

Unit 12 Study Guide KEY

SECTION 13.1. ECOLOGISTS STUDY RELATIONSHIPS

1. **Description:** an individual living thing; **Example:** any individual organism, such as a moose
2. **Description:** a group of the same species that lives in one area; **Example:** any group of animals of the same species, such as a herd of moose
3. **Description:** group of different species that live together in one area; **Example:** any groups of different species that live in the same area, such as herds of moose and bison
4. **Description:** includes all of the organisms as well as the climate, soil, water, rocks, and other nonliving things in a given area; **Example:** any ecosystem, such as the Greater Yellowstone Ecosystem
5. **Description:** a major regional or global community of organisms; **Example:** any biome, such as a temperate grassland
6. observation is the act of carefully watching something over time
7. direct surveys are used for animals that are easy to follow and involve watching animals with the naked eye or with tools such as binoculars or scopes; indirect surveys are used for species that are difficult to track and involve searching for other signs of an animal's presence, such as looking for feces or a recent kill
8. **Laboratory:** benefit: able to control variables, drawback: experiments are performed in artificial settings that may not completely reflect a real setting; **Field:** benefit: more accurately reflects real conditions, drawback: harder to control all variables
9. scientists might want to use a model when their experiment is not practical to perform in real-time, such as when attempting to forecast how conditions might change in the future; models are also used to predict how changing one or more variables may affect future conditions
10. Ecology is the study of the interactions among living things, and between living things and their surroundings.
11. a biome contains both ecosystems and communities of organisms

SECTION 13.2. BIOTIC AND ABIOTIC FACTORS

1. living, nonliving
2. Biotic, plants, animals
3. Abiotic, moisture, temperature, wind
4. Biodiversity is the variety of organisms found within a specific area.
5. keystone species
6. When they build dams, beavers change free-flowing stream habitats into ponds, wetlands, and meadows. This change provides habitat for a number of different species, including fish, birds, and insects, increasing the area's biodiversity.
7. Abiotic factors are nonliving things, biotic factors are living things
8. a keystone species is a species that holds together a healthy ecosystem; its presence has a large impact on the rest of the ecosystem
Be Creative: drawings will vary; biotic factors may include plants and animals; abiotic factors may include soil, Sun, precipitation

SECTION 13.3. ENERGY IN ECOSYSTEMS

1. Producers, nonliving, autotrophs
2. Consumers, eating, heterotrophs
3. Producers provide the basis for an ecosystem's energy.
4. Most producers need sunlight to make food, and consumers are dependent on producers to provide the base of the food chain in an ecosystem. Consumers are therefore indirectly dependent on the sun for their energy as well.
5. **Photosynthesis:** process in which carbohydrates are formed, energy is obtained from sunlight; **Chemosynthesis:** process in which carbohydrates are formed, energy is obtained from chemicals; **Both:** process in which carbohydrates are formed
6. An autotroph makes its own food (nourishment), while a heterotroph must get nourishment from other resources
7. in photosynthesis, energy is obtained from sunlight, in chemosynthesis, energy is obtained from chemicals
8. a producer gets its energy from nonliving resources while a consumer gets its energy by eating other living or once-living organisms

SECTION 13.4. FOOD CHAINS AND FOOD WEBS

1. producer, consumer, ecosystem
2. herbivore
3. carnivore
4. omnivore
5. detritivore
6. decomposer
7. primary consumer
8. secondary consumer
9. tertiary consumer
10. trophic levels
11. A food web shows the complex network of feeding relationships within an ecosystem, while a food chain is simpler, showing only a single chain of producers and consumers.
12. Some energy is stored within an organism, and some energy is dissipated into the environment.
13. producer
14. a specialist is a consumer that primarily eats one specific, or particular, organism or feeds on a very small number of organisms, while generalist is a consumer that has a general, or varying diet, and doesn't rely on any one organism on which to feed
15. herbivores eat plants, carnivores eat meat, omnivores eat both plants and meat

