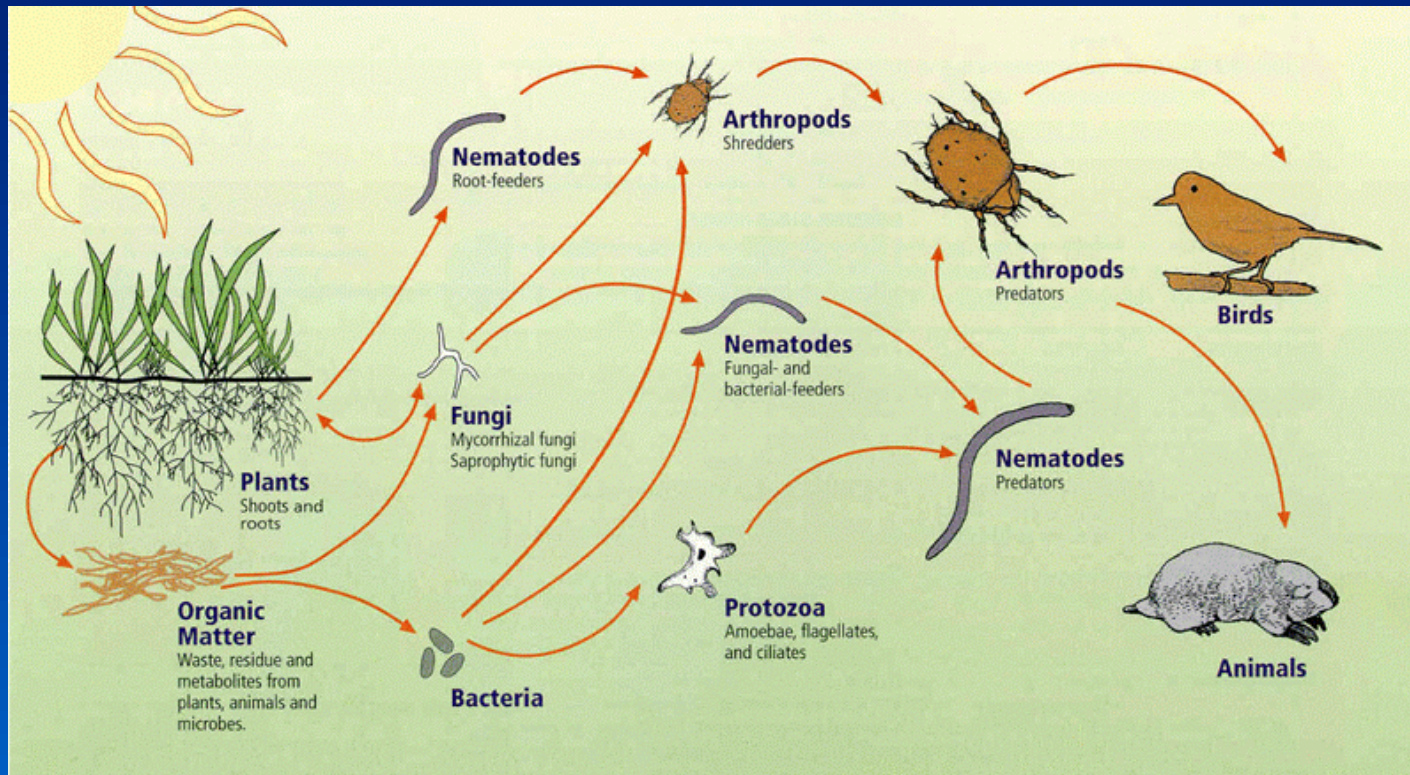
FOOD CHAINS



But in real ecosystems, who eats who is **MUCH** more complicated...instead of food chains, ecologists usually talk about **FOOD WEBS**

Food Webs

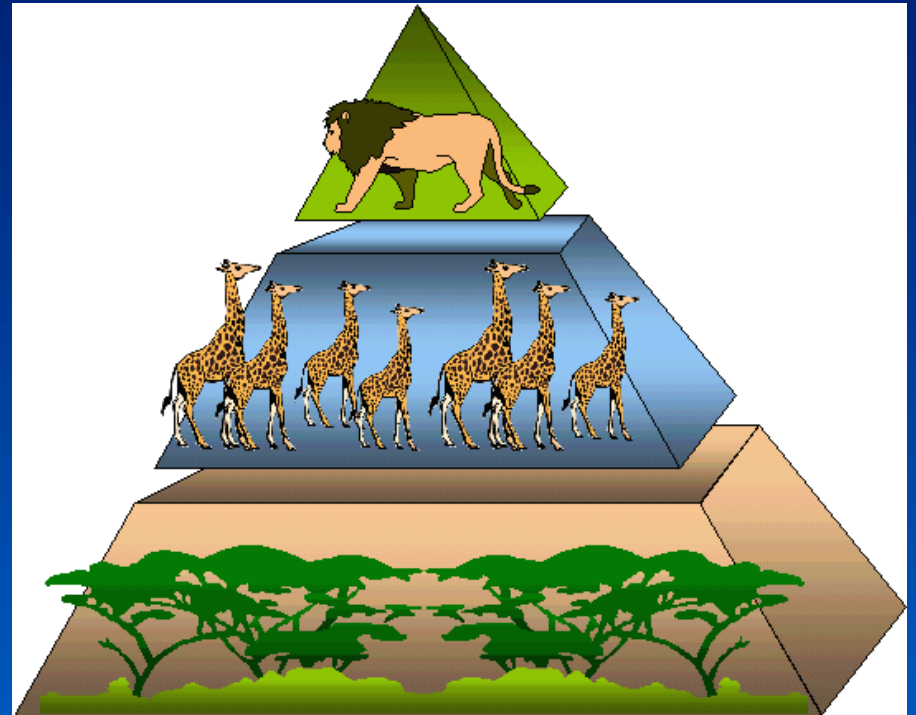
Illustrates all the trophic relationships in the community



Pyramids

As you go up the food chain....

- Numbers of organisms decrease
- Biomass (weight of living organisms) decreases
- Energy decreases



Pyramid of Numbers



Owl:
top predator (carnivore)



Weasels:
secondary
consumers (carnivores)



Mice:
primary (herbivores)
consumers



Plants:
producers