

ECOLOGY UNIT TEST STUDY GUIDE

TEST DATE: _____

Know...

Biotic Factor	Parasite	Energy Pyramid	Precipitation
Abiotic Factor	Habitat	Ecological Succession	Evaporation
Ecology	Niche	Primary Succession	Transpiration
Organism	Predation	Secondary Succession	Condensation
Population	Competition	Limiting Factor	Carbon Cycle
Community	Autotroph/Producer	Carrying Capacity	Photosynthesis
Ecosystem	Heterotroph/Consumer	Density Dependent Factor	Cellular Respiration
Biome	Herbivore	Density Independent Factor	Fossil Fuels
Biosphere	Omnivore	Population Density	Combustion
Symbiosis	Carnivore	Biodiversity	Nitrogen Cycle
Commensalism	Biomass ←	→ Adaptation	Nitrogen Fixation
Mutualism	Food Chain	Adaptation	Denitrification
Parasitism	Food Web	Adaptation	Phosphorus Cycle
Host	Trophic Level	Water Cycle	

Understand...

- The difference between abiotic and biotic factors.
- The relationship of the individual to a population, a community, an ecosystem and a biome.
- The major categories used to classify a biome.
- The defining characteristics of the terrestrial biomes and the zones of the aquatic biomes.
- The basic process of ecological succession (both primary and secondary) and when each takes place.
- The different types of symbiotic relationships (mutualism, commensalism, parasitism).
- The information illustrated in a food chain, food web, and energy pyramid.
- The relationship between limiting factors and the carrying capacity of a population.
- How matter/nutrients cycle within an ecosystem (water, nitrogen, carbon, phosphorus).
- How organisms obtain energy (autotrophs vs. heterotrophs).
- The differences in the types of consumers (herbivores, omnivores, carnivores).
- The major characteristics of the terrestrial and aquatic biomes.

Be Able To...

- Identify factors within an ecosystem as either abiotic or biotic.
- Analyze the flow of energy within a food chain and food web and be able to determine results of various scenarios.
- Identify the trophic levels of organisms within a food chain/web (producer, primary, secondary, & tertiary consumer).
- Compare and contrast density independent and density dependent factors.
- Determine the annual climate of a biome using graphical analysis.
- Provide examples of each type of symbiotic relationship (commensalism, mutualism, parasitism).
- Identify terrestrial and aquatic biomes based on their biotic and abiotic factors.
- Determine the carrying capacity of a population using graphical analysis.
- Explain the impact humans have on the Earth (pollution, global warming, pesticide, resource usage, GMO's, etc).
- Evaluate the adaptive responses of organisms to their environments (plant and animal adaptations).
- Compare and contrast primary and secondary succession.

Ecology Notes

study of interactions that take place between organisms and their environment

Our biosphere is Earth - holds all living things (includes Air, land, and sea)

Abiotic factors
Nonliving parts of an environment (Temperature, moisture, light, soil...etc)

Biotic factors
All living organisms that inhabit an environment (plants, other animals)

Depend on others directly or indirectly for food, shelter, reproduction, protection...

Levels of Organization

Organisms of an individual species make up → population
Group of organisms of the same species
Interbreed and live in the same area
Can compete for food, water, mates

of populations make up → community

Made up of interacting populations
Change in a population can affect entire community

Populations + abiotic factors make up → ecosystem

Terrestrial ecosystems (land): forests, meadows
Aquatic ecosystems (water): oceans, lakes, ponds, rivers

Habitat: place where an organism lives

Can change or disappear because of natural and human causes
Niche: all the ways and adaptations a species uses in its environment
How it meets its needs for food, shelter, survival, reproduction

Predation

Consumers that eat animals are predators (the ones eaten are prey)

Symbiosis (Symbiotic Relationships)

Relationship where there is a close and permanent association between different organisms
Means "living together"

- 1. Mutualism** - Both species benefit (+,+)
- 2. Commensalism** - one benefits and the other does not benefit nor is it harmed (+,0)
- 3. Parasitism** - one benefits and the other is harmed (+,-)

How Organisms Get Energy

Sun is the ultimate form of energy and source of energy for most organisms
Producers: autotrophs Ex: grass, trees, green algae
Uses light to make own food (photosynthesis) and energy
OR use chemicals to make food (chemosynthesis)

Consumers

Heterotrophs - Eat other organisms to get energy - CANNOT make its own food
Herbivores - Only eat plants
Carnivores - Only eat animals

Release CO2 back into the atmosphere

Global Warming:

Greenhouse effect

Problems with Cycle

Gases that lead to global warming

Nitrogen Cycle

Plants need nitrogen to make proteins, but they can't use the nitrogen gas, so...

Lightning and some bacteria convert nitrogen in the air into a usable form called nitrate (N+O)

Plants use the nitrate...

