Chapter 6 Notes

Section 1

Objectives

- **Describe** how plants determine the name of a biome.
- **Explain** how temperature and precipitation determine which plants grow in an area.
- **Explain** how latitude and altitude affect which plants grow in an area.

What is a Biome?

- Biomes are large regions characterized by a specific type of _____ and certain types of _____ and _____ communities.
- Each biome is made up of many individual ecosystems.

Biomes and Vegetation

- Biomes are described by their vegetation because plants that grow in an area determine _____
- Plants in a particular biome have characteristics, specialized structures, or _____ that allow the plants to survive in that biome.
- These adaptations include size, shape, and color. For example, plants in the _____ tend to be short because they cannot obtain enough _____ to grow larger.

Biomes and Climate

- **Climate** is the average weather conditions in an area over a _____.
- Climate is the _____ in determining which plants can grow in a certain area, which in turn defines the biome.
- Temperature and _____ are the two most important factors that determine a region's climate.

Temperature and Precipitation

- Most organisms are adapted to live within a particular range of temperatures and _____ at temperatures too far above or below their range.
- Precipitation also limits the organisms that can be found in a biome because all organisms need water, and the bigger the animal, _____.
- Biomes that do not receive enough rainfall to support large trees support communities dominated by small trees, shrubs, and grasses.
- In biomes where rainfall is not frequent, the vegetation is mostly _____ and desert

shrubs. In extreme cases, lack of rainfall results in _____, no matter what the temperature is.

- The higher the temperature and precipitation are, the _____ and _____ the vegetation is.

Latitude and Altitude

- **Latitude** is the distance north or south from the equator, and is expressed in degrees.
- **Altitude** is the height of an object above a _____, such as sea level or the Earth's surface.
- _____ varies with latitude and altitude.
- For example, climate gets _____ as latitude and altitude _____. This is why it gets colder as you move further up a mountain.
- As latitude and altitude increase, biomes and vegetation _____.
- Trees of tropical rainforests usually grow closer to the _____, while mosses and lichen of the tundra grow closer to the _____.
- The temperate region includes biomes such as temperate forests and grasslands, which usually have _____ temperatures and _____ that is ideal for agriculture.

Section 2

Objectives

- **List** three characteristics of tropical rain forests.
- **Name** and describe the main layers of a tropical rain forest.
- **Describe** one plant in a temperate deciduous forest and an adaptation that helps the plant survive.
- **Describe** one adaptation that may help an animal survive in the taiga.
- **Name** two threats to the world's forest biomes.

Forest Biomes

- Of all the biomes in the world, forest biomes are the most _____ and the most _____.
- The large trees of forests need a lot of water, so forests can be found where temperatures are mild to hot and where _____.
- There are three main forest biomes of the world: tropical, temperate, and _____.

Tropical Rain Forests

- **Tropical rain forests** are forests or jungles near the equator. They are characterized by large amounts of _____ and little variation in _____ and contain the greatest known _____ of organisms on Earth.
- They help regulate world climate and play vital roles in the nitrogen, oxygen, and carbon cycles.

- They are _____, warm, and get strong _____ which allows them to maintain a fairly constant temperature that is ideal for a wide variety of plants and animals.

Nutrients in Tropical Rain Forests

- Most nutrients are within the plants, not the _____.
- Decomposers on the rain-forest floor break down dead organisms and return the nutrients to the soil, but _____.
- Some trees in the tropical rain forest support _____ that feed on dead organic matter on the rain-forest floor. In this relationship, the fungi transfer the nutrients form the dead matter directly to the tree.
- Nutrients from dead organic matter are removed so _____ that runoff from rain forests is often as pure as _____.
- Most tropical soils that are cleared of plants for agriculture _____ and cannot support crops for more than a _____.
- Many of the trees form _____ called *buttresses* or *braces* that grow sideways from the tree to provide it with extra support in the thin soil.

Layers of the Rain Forest

- In tropical rain forests, different types of plants grow in different layers.
- There are _____ main layers of the rain forest:
    - The Emergent Layer
    - The Upper Canopy
    - The Lower Layer
    - The _____
- The **emergent layer** is the top foliage layer in a forest where the trees extend above surrounding trees.
- Trees in this layer grow and emerge into direct sunlight reaching heights of _____ m and can measure up to 5 m around.
- Animals such as _____, bats, monkeys, and snakes live in the emergent layer.
- The **canopy** is the layers of treetops that _____ the forest floor, and is considered to be the _____ layer of the rain forest.
- The tall trees, more than _____ m tall, form a dense layer that absorbs up to _____ percent of the sunlight.
- The canopy can be split into and upper and lower canopy with the lower canopy receiving less of the sunlight.
- **_____** are plants that use another plant for support but not for nourishment, and are located on high trees in the canopy.
- Growing on tall trees allows them to reach the sunlight needed for photosynthesis, and to absorb the water

and nutrients that run down the tree _____.

