

Biomes, Ecosystems, and Communities Worksheets

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CHAPTER

1

Biomes, Ecosystems, and Communities Worksheets

CHAPTER OUTLINE

- 1.1 Biomes
 - 1.2 Terrestrial Biomes
 - 1.3 Aquatic Biomes
 - 1.4 Community Interactions
-

Chapter 16: Biomes, Ecosystems and Communities Worksheets

- Lesson 16.1: Biomes
- Lesson 16.2: Terrestrial Biomes
- Lesson 16.3: Aquatic Biomes
- Lesson 16.4: Community Interactions

1.1 Biomes

Lesson 16.1 True or False

Name _____ Class _____ Date _____

Write true if the statement is true and false if the statement is false.

- _____ 1. Climate is the most important abiotic factors affecting terrestrial biomes.
- _____ 2. Climate is determined only by distance from the equator.
- _____ 3. The northern temperate zone goes from the equator to the arctic circle.
- _____ 4. The moisture of a biome is determined solely by precipitation.
- _____ 5. When air masses cool, they can hold more water vapor.
- _____ 6. Coastal areas may have warmer winters and cooler summers than inland areas.
- _____ 7. Between the equator and 20° north latitude, the climate is very dry.
- _____ 8. Warm, sunny areas have less evaporation than cool, cloudy areas.
- _____ 9. Dry climates are found only where the weather is hot and sunny.
- _____ 10. Air masses that have passed over a wide expanse of land carry little moisture.
- _____ 11. Climate has no influence on the quality of soil in an area.
- _____ 12. Adaptations to dryness include thick, barrel-like stems in plants.

Lesson 16.1: Critical Reading

Name _____ Class _____ Date _____

Read this passage from the lesson and answer the questions that follow.

Climate and Plant Growth

Plants are the major producers in terrestrial biomes. Almost all other terrestrial organisms depend on plants either directly or indirectly for food. Plants need air, warmth, sunlight, water, and nutrients to grow. Climate is the major factor affecting the number and diversity of plants that can grow in a terrestrial biome. Climate determines the average temperature and precipitation, the length of the growing season, and the quality of the soil, including levels of soil nutrients.

Growing Season

The growing season is the period of time each year when it is warm enough for plants to grow. The timing and length of the growing season determine what types of plants can grow in an area. For example, near the poles the growing season is very short. The temperature may rise above freezing for only a couple of months each year. Because of the cold temperatures and short growing season, trees and other slow-growing plants are unable to survive. The growing season gets longer from the poles to the equator. Near the equator, plants can grow year-round if they have

enough moisture. A huge diversity of plants can grow in hot, wet climates. The timing of precipitation also affects the growing season. In some areas, most of the precipitation falls during a single wet season (such as in California), rather than throughout the year (such as in New England). In these areas, the growing season lasts only as long as there is enough moisture for plants to grow.

Soil

Plants need soil that contains adequate nutrients and organic matter. Nutrients and organic matter are added to soil when plant litter and dead organisms decompose. In cold climates, decomposition occurs very slowly. As a result, soil in cold climates is thin and poor in nutrients. Soil is also thin and poor in hot, wet climates because the heat and humidity cause such rapid decomposition that little organic matter accumulates in the soil. The frequent rains also leach nutrients from the soil. Soil in temperate climates is typically thicker and richer in nutrients. It contains more organic matter and is the best soil for growing most plants.

Questions

1. Why do most terrestrial organisms depend on plants?

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2. List what plants need to grow.

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3. What factors determine the growing season in a given location?

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4. What do plants need in soil? What type of soil is best for most plants?

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5. Why are soils thin and poor in hot, wet climates?

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Lesson 16.1: Multiple Choice

Name_____ Class_____ Date_____

Circle the letter of the correct choice.

