

Ecology

Biotic vs. Abiotic

Abiotic Factors: non-living physical and chemical factors which affect the ability of organisms to survive and reproduce.

Some Abiotic Factors
<ul style="list-style-type: none">• light intensity• temperature range• type of soil or rock• pH level (acidity or alkalinity)• water availability• dissolved gases• level of pollutant

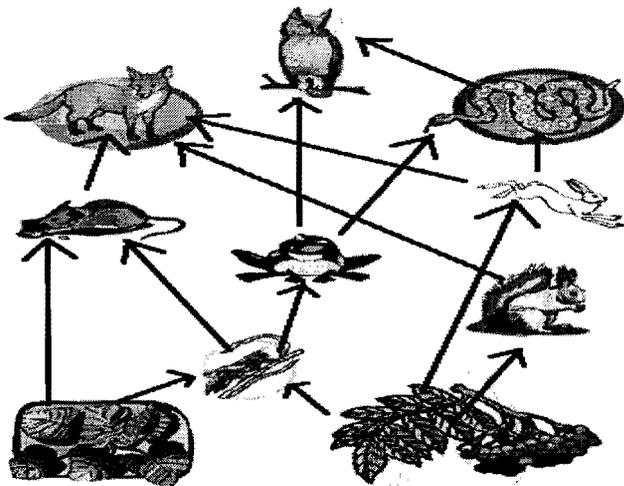
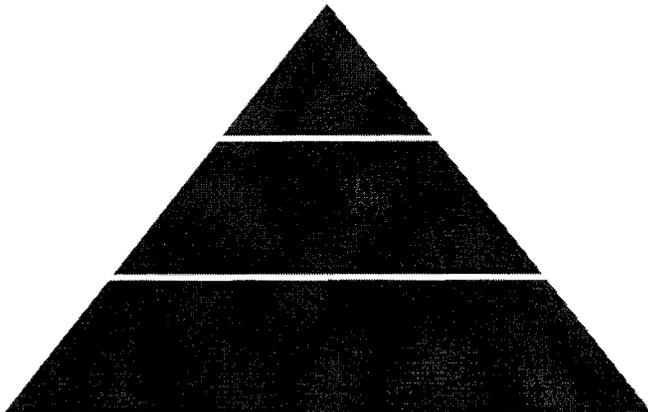
Biotic Factors: living things or their materials that directly or indirectly affect an organism in its environment. This would include organisms, their presence, parts, interaction, and wastes.

Some Biotic Factors
<ul style="list-style-type: none">• parasitism• disease• predation

Feeding Relationships:

<u>Heterotrophic Organisms</u> Consumers	<u>Autotrophic Organisms</u> Producers
Herbivore: Carnivore: Omnivore:	

Food Chain/Food Web/Energy Pyramid:



Feeding Relationships:

1. **Producer-Consumer:**

2. **Predator-Prey:**

3. **Scavengers:**

Symbiotic Relationships: (Close living associations)

Types of Symbiosis
<ul style="list-style-type: none">• parasitism: the parasite benefits at the expense of the host• mutualism: both organisms benefit from the association• commensalism: one organism is benefited and the other is unharmed

Decomposer: organisms use the energy of dead organisms for food and break them down into materials which can be recycled for use by other organisms

ex) Bacteria of decay and many fungi

ECOLOGY

the study of the interactions between organisms and their interrelationships with the physical environment

