**Ecology Notes Guide: - General Biology B**

You are responsible not only for the material in this guide but the diagrams and pictures on the notes. The notes can be found on Mr. Walkers website: [www.walkersclass.com](http://www.walkersclass.com).

# **Ecology Unit:** Mr. Walker BHS

## \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the study of the interactions between organisms and their environment.

# **Objective 1: Describe the biotic and abiotic factors which limit population sizes**

### -\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ factors cause a populations growth to slow. They include availability of food, predators, lack of space etc.

### -Abiotic factors are non-living factors which can influence population growth. Such as temperature, availability of water etc.

### -Biotic factors are all living things that live in an environment.

# **Density Limiting Factors**

## -Density Dependent Factor: They include disease, competition, predators, parasites, and food. These factors have an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ effect as the population \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

## -Density Independent Factor: can affect populations regardless of their size or density. They include abiotic factors such as volcanic eruptions, temperature, storms, floods, drought, chemical pesticides, and major habitat disruptions. They are not dependent on population size.

# **Population Limitations**

## -Carrying capacity is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ number of individuals that an environment can support.

## -Life History Pattern: An organism’s reproductive pattern. They include Rapid life-history patterns where organisms have \_\_\_\_\_\_\_\_\_\_\_\_\_ body size, mature rapidly, reproduce early, and have short life spans. (example: mosquitos); Slow life-history patterns are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ species that live in stable environments. They reproduce and mature slowly and are long-lived. They maintain population sizes at or near the carrying capacity. (example: elephants)

# **Objective 2: Explain carrying capacities which limit organisms and populations in ecosystems.**

## -Carrying capacity is the maximum number of individuals that an environment can support.

## -Immigration is the movement of individuals \_\_\_\_\_\_\_\_\_\_\_- a population from another population.

## -Emigration is the movement of individuals \_\_\_\_\_\_\_\_\_\_\_\_\_ of a population and into another population

## **Objective 2 Cont.**

## -Exponential growth: The type of growth which occurs when a population size increases dramatically over a period of time. It appears as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ curve

## -Logistic growth: The type of growth where the population begins with a period of slow growth followed by a brief period of exponential growth before leveling off at a stable size. A graph of logistic growth takes the form of an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ curve

## -Population crash is a dramatic decline in the size of a population over a short period of time.

## -Predator-Prey relationship: Predators are types of consumers which seek out and eat other organisms. Prey are the organism which is being eaten by a predator.

# **Objective 3: Describe the levels of a food web**

## Food Web: A model which demonstrates the flow of energy in an ecosystem. It shows all the possible feeding relationships at each trophic level.

## Food Chain: a simple model that scientists use to show how matter and energy move through an ecosystem.

## Only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_percent of energy available to grasses is available to the squirrel.

### Available energy decreases at each trophic level.

# **Trophic levels of food webs**

## Energy Pyramid: An illustration which shows that there is less energy available on the top than on the bottom of the pyramid.

## Trophic Level: a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ step in a food chain which allows the passage of energy and materials.

## Producer: An organism that makes its own food (autotroph). Example: Plants

## Consumers: An organism that gets their energy by eating other organisms (heterotroph). Example: mice, starfish, humans, ants

## Herbivores: Consumers which only eat producers. (Plant eaters). Cows, sheep, deer, grasshoppers

## Carnivores: Consumers that eat only other consumers (flesh eaters). Examples: Lions, hawks, spiders

## Omnivores: Consumers that eat herbivores, carnivores, and producers. (Eater of all) Examples: Bears, Pigs, Humans

## Decomposers: Consumers that get their food by breaking down dead organisms, causing them to rot. Examples: Fungi, Bacteria

### -First-Order Heterotroph: A heterotroph which eats a producer. Example: Deer eats grass.

### -2nd-Order Heterotroph: A heterotroph which eats a 1st order heterotroph. Coyote eats deer which ate grass.

### -3rd-Order Heterotroph: A heterotroph which eats a 2nd order heterotroph. Bear eats coyote which ate deer, which ate grass.

# **Food Chains vs Food Webs**

## Food chain: A sequence in which energy is transferred from one organism to the next as each organism eats another. Example: Algae->Krill->Cod->Leopard Seal->Killer Whale.

## Trophic Level: Each step in the transfer of energy through an ecosystem.

## Food web: A collection of food chains which shows many of the feeding relationships in an ecosystem. See fig 3-7 Pg 60.

## Autotroph: An organism which produces its \_\_\_\_\_\_\_\_\_\_\_\_\_ food (Producer).

## Heterotroph: An organism which eats another organism. Example: Deer eats grass.

# **Objective 4: Explain the process of primary and secondary ecological succession.**

-Succession: A regular pattern of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ over time in the types of species in a community. Can take hundreds of thousands of years.

-Climax Community: The community that eventually forms if the land is left undisturbed.

-Primary Succession: Succession which occurred on surfaces where \_\_\_\_\_\_\_\_\_\_\_\_ ecosystem existed before.

-Secondary Succession: Succession which occurs on a surface where an ecosystem has previously existed.

-Pioneer Species: The first organisms to colonize any newly available area and start the process of succession.

# **Objective 4 Cont.**

## -Species: A group of organisms which can potentially interbreed successfully and produce offspring with similar characteristics and behavior as the parents.

## -Population: A group of organisms of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ species living within a defined area.

## -Community: All the populations of different species that live in the same place at the same time.

## -Ecosystem: Populations of plants and animals that interact with each other in a given area and with the abiotic components of that area.

# **Objective 5: Describe how human activity can disrupt and endanger species in an ecosystem including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change.**

## Endangered Species: An endangered species is a species which has been categorized as very likely to become extinct.

## Habitat: is the place where organism \_\_\_\_\_\_\_\_\_\_\_ out their lives

## Niche: is \_\_\_\_\_\_\_\_\_\_\_\_ a species finds food and lives out its life.

## Pollution: Pollution is the introduction of contaminants into the natural environment that cause adverse change

## Invasive Species:are plants, animals, or pathogens that are non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause harm.

## Native Species: A species that normally lives and thrives in a particular ecosystem.

## Climate change: is a change in the statistical distribution of weather patterns when that change lasts for an extended period of time