- a. Major subdivisions of the biosphere are called

- a. niches.
 - b. habitats.
 - c. climate zones.
 - d. biomes.
- b. Climates are classified as tropical, temperate, or arctic based on their
- a. air pressure.
 - b. temperature.
 - c. precipitation.
 - d. wind speed.
- c. Coastal areas tend to be mild because
- a. coastal winds blow severe weather out to sea.
 - b. the temperature of the ocean changes little from season to season.
 - c. coastal areas are always at low latitudes.
 - d. dense forests protect coastal areas from extreme weather.
- d. The major producers in terrestrial biomes are
- a. plants.
 - b. bacteria.
 - c. algae.
 - d. herbivores.
- e. Plants need nutrients that are naturally added to soils in the process of
- a. leaching.
 - b. root growth.
 - c. adaptation.
 - d. decomposition.
- f. Biodiversity is usually greater in biomes that are
- a. wetter.
 - b. warmer.
 - c. closer to the equator.
 - d. all of the above.

Lesson 16.1: Vocabulary

Name_____ Class_____ Date_____

Match the vocabulary term with the correct definition.

Term

- ___ 1. biome
- ___ 2. climate
- ___ 3. weather
- ___ 4. latitude
- ___ 5. altitude
- ___ 6. tropical zone
- ___ 7. temperate zone

- ____ 8. rain shadow
- ____ 9. growing season
- ____ 10. biodiversity

Definition

- a. conditions of temperature and precipitation on any given day
- b. zone from the tropical zone to the arctic or antarctic circle.
- c. land on the leeward side of a mountain range that receives little precipitation
- d. group of similar ecosystems that cover a broad area
- e. the number of different species of organisms in a biome or ecosystem
- f. zone from the Tropic of Capricorn to the Tropic of Cancer
- g. average weather in an area over a long period of time
- h. distance north or south of the equator
- i. period of time each year when it is warm enough for plants to grow
- j. distance above sea level

1.2 Terrestrial Biomes

Lesson 16.2: True or False

Name _____ Class _____ Date _____

Write true if the statement is true and false if the statement is false.

- _____ 1. The distribution of terrestrial biomes reflects patterns of temperature and moisture.
- _____ 2. All tundra biomes have high biodiversity.
- _____ 3. Arctic tundra is found in the Rocky Mountains in the United States.
- _____ 4. Only Alpine tundra has permafrost.
- _____ 5. When permafrost melts, it releases greenhouse gases.
- _____ 6. The primary vegetation in boreal forests is lichen.
- _____ 7. There are boreal forests in Canada and the United States.
- _____ 8. Temperate rainforests consist mainly of evergreen trees such as hemlocks and firs.
- _____ 9. Chaparral is a type of tropical biome.
- _____ 10. The largest deserts are found at about 60° north or south latitude.
- _____ 11. Death Valley is an example of rain shadow desert.
- _____ 12. Little sunlight reaches the floor of a tropical dry forest.

Lesson 16.2: Critical Reading

Name _____ Class _____ Date _____

Read this passage from the lesson and answer the questions that follow.

Arctic and Subarctic Biomes

Arctic and subarctic biomes are found near the north and south poles or at high altitudes in other climate zones. The biomes include tundra and boreal forests. Both have cold, dry climates and poor soil. They can support only limited plant growth and have low biodiversity. The remainder of this passage describes tundra biomes.

Tundra

Tundra is an arctic biome where it is too cold for trees to grow. Outside of the polar ice caps, tundra has the coldest temperatures on Earth. There are two types of tundra: arctic tundra, which is also found in Antarctica, and alpine tundra, which is found only at high altitudes.

- **Arctic tundra** occurs north of the arctic circle and south of the antarctic circle. It covers much of Alaska and vast areas of northern Canada and Russia. It is also found along the northern coast of Antarctica.
- **Alpine tundra** occurs in mountains around the world at any latitude, but only above the tree line. The **tree line** is the edge of the zone at which trees are able to survive. Alpine tundra is found in the Rocky Mountains

in the United States and in several other mountain ranges around the world.