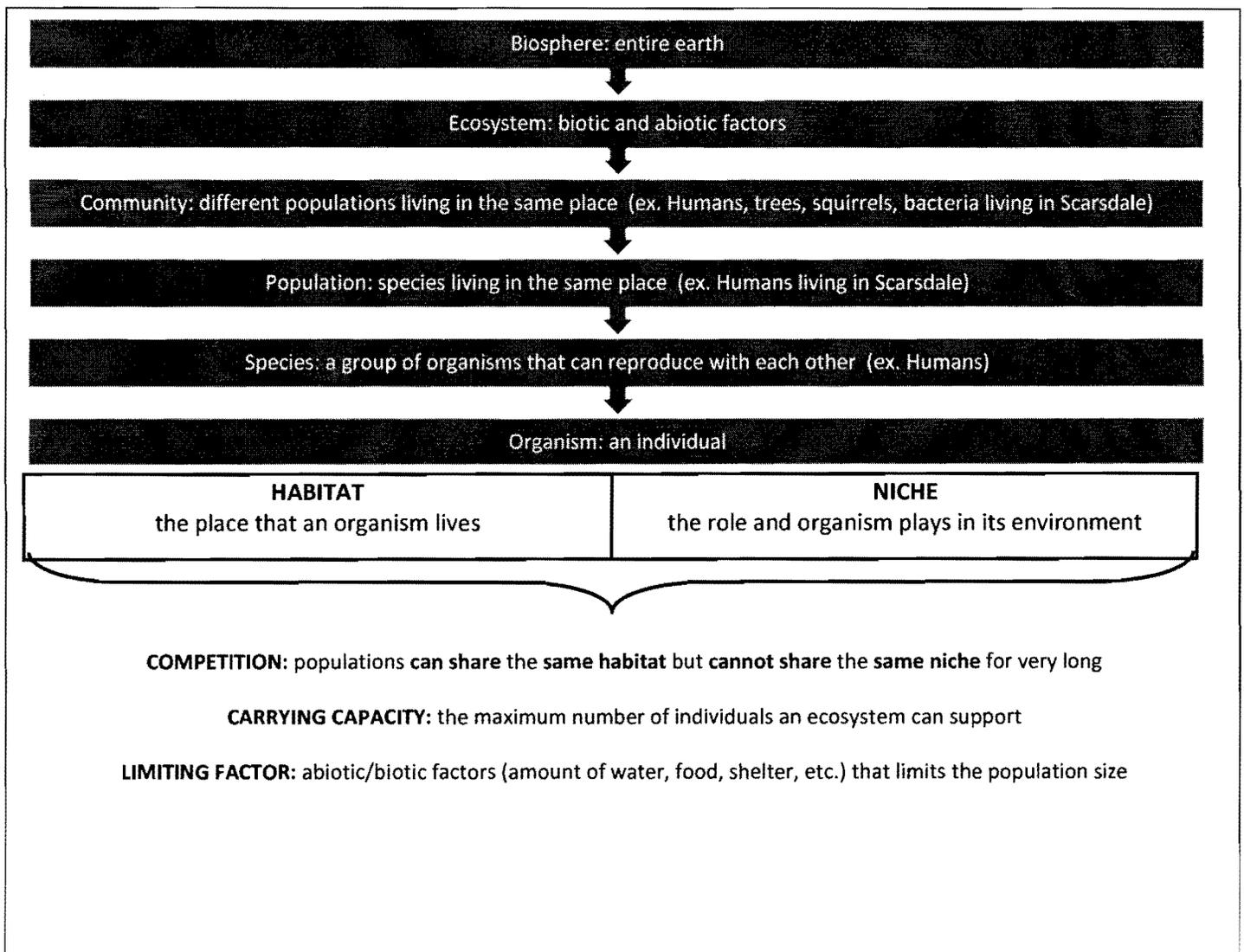
Abiotic and Biotic Factors

Abiotic Factors: non-living physical and chemical factors

<ul style="list-style-type: none">• light intensity• temperature range• type of soil or rock• pH level	<ul style="list-style-type: none">• water availability• dissolved gases• level of pollutant
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Biotic Factors: living things or their materials

<ul style="list-style-type: none">• organisms• organisms parts• organisms wastes	<ul style="list-style-type: none">• parasitism• disease• predation
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Feeding Relationships:

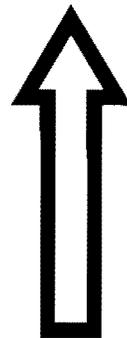
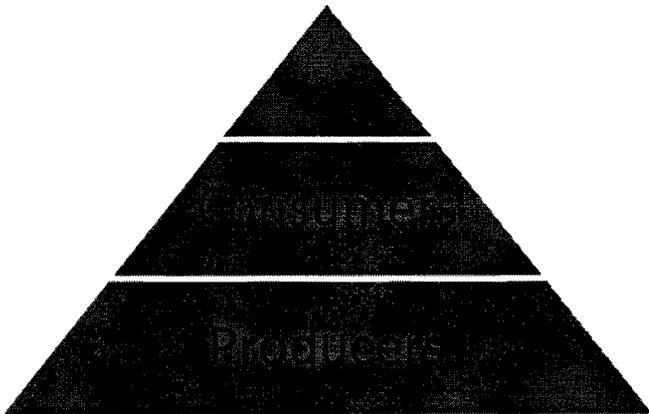
<p align="center"><u>Heterotrophic Organisms</u> Consumers Rely on others for food</p>	<p align="center"><u>Autotrophic Organisms</u> Producers Make their own food</p>
ex) Herbivore: plant eaters (deer, rabbits) Carnivore: meat eaters (lions, tigers) Omnivore: both plant eating & meat eating (humans, bears)	ex) Photosynthesis: Plants, Grass, Flowers