- Most animals that live in the rain forest live in the canopy because they depend on the abundant flowers and fruits that grow there.
- The _____ is the foliage layer that is beneath and shaded by the main canopy of a forest.
- Little light reaches this layer allowing only trees and shrubs _____ to grow there.
- Most plants in the understory do not grow more that _____ m tall.
- Herbs with _____ that grow on the forest floor capture the small amount of light that penetrates the understory.

Species Diversity

- The _____ of rain-forest vegetation has led to the _____ of a diverse community of animals.
- Most rainforest animals are _____ that use specific resources in particular ways to avoid _____ and have adapted amazing ways to capture prey and avoid predators.
- Insects use _____ to avoid predators and may be shaped like leaves or twigs.

Threats to Rain Forests

- Every _____ of every day, _____ acres of tropical rainforest are cleared for logging operations, agriculture, and oil exploration. _____ robs the rain forests of rare and valuable plant and animal species only found there.
- Habitat destruction occurs when land inhabited by an organism is _____ or altered.
- If the habitat that an organism depends on is destroyed, the organism is at risk of disappearing.
- An estimated _____ million native peoples live in tropical rain forests and are also threatened by habitat destruction.
- Because they obtain nearly everything they need form the forest, the loss of their habitat could force them to leave their homes and move into cities.
- This drastic change of lifestyle may then cause the native peoples too lose their _____ and _____.

Temperate Forests

- **Temperate rain forests** are forests communities that are characterized by _____, humid weather and _____ rainfall, where tree branches are draped with _____, tree trunks are covered with lichens, and the forest floor is covered with ferns.
- They occur in North America, Australia, and New Zealand, and are dominated by _____ trees such as the Douglas fir and Sitka spruce.

- Although located north of most other rain forests, the temperate rain forest of the _____ still maintains a moderate temperature year round.

- It rarely _____ because the nearby Pacific Ocean waters keep temperatures _____ by blowing cool ocean water over the forest.

- As the ocean winds meet the costal Olympic Mountains, a large amount of rainfall is produced which keeps the temperature cool and moist.

Temperate Deciduous Forests

- **Temperate deciduous forests** are forests characterized by trees that _____ in the fall, and are located between 30º and 50º north latitude.

- The range of temperatures can be _____, with summer temperatures soaring to 35ºC and winter temperatures often falling below freezing.

- They receive _____ cm of precipitation annually which helps to decompose dead organic matter contributing to the rich soils of the forest.

Plants of Deciduous Forests

- Plants in the deciduous forests grow in _____ with tall trees, such as birch, dominating the canopy while shrubs cover the understory. Also, more _____ reaches deciduous forest floors than rain forests floors allowing more plants to grow.

- Temperate-forest plants are adapted to survive _____. In the fall and winter, trees shed their leaves and seeds go _____ under the insulation of the soil. With the returning warmth in the spring, the trees grow new leaves and seeds _____.

Animals of Deciduous Forests

- The animals of temperate deciduous forests are adapted to use the _____ for both food and shelter.

- _____ cannot survive the harsh winter of the deciduous forests so each fall they fly south for warmer weather and better availability of _____.

- Other animals, such as mammals and insects, _____ so that they do not need as much food for energy, enabling them to survive the winter.

Taiga

- The **taiga** is the region of _____, coniferous forest below the arctic and subarctic tundra regions.

- The taiga has _____ winters and little _____.

- The growing season can be as short as _____ days with most plant growth occurring during the summer months because of nearly constant daylight and larger amounts of precipitation.

Plants of the Taiga

- A **conifer** is a tree that has seeds that develop in _____. Their leaves' arrow shape and _____

coating helps them to retain water in the winter. The conifer's shape also helps the tree shed _____ to the ground and not get weighed down.

- Conifer needles contains substances that make the soil _____ when they fall to the ground preventing plants from growing on the floor.

- Also, soil forms slowly in the taiga because the climate and acidity _____.

Animals of the Taiga

- The taiga has many _____ and swamps that in the summer attract birds that feed on insects.
- To avoid the harsh winters, birds migrate, while some year round residents, such as shrews,

  _____ for better insulation.

- Other animals, such as _____, have adapted to avoid predation by shedding their brown summer fur and growing white fur that camouflages them in the winter snow.

Section 3

Objectives

- **Describe** the difference