SECTION 13.5. CYCLING OF MATTER

1. **Description:** process in which water or snow falls to Earth
2. **Description:** process in which water droplets reenter the atmosphere
3. **Description:** process in which water vapor is released from plant leaves
4. **Description:** process in which water vapor in the atmosphere condenses to form clouds
5. oxygen, respiration
6. photosynthesis, carbon dioxide, respiration
7. carbon dioxide
8. respiration, decomposition
9. Combustion
10. nitrogen fixation is a process in which certain types of bacteria convert gaseous nitrogen into ammonia
11. (1) Phosphate is released by the weathering of rocks. (2) Plants and some fungi take up phosphate in their roots. (3) Phosphorus moves from producers to consumers via the food web. (4) During decomposition, phosphorus is returned to the soil. (5) Some phosphorus leaches into the water supply, and may become locked into sediments at the bottom of the water body. Over time, the sediments form rocks, and the cycle starts again when phosphate is released by these rocks when they erode.
12. Many power plants burn some type of fossil fuel to generate electricity. Widescale use of electricity would cause excessive amounts of carbon to be released into the atmosphere.
13. Answers will vary. A good answer might be: Particles thrown up into the atmosphere by the impact would have blocked and reduced the amount of sunlight reaching the Earth for several years. This would have adversely affected photosynthesis, disrupting the biogeochemical cycles.
14. a biogeochemical cycle is the movement of a particular chemical through the biological (living), geological (nonliving/earth), and chemical parts of an ecosystem
15. the movement of water from the atmosphere to the surface of Earth, below ground, and back

SECTION 13.6. PYRAMID MODELS

1. biomass
2. heat, waste
3. *From bottom of pyramid to top:* producers, primary consumers, secondary consumers, tertiary consumers
4. an energy pyramid is a diagram that compares energy used by producers, primary consumers, and other trophic levels
5. a biomass pyramid is a diagram that compares the biomass of different trophic levels within an ecosystem
6. a pyramid of numbers is a diagram that shows the numbers of individual organisms at each trophic level in an ecosystem
7. biomass is a measure of the total dry mass of organisms in a given area
8. answers will vary depending on ecosystem

SECTION 14.1. HABITAT AND NICHE

1. a habitat is all of the biotic and abiotic factors in the area where an organism lives, while a niche includes all physical, chemical, and biological factors that a species needs to survive, stay healthy, and reproduce
2. habitat: food, other lions, trees, watering hole, wildebeest, zebra, sand, temperature, grass, savanna; niche: all of the above plus hunting behavior
3. a principle that states that when two species are competing for the same resources, one species will be better suited to the niche and the other species will either be pushed into another niche or become extinct
4. one competitor is pushed out of a niche by another competitor, niche partitioning (resources are divided among competitors), evolutionary response (divergent evolution occurs)
5. species that occupy similar niches but live in different geographical regions
6. ecological equivalents live in two different geographic locations and therefore do not compete for the same resources
7. a habitat is an area or environment where an organism or ecological community normally dwells, or lives
8. two species that use the same resources in the same way compete together; the species that is less suited (less well-adapted) will be pushed out of (excluded from) the niche or become extinct
9. in math an equivalent refers to two sets that have identical or corresponding parts; in a similar way, ecological equivalents are two species that occupy identical niches but occur in different regions

SECTION 14.2. COMMUNITY INTERACTIONS

1. intraspecific
2. interspecific
3. interspecific
4. intraspecific
5. intraspecific
6. drawings will vary, may include one animal chasing another, one animal eating another, among other acceptable answers
7. **Mutualism:** *A* benefits, *B* benefits; **Commensalism:** *A* benefits, *B* no impact; **Parasitism:** *A* benefits, *B* harmed
8. both refer to relationships in which one organism benefits and the other is harmed/eaten; parasitism is a symbiotic relationship in which two organisms live in close contact with one another, such a close relationship is not necessary for predation
9. an endoparasite lives on the inside of its host and an ectoparasite lives on the outside of its host
10. symbiosis is an ecological relationship between members of at least two different species that live together in direct contact
11. mutual refers to a relationship, such as a mutual agreement; mutualism is a symbiotic relationship in which both organisms benefit
12. sketches will vary