Scavenger: animals that feed on dead plant or animal matter

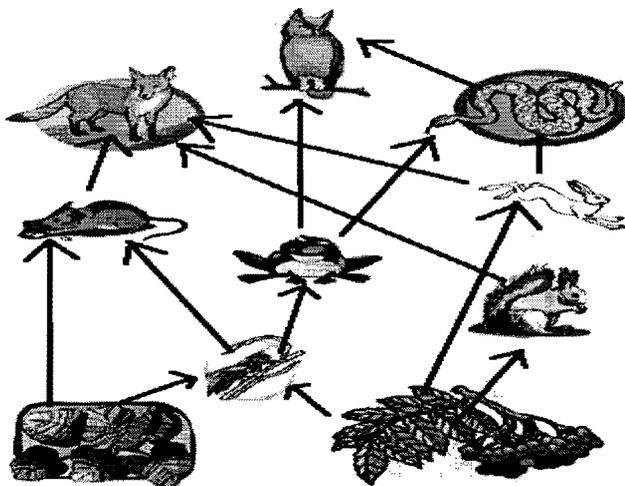
Decomposer: organisms use the energy of dead organisms for food & break them down into materials which can be recycled for use by other organisms

ex) bacteria, fungi

Food Chain/Food Web/Energy Pyramid:



*As you go up the pyramid;
Energy Decreases*



*Arrows Always Point Towards the Consumer;
 this Shows the Flow of Energy*

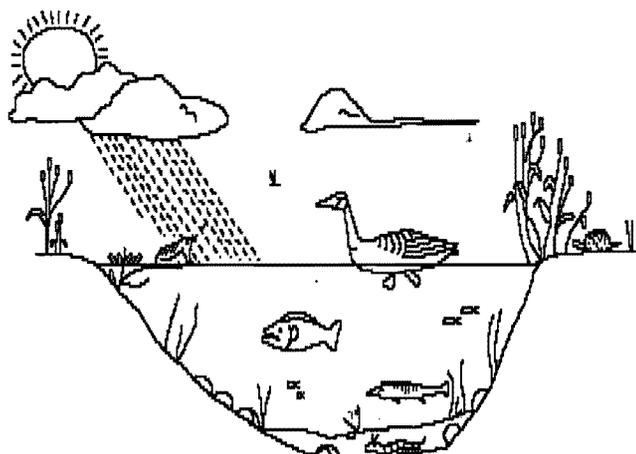
Symbiotic Relationships: (Close living associations)

Types of Symbiosis
<ol style="list-style-type: none">1) Parasitism: the parasite benefits at the expense of the host (tapeworm & human)2) Mutualism: both organisms benefit from the association (bee & flower)3) Commensalism: one organism is benefited and the other is unharmed (whale & barnacle)

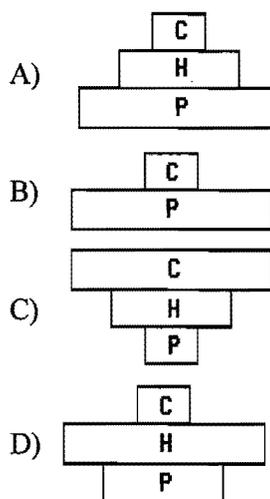
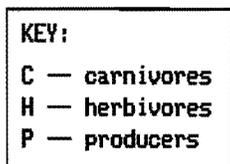
Name: _____

- 1) The study of the interactions between organisms and their interrelationships with the physical environment is known as
- A) physiology C) ecology
B) cytology D) embryology
- 2) The ecological niche of an organism refers to the
- A) role the organism plays in the community
B) relation of the organism to humans
C) position of the organism in a food web
D) biosphere in which the organism lives
- 3) In a freshwater pond community, a carp eats decaying material from around the bases of underwater plants, while a snail scrapes algae from the leaves and stems of the same plants. They can survive at the same time because they occupy
- A) the same niche, but different habitats
B) different habitats and niches
C) the same habitat, but different niches
D) the same habitat and the same niche
- 4) Many different species of organisms interacting in a particular environment are an example of a
- A) biome C) biosphere
B) population D) community
- 5) An orbiting satellite is sent into space as a balanced, self-contained biological unit, with each animal and plant species complementing the others and contributing to the balance. Together, the various animal and plant species in this environment represent
- A) a world biome
B) an ecological succession
C) a population
D) a community
- 6) The timber wolves, rabbits, and vegetation in a particular region of northern New York together constitute part of a
- A) genus C) species
B) community D) population
- 7) When a partially rotted log was turned over, fungi, termites, pill bugs, ants, slugs, and earthworms were found to be living in and around it. These organisms collectively represent a
- A) species C) population
B) community D) biosphere
- 8) Which sequence shows increasing complexity of levels of ecological organization?
- A) community, ecosystem, biosphere
B) ecosystem, biosphere, community
C) biosphere, ecosystem, community
D) biosphere, community, ecosystem
- 9) The biotic and abiotic factors interacting with each other in a pond form is known as
- A) a population C) an ecosystem
B) a community D) a food web
- 10) Which is a biotic factor operating within an ecosystem?
- A) the carnivores that consume other animals
B) the type of climate in a given region
C) the amount of helium gas in the air
D) the rate of flow of water in a river