Herbivores and Humans eat plants (Convert animal, plant proteins to human proteins)

Nitrogen molecules return to the soil as waste (urine, feces) and also when animals die

Phosphorus Cycle

All organisms need phosphorus for growth and development

1. Plants get phosphorus from the soil

2. Animals get phosphorus by eating plants

3. Decompose when they die, returning phosphorus to the soil

Problems:

Eutrophication

Impact of Human Activities on the Environment

Population growth

Pollution

Global warming

Burning fossil fuels

Habitat destruction

Introducing nonnative species

Ecology Review #2:

1. A lone elephant joining another herd of elephants is an example of

a. emigration

b. parasitism

2. What term is used to describe a species whose population is rapidly shrinking and might disappear completely?

a. endangered

b. threatened

c. extinct

d. invasive

Name _____ Date _____ Period _____

PRINCIPLES OF ECOLOGY — CHAPTERS 2, 3 AND 4

1. ECOLOGY

a. Define ecology. the study of interactions between organisms in their environment

b. What is the difference between biotic and abiotic factors in an ecosystem?

biotic factors are living

abiotic factors are non-living

c. Identify 3 examples of both biotic and abiotic factors in the rainforest.

biotic = plants, animals, bacteria, fungi

abiotic = temperature, soil, water, sunlight

2. ECOLOGICAL LEVELS OF ORGANIZATION

a. The biosphere is the portion of the Earth which contains life.

b. In order from smallest to largest, what makes up the biosphere?
organism → Population → Community → ecosystem → biome → BIOSPHERE

c. For each level of organization, describe and give an example of its contents.

Organization	Population	Community	Ecosystem	Biome	Biosphere
Examples dog	all dogs in Medina	dogs, cats, hamsters in Medina	living & nonliving things in Medina	all ecosystems similar to Medina	all living & nonliving on Earth
Description Individual					

3. TERRESTRIAL BIOMES

a. Identify the four major categories used to classify a biome.

Precipitation, temperature, plants, animals

b. List the terrestrial biomes.

Climate

Desert, grasslands, shrubland, Chapparral, temperate deciduous forests, coniferous forest, tropical rainforest

10. ENERGY IN AN ECOSYSTEM

a. Explain the difference between autotrophs and heterotrophs and the way they obtain energy/food.

Autotrophs - make food
 heterotrophs - consume food

b. Herbivores eat Plants Carnivores eat meat (animals)

c. What do omnivores eat? Plants & animals

11. MODELS OF ENERGY FLOW

a. The trophic level of an organism identifies its position in the food chain/web.

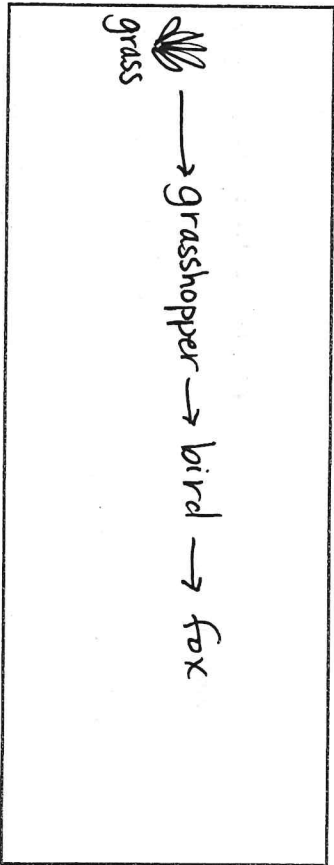
b. Which type of organism ALWAYS makes up the first trophic level? Why? Producers, because they can make food from sunlight

c. What does an arrow in a food web or food chain illustrate?

the energy flow

d. A food web shows ALL feeding relationships within a biological community.

e. Draw a simple food chain in the box below. Label the following terms: producer, primary consumer, secondary consumer, and tertiary consumer.



12. ENERGY PYRAMIDS

a. 90 % of energy is lost at each trophic level, while only 10 % is retained.

b. Describe the purpose of an energy pyramid. TD show the amount of energy (or biomass) at each level

c. Which type of organism has the most available energy and therefore the largest biomass? Producers

d. Why would large carnivores, such as an orca (killer whale), be at the top of an energy pyramid? because they have less energy available to them

Name _____ Date _____ Period _____

THE CYCLING OF NUTRIENTS - NOTES ORGANIZER

1. The Cycling of Nutrients

a. In what way are you connected to Albert Einstein? We have access to the same matter & energy that Albert Einstein did

b. Why is it necessary for nutrients to cycle? There is a limited amount of them

c. Carbon, Hydrogen, Oxygen and Nitrogen are the building blocks of amino acids, which are the building blocks of proteins, which are the building blocks of cells, which are the building blocks of LIFE!!

2. The Water Cycle (Hydrologic cycle)

a. What is the Water Cycle? the process of water moving through living things or bodies of water to the atmosphere and then back to Earth

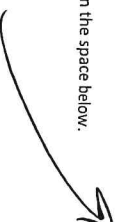
b. Nearly 70 % of the Earth's surface is covered in water.

c. Describe the following steps of the Water Cycle

Evaporation	water changes from liquid to gas
Transpiration	water evaporates through leaves
Condensation	water changes from gas to liquid
Precipitation	water falling to Earth (rain, sleet, hail, snow)

d. Pause the video and draw a (simple) picture which illustrates the Water Cycle in the space below.

on back page



5. The Phosphorus Cycle

a. What cycle is the Phosphorus Cycle most like?

the Nitrogen cycle

b. What is the Phosphorus cycle? **process of phosphorus cycling through living + non living things**

c. **phosphorus** is an essential nutrient for plants and animals.

d. Why is phosphorus a necessary nutrient? **part of lipids, ATP**

e. What two processes cause rocks to release inorganic phosphate?
rain, weathering

f. Where does inorganic phosphate go once it has been released from the rocks?
plants use it

g. **plants** take up inorganic phosphate from the soil.

h. How do animals get phosphate?
by eating plants

i. How does organic phosphate get into the soil?
decomposition

j. What turns organic phosphate into inorganic phosphate?
bacteria

k. Pause the video and draw a (simple) picture which illustrates the Phosphorus Cycle in the space below.

