

**Study Questions**

# Principles of Ecology

## Organisms and Their Environments

**Ecology** → the study of the \_\_\_\_\_

**Biosphere** → the portion of the Earth that \_\_\_\_\_

- Many different environments exist here.
- Bio = life

**Biotic Factors** → all the \_\_\_\_\_ that inhabit an environment.

- Bio = life; tic = pertaining to.
- Animals, plants, fungi, bacteria, protists

**Abiotic Factors** → all the \_\_\_\_\_ of the environment

- A = not/without; bio = life
- Examples = soil, rocks, water, minerals, temperature

**NOTE:** All organisms depend on others for food, shelter, reproduction and protection. We must study an organism's relationship with other organisms at different levels and see how different factors affect them.

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**Levels of Biological Organization**

**Organism** →

**Population** →

**Community** →

**Ecosystem** →

**Biosphere** →

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**Niche vs. Habitat**

**Niche** → \_\_\_\_\_

- Includes the space, food, and other conditions the organism needs to survive.

**Habitat** → \_\_\_\_\_

**NOTE:** Several species may share a habitat, but the food, shelter, and resources of that habitat are divided into separate niches.

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**Energy in Ecosystems**

**Note:** Organisms interact in order to obtain energy and resources necessary to stay alive.

**Energy Flow** → energy flows thru an ecosystem in one direction:

**Autotrophs** → \_\_\_\_\_

- Auto = self
- Also called Producers

## **Heterotrophs**→

- Hetero = other
- Also called consumers

## **Types of Heterotrophs**

Herbivores→

Carnivores→

Scavengers→

Omnivores→

Detritivores→

**Food Chain**→ a model that shows how \_\_\_\_\_

- It has arrows that show the direction that energy is being transferred.

**Trophic Level**→ a \_\_\_\_\_ in a food chain that represents each organism.

**Food Web**→ shows all the possible feeding relationships at each trophic level in a community.

**Energy Pyramid**→Diagram that shows the \_\_\_\_\_ contained within each trophic level in a food chain or food web.

1. Pyramid of \_\_\_\_\_→Only about \_\_\_\_\_ of energy available within one trophic level is transferred to organisms at the next trophic level.
2. Pyramid of \_\_\_\_\_→Based on the number of individual organisms at each trophic level
3. Pyramid of biomass→The total amount of living tissue within a given trophic level is called \_\_\_\_\_.

A pyramid of biomass represents the amount of potential food available for each trophic level in an ecosystem.

## **Interactions between Organisms**

**Predation**→ an interaction in which one organism \_\_\_\_\_ on another organism.

**Symbiosis**→some relationships between organisms are close and permanent. They can be harmful or helpful or required for survival.

**Commensalism**→

**Mutualism**→

**Parasitism**→

**NOTE:** Energy and matter are constantly being recycled. A balance of everything going on in an ecosystem is called \_\_\_\_\_.

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## Nutrient Cycling

Matter cannot be replenished like the energy from sunlight. Matter must be recycled.

### Water Cycle

- Water occurs on Earth as a solid, liquid, and gas.

### Carbon Cycle

- Carbon is found in the environment as carbon dioxide.

### Nitrogen Cycle

- Nitrogen makes up almost 78% of air.
- Every living organism needs nitrogen to survive; however only some bacteria are able to use it directly from the air.

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## Pollution

**2 main causes:**

- \_\_\_\_\_
- \_\_\_\_\_

**These lead to:**

- **Air Pollution**
- **Acid Rain**
- **Greenhouse Effect**
- **Ozone Layer**
- **Water Pollution**
- **Toxic Chemicals**

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### Endangered Species

- Organisms threatened with extinction
- Caused by hunting, disease, pollution, habitat destruction
- Ivory-billed woodpecker

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## Factors affecting population dynamics

**Exponential growth** → occurs when the number of organisms rises at

\_\_\_\_\_

What are some things that prevent populations from growing exponentially?

**Carrying capacity** → the \_\_\_\_\_ over an indefinite period of time.

### **Limiting factors**

- Density-dependent
  - Have an \_\_\_\_\_ Disease, parasites, competition, crowding & stress
- Density-independent
  - Affects \_\_\_\_\_
  - Usually abiotic factors: storms, floods, temp, fire

### **Exotics**

- Can be introduced accidentally or on purpose
- Ex. Sika from Asia brought to South Texas

**How do you think introducing Sika into the population would affect the native population of deer?**