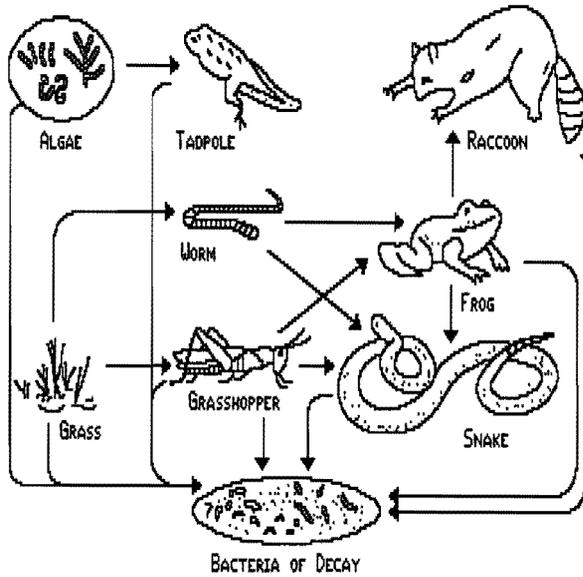
- 11) Which term best describes the interactions between the physical and living factors shown in the diagram below?



- A) a biome B) an ecosystem C) a community D) a biosphere
- 12) Which statement describes symbiotic relationships?
- A) Ecosystem feeding levels show changes in energy.
 B) Abiotic factors interact in an ecosystem.
 C) Saprophytes respond to abiotic changes in an ecosystem.
 D) Different species live in close associations in an ecosystem.
- 13) Bacteria which live in the human intestine derive their nutrition from digested foods. From these nutrients digested by the human, the bacteria synthesize vitamins usable by the human. This relationship demonstrates
- A) parasitism C) mutualism
 B) commensalism D) saprophytism
- 14) Decomposition and decay of organic matter are accomplished by the action of
- A) viruses and algae
 B) bacteria and fungi
 C) scavengers
 D) green plants
- 15) Most of the minerals within an ecosystem are recycled and returned to the environment by the direct activities of organisms known as
- A) producers
 B) secondary consumers
 C) primary consumers
 D) decomposers
- 16) The major environmental factor limiting the presence of numerous autotrophs at great depths in the ocean is the
- A) availability of minerals
 B) type of substratum
 C) amount of light
 D) absence of biotic factors
- 17) Which diagram best represents the usual relationships of biomass in a stable community?



- 18) The diagram below shows different species of organisms interacting with each other in and around a pond environment.

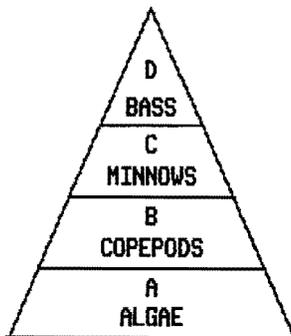


The adult frog represents a type of consumer known as a

- A) saprophyte C) parasite
 B) producer D) carnivore
- 19) Which is true of *most* producer organisms?
 A) They are parasitic.
 B) They contain chlorophyll.
 C) They are eaten by carnivores.
 D) They liberate nitrogen.

Questions 20 and 21 refer to the following:

The diagram below represents a food pyramid of organisms inhabiting a pond.



- 20) At which level of the food pyramid is the *smallest* percentage of total stored energy found?
 A) D C) C
 B) A D) B
- 21) What is the original source of energy for all organisms in the food pyramid?
 A) water C) carbon dioxide
 B) the substratum D) sunlight
- 22) In New York State, bluebirds and sparrows inhabit nearly the same ecological niche. In many areas, bluebirds are being replaced by the sparrows as a result of
 A) equilibrium C) competition
 B) mutualism D) symbiosis
- 23) Two different species with the same ecological niche are placed in the same habitat. These two species will most likely
 A) interbreed and produce hybrid offspring
 B) have different food requirements
 C) coexist successfully in the same habitat
 D) compete for the same environmental resources
- 24) Which event illustrates the interaction of an abiotic factor with a biotic factor in the environment?
 A) The temperature of water affects its oxygen level.
 B) A gypsy moth caterpillar eats the leaves of an apple tree.
 C) The low light intensity of the forest affects the growth of pine trees.
 D) The lamprey eel survives by parasitizing trout.
- 25) Which is an example of a changing biotic factor in an ecosystem?
 A) an increase in sunlight during the summer
 B) seasonal migration of birds
 C) seasonal changes in temperature
 D) an increase in the usual amount of winter snowfall

1) C 2) A 3) C 4) D 5) D

6) B 7) B 8) A 9) C 10) A

11) B 12) D 13) C 14) B 15) D

16) C 17) A 18) D 19) B 20) A

21) D 22) C 23) D 24) C 25) B