Both types of tundra receive very low precipitation, but little of it evaporates because of the cold. Arctic tundra has **permafrost**, which is frozen soil year-round. The top layer of soil thaws in the summer, but deeper layers do not. As a result, water cannot soak into the ground. This leaves the soil soggy and creates many bogs, lakes, and streams. Alpine tundra does not have permafrost, except at very high altitudes. Therefore, alpine tundra soil tends to be dry rather than soggy.

Global warming poses a serious threat to arctic tundra biomes because it is causing the permafrost to melt. When permafrost melts, it not only changes the tundra. It also releases large amounts of methane and carbon dioxide into the atmosphere. Both are greenhouse gases, which contribute to greater global warming.

The most common types of vegetation in tundra are mosses and lichens. They can grow in very little soil and become dormant during the winter. Tundra is too cold for amphibians or reptiles, which cannot regulate their own body heat. Insects such as mosquitoes can survive the winter as pupae and are very numerous in summer. In addition, many species of birds and large herds of caribou migrate to arctic tundra each summer. However, few birds and mammals live there year-round. Those that remain have adapted to the extreme cold. Polar bears are an example. They have thick fur to insulate them from the cold. In alpine tundra, animals must adapt to rugged terrain as well as to cold. Alpine animals include mountain goats, which not only have wool to keep them warm but are also sure-footed and agile.

Questions

1. Where are arctic and subarctic biomes located?

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2. Describe arctic tundra.

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3. Where is alpine tundra found? How does it differ from arctic tundra?

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4. How is global warming threatening arctic tundra biomes?

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5. What species are commonly found in tundra biomes?

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Lesson 16.2: Multiple Choice

Name_____ Class_____ Date_____

Circle the letter of the correct choice.

- a. A humid biome between 30° south and 30° north latitude is called a
 - a. tropical rainforest.
 - b. tropical dry forest.
 - c. boreal rainforest.
 - d. chaparral forest.
- b. Alpine tundra biomes are found only
 - a. north of the arctic circle.
 - b. close to the South Pole.
 - c. at 90° north or south latitude.
 - d. above certain altitudes.
- c. What type of climate would you expect in a boreal forest?
 - a. continental climate
 - b. temperate climate
 - c. tropical climate
 - d. subtropical climate
- d. Cone-bearing, needle-leaved evergreen trees such as spruces are called
 - a. deciduous trees.
 - b. conifers.
 - c. epiphytes.
 - d. shrubs.
- e. Which biome, found in central and southern California, has a Mediterranean climate?
 - a. rainforest
 - b. conifer forest
 - c. boreal forest
 - d. chaparral
- f. Deserts are characterized by
 - a. humid air masses.
 - b. extreme daily temperature variations.
 - c. rich soil with a high organic content
 - d. more than 25 centimeters of precipitation per year.
- g. Which sentence is true about tropical grassland biomes?
 - a. They receive very high rainfall.
 - b. They are found mainly in Europe.
 - c. They have cool temperatures.
 - d. They have large herds of herbivores.

Lesson 16.2: Vocabulary

Name_____ Class_____ Date_____

Match the vocabulary term with the correct definition.

Term

- ____ 1. tundra
- ____ 2. temperate deciduous forest
- ____ 3. temperate rainforest
- ____ 4. temperate grassland
- ____ 5. tropical grassland
- ____ 6. desert
- ____ 7. boreal forest
- ____ 8. tropical dry forest
- ____ 9. tropical rainforest
- ____ 10. chaparral

Definition

- a. tropical biome that receives heavy rainfall and consists mainly of tall, broadleaf evergreen trees
- b. temperate biome that receives relatively low precipitation and consists mainly of grasses
- c. tropical biome that receives relatively low rainfall, has a dry season, and consists mainly of widely spaced, drought-adapted trees
- d. arctic biome where it is too cold for trees to grow
- e. temperate biome with a Mediterranean climate that consists mainly of densely-growing evergreen shrubs such as scrub oak
- f. temperate biome that receives moderate rainfall and consists mainly of deciduous trees such as maples
- g. tropical biome that receives relatively low rainfall, has a dry season, and consists mainly of grasses
- h. temperate or tropical biome that receives no more than 25 centimeters of precipitation per year
- i. temperate biome that receives heavy rainfall and consists mainly of evergreen trees such as hemlocks
- j. subarctic biome covered with conifers

1.3 Aquatic Biomes

Lesson 16.3: True or False

Name _____ Class _____ Date _____

Write true if the statement is true and false if the statement is false.