SECTION 14.3. POPULATION DENSITY AND DISTRIBUTION

1. number of individuals/area (units²)
2. lack of predators, plenty of food resources
3. Refer to Visual Vocab in Section 3 for visual answers; clumped, uniform, random
4. clumped dispersion— individuals may live close together in groups to facilitate mating, gain protection, or access food resources; uniform dispersion—territoriality and intraspecies competition for limited resources lead to individuals living at specific distances from one another
5. a reproductive strategy is the way an animal reproduces; for an animal with many predators, it makes sense to lay thousands of eggs because that ensures that at least a few might survive to adulthood; those animals with fewer predators can invest more time in caring for their young
6. Type I
7. Type II
8. Type II
9. Type II
10. Type III
11. Type III
12. Type I
13. Type I
14. population density is a measurement of the number of individuals living in a defined space while a population dispersion is the

way in which individuals of a population are spread in an area or a volume

SECTION 14.4. POPULATION GROWTH PATTERNS

1. immigration
2. deaths
3. births
4. emigration
5. when resources are abundant, populations can grow at a more rapid pace; when resources are lacking, populations begin to decline
6. Exponential growth: J-shaped curve, occurs when a population size increases dramatically over a period of time
Logistic growth: S-shaped curve, a population begins with a period of slow growth followed by a brief period of exponential growth before leveling off at a stable size
7. logistic growth
8. exponential growth; the population may outgrow available resources such as food
9. competition, predation, parasitism and disease
10. unusual weather, natural disasters, human activities
11. immigration is the movement of individuals into a population; emigration is the movement of individuals out of a population
12. a density-dependent limiting factor depends on the population density; a density-independent limiting factor does not depend on population density
13. exponential growth occurs when a population increases rapidly over a short time; logistic growth occurs when a population grows slowly for awhile, has a short period of exponential growth, then levels off at a stable size

SECTION 14.5. ECOLOGICAL SUCCESSION

1. the sequence of biotic changes that regenerate a damaged community or create a community in a previously uninhabited area
2. (1) 0–15 years, moss, lichens, and other pioneer species grow; (2) 15–80 years, shrubs, cottonwoods, and alder thickets grow; (3) 80–115 years, transition to forest; (4) 115–200 years, hemlock-spruce forest
3. (1) 0–2 years, weeds and other plants grow; (2) 2–18 years, grass, shrubs, and pine seedlings grow; (3) 18–70 years, pine forest and young hardwood seedlings grow; (4) 70–100 years, oak-hickory forest
4. primary succession is the establishment and development of an ecosystem in an area that was previously uninhabited, the process of primary succession might be started by glacial retreat, volcanic eruptions, or landslides. Secondary succession is the reestablishment of a damaged ecosystem in an area where soil was left intact; the process of secondary succession might be started after a flood or fire.
5. a pioneer is the first person to settle a new area; likewise, a pioneer species is the first species to inhabit a once-empty area

SECTION 19.1. DIVERSITY OF PROTISTS

1. eukaryotes
2. protists may be single-celled, colonial, or multicellular
3. No, the size of protists range from microscopic to very large.
4. All protists can reproduce asexually. Some protists can reproduce both asexually and sexually.
5. heterotroph
6. single-celled
7. plantlike protist
8. autotroph
9. funguslike protist
10. Protista
11. Eukarya
12. Because they are both eukaryotes, protists are more closely related to animals than bacteria, which are prokaryotes.
13. slime molds
14. algae
15. The term protist includes all eukaryotic single-celled, colonial, and multicellular organisms that are not animals, plants, or fungi. It does not include the single-celled bacteria or archaea, which are prokaryotes. **Sketch It Out:** One circle should be placed around all of the prokaryotes: Bacteria and Archaea. The other circle should be placed around all of the eukaryotes: Animalia, Plantae, and Protista

SECTION 19.6. ECOLOGY OF FUNGI

1. Fungi return nutrients such as carbon, nitrogen, and minerals back to the soil.
2. The large surface area of their mycelia allow quick recycling of nutrients.
3. lignin and cellulose
4. Fungi can damage fruit trees and wooden structures such as houses and boats.
5. obligate pathogens
6. Antibiotics can destroy beneficial bacteria in the human digestive system, allowing other organisms such as fungi to take their place.
7. ringworm and athlete's foot
8. Dutch elm disease, peach scab, gray mold
9. other fungi
10. Sketch should include densely packed and loosely packed fungal hyphae and a layer of algal cells.
11. The alga photosynthesizes, providing sugars to feed both the alga and the fungus.
12. producer and decomposer
13. The fungal mycelium can help absorb nutrients and water faster than the plant roots could alone.
14. The fungus gets sugars and nutrients from the plants.
15. They boost plant growth and produce chemicals that help fight harmful bacteria.
16. food
17. healthcare
18. mushrooms
19. yeast for bread
20. citric acid for candy
21. Fungi and algae (or photosynthetic bacteria)