- _____ 1. Most aquatic organisms have to deal with extremes of temperature.
- _____ 2. Aquatic biomes have more total biomass than terrestrial biomes.
- _____ 3. There is generally plenty of oxygen to support organisms in the photic zone.
- _____ 4. Oceanic biomes occur in ocean water over the continental shelf.
- _____ 5. Nekton are aquatic organisms that can make their own food.
- _____ 6. Sponges and clams are examples of benthic organisms.
- _____ 7. Water at the bottom of the ocean is always cold.
- _____ 8. The intertidal zone has very low biodiversity.
- _____ 9. Corals are colored rocks found at the bottom of tropical ocean water.
- _____ 10. The depth of the photic zone in a lake depends on clarity of water.
- _____ 11. Plants are important producers in ocean water biomes.
- _____ 12. Both riparian zones and wetlands help prevent erosion.

Lesson 16.3: Critical Reading

Name _____ Class _____ Date _____

Read this passage from the lesson and answer the questions that follow.

Marine Biomes

Marine biomes are aquatic biomes found in the salt water of the ocean. Major marine biomes include neritic, oceanic, and benthic biomes. Neritic and oceanic biomes are described in the rest of this passage.

Neritic Biomes

Neritic biomes occur in ocean water over the continental shelf. They extend from the low-tide water line to the edge of the continental shelf. The water here is shallow, so there is enough sunlight for photosynthesis. The water is also rich in nutrients, which are washed into the water from the nearby land. Because of these favorable conditions, large populations of phytoplankton live in neritic biomes. They produce enough food to support many other organisms, including both zooplankton and nekton. As a result, neritic biomes have relatively great biomass and biodiversity. They are occupied by many species of invertebrates and fish. In fact, most of the world's major saltwater fishing areas are in neritic biomes.

Oceanic Biomes

Oceanic biomes occur in the open ocean beyond the continental shelf. There are lower concentrations of dissolved nutrients away from shore, so the oceanic zone has a lower density of organisms than the neritic zone. The oceanic zone is divided into additional zones based on water depth.

- The **epipelagic zone** is the top 200 meters of water, or the depth to which enough sunlight can penetrate for photosynthesis. Most open ocean organisms are concentrated in this zone, including both plankton and nekton.
- The **mesopelagic zone** is between 200 and 1,000 meters below sea level. Some sunlight penetrates to this depth but not enough for photosynthesis. Organisms in this zone consume food drifting down from the epipelagic zone, or they prey upon other organisms in their own zone. Some organisms are detritivores, which consume dead organisms and organic debris as they drift down through the water.
- The **bathypelagic zone** is between 1,000 and 4,000 meters below sea level. No sunlight penetrates below 1,000 meters, so this zone is completely dark. Most organisms in this zone either consume dead organisms drifting down from above or prey upon other animals in their own zone. There are fewer organisms and less biomass here than in higher zones. Some animals are bioluminescent, which means they can give off light. This is an adaptation to the total darkness.
- The **abyssopelagic zone** is between 4,000 and 6,000 meters below sea level and is completely dark. It has low biomass and low species diversity.
- The **hadopelagic zone** is found in the water of deep ocean trenches below 6,000 meters. It is totally dark and has very low biomass and very low species diversity.

Questions

1. Describe a neritic biome.

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2. Why do oceanic biomes generally have a lower density of organisms than neritic biomes?

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3. Why are most open ocean organisms found in the epipelagic zone?

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4. Name three oceanic biomes that are located in the aphotic zone.

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5. What types of organisms are found in aphotic ocean biomes?

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Lesson 16.3: Multiple Choice

Name _____ Class _____ Date _____

Circle the letter of the correct choice.

- a. Deep ocean water may contain more nutrients than surface water due to
 - a. decomposition of marine organisms.
 - b. photosynthesis by photic organisms.
 - c. runoff from nearby land.
 - d. turnover of deep ocean water.
- b. Plankton consists of
 - a. algae.
 - b. bacteria.
 - c. animals.
 - d. all of the above.
- c. In ocean zones deeper than 200 meters, most organisms are
 - a. consumers.
 - b. producers.
 - c. phytoplankton.
 - d. zooplankton.
- d. How do organisms in the hadal zone of the ocean make food?
 - a. photosynthesis
 - b. chemosynthesis
 - c. decomposition
 - d. predation
- e. Based on the availability of sunlight, lakes are divided into the littoral zone, limnetic zone, profundal zone, and
 - a. intertidal zone.
 - b. benthic zone.
 - c. pelagic zone.
 - d. epipelagic zone.
- f. Compared with lakes that have low nutrient levels, lakes that have high nutrient levels have
 - a. higher productivity.
 - b. clearer water.
 - c. lower biodiversity.
 - d. more dissolved oxygen.
- g. Any area that is saturated or covered by water for a least one season of the year is classified as a
 - a. wetland.
 - b. riparian zone.
 - c. littoral zone.
 - d. coral reef.

Lesson 16.3: Vocabulary

Name_____ Class_____ Date_____

Match the vocabulary term with the correct definition.

Term

- ____ 1. abyssal zone
- ____ 2. aphotic zone
- ____ 3. bathyal zone
- ____ 4. benthic zone
- ____ 5. hadal zone
- ____ 6. intertidal zone
- ____ 7. littoral zone
- ____ 8. mesopelagic zone
- ____ 9. neritic zone
- ____ 10. riparian zone

Definition

- a. part of the ocean floor that makes up the continental slope
- b. narrow strip along the coastline of the ocean that is exposed to air at low tide
- c. part of the ocean floor that is under the deep ocean
- d. part of the pelagic zone over the continental shelf
- e. bottom surface of the ocean or a lake
- f. water between 200 and 1,000 meters below sea level in the oceanic zone
- g. interface between running freshwater and land
- h. deep water where too little sunlight penetrates for photosynthesis to occur
- i. part of the ocean floor that is in deep ocean trenches
- j. shallow water near the shore of a lake or the ocean

1.4 Community Interactions

Lesson 16.4: True or False

Name _____ Class _____ Date _____

Write true if the statement is true and false if the statement is false.

- _____ 1. Species interact in the same basic ways in all biomes.
- _____ 2. Types of community interactions include symbiosis.
- _____ 3. Predation always involves one animal consuming another animal.
- _____ 4. If the population of a prey species increases, the population of its predator is likely to decrease.
- _____ 5. Some prey species have adaptations that make them more visible to predators.
- _____ 6. Interspecific competition always leads to the extinction of one of the species.
- _____ 7. Predation is an example of a symbiotic relationship.
- _____ 8. A mosquito and the animal from which it takes blood have a mutualistic relationship.
- _____ 9. Many plants and fungi are parasitic during some stages of their life cycle.
- _____ 10. The species that is harmed in a parasitic relationship is called the host.
- _____ 11. Most ecosystems are stable and unchanging.
- _____ 12. Primary succession usually occurs faster than secondary succession.

Lesson 16.4: Critical Reading

Name _____ Class _____ Date _____

Read this passage from the lesson and answer the questions that follow.

Symbiotic Relationships

Symbiosis is a close association between two species in which at least one species benefits. For the other species, the outcome of the association may be positive, negative, or neutral. There are three basic types of symbiotic relationships: mutualism, commensalism, and parasitism. The rest of this passage describes mutualism and commensalism.

Mutualism

Mutualism is a symbiotic relationship in which both species benefit. Lichen is a good example. A lichen is not a single organism but a fungus and an alga. The fungus absorbs water from air and minerals from rock or soil. The alga uses the water and minerals to make food for itself and the fungus. Another example involves goby fish and shrimp. The nearly blind shrimp and the fish spend most of their time together. The shrimp maintains a burrow in the sand in which both the goby and the shrimp live. When a predator comes near, the fish touches the shrimp with its tail as a warning. Then, both fish and shrimp retreat to the burrow until the predator is gone. Each gains from this mutualistic relationship: the shrimp gets a warning of approaching danger, and the fish gets a safe home and a

place to lay its eggs. Co-evolution often occurs in species involved in mutualistic relationships. Many examples are provided by flowering plants and the species that pollinate them. Plants have evolved flowers with traits that promote pollination by particular species. Pollinator species, in turn, have evolved traits that help them obtain pollen or nectar from certain species of flowers. For example, some plants with tube-shaped flowers co-evolved with hummingbirds. The birds evolved long, narrow beaks that allowed them to sip nectar from the tubular blooms.

Commensalism

Commensalism is a symbiotic relationship in which one species benefits while the other species is not affected. In commensalism, one animal typically uses another for a purpose other than food. For example, mites attach themselves to larger flying insects to get a “free ride,” and hermit crabs use the shells of dead snails for shelter. Co-evolution explains some commensal relationships. An example is the human species and some of the species of bacteria that live inside humans. Through natural selection, many species of bacteria have evolved the ability to live inside the human body without harming it.

Questions

1. Define symbiosis, and name types of symbiotic relationships.

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2. Explain why lichen is an example of mutualism.

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3. Describe an example of co-evolution in a mutualistic relationship.

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4. How is commensalism different from mutualism?

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5. Describe an example of commensalism involving humans.

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-

Lesson 16.4: Multiple Choice

Name _____ Class _____ Date _____

Circle the letter of the correct choice.

- a. The focus of species interactions is the

- a. biome.
 - b. climate zone.
 - c. community.
 - d. individual.
- b. Camouflage is an adaptation to predation that occurs in
- a. prey species only.
 - b. predator species only.
 - c. both prey and predator species.
 - d. animal species only.
- c. Which sentence is true about all symbiotic relationships?
- a. Both species always benefit.
 - b. At least one species always benefits.
 - c. One species is always harmed.
 - d. Neither species is ever harmed.
- d. A hermit crab uses the shell of a dead snail for shelter. This is an example of a
- a. mutualistic relationship.
 - b. commensal relationship.
 - c. predator-prey relationship.
 - d. parasite-host relationship.
- e. Whole communities change through time in the process of ecological
- a. symbiosis.
 - b. succession.
 - c. competition.
 - d. evolution.
- f. Secondary succession occurs where
- a. the soil is already in place.
 - b. organisms have never lived.
 - c. there is nothing but bare rock.
 - d. lava has hardened into rock.
- g. The final stage of ecological succession is called a(n)
- a. successional community.
 - b. secondary community.
 - c. pioneer community.
 - d. climax community.

Lesson 16.4: Vocabulary

Name _____ Class _____ Date _____

Match the vocabulary term with the correct definition.

Term

____ 1. commensalism

____ 2. competition

____ 3. intraspecific competition

- ____ 4. interspecific competition
- ____ 5. mutualism
- ____ 6. parasitism
- ____ 7. predation
- ____ 8. primary succession
- ____ 9. secondary succession
- ____ 10. symbiosis

Definition

- a. relationship between organisms that strive for the same limited resources
- b. ecological succession that occurs in an area that has never been colonized
- c. symbiotic relationship in which one species benefits and one species is harmed
- d. symbiotic relationship in which one species benefits and one species is not affected
- e. competition between members of the same species
- f. any close association between two species in which at least one species benefits
- g. ecological succession that occurs in a formerly inhabited area that was disturbed
- h. symbiotic relationship in which both species benefit
- i. relationship in which members of one species consume members of another species
- j. competition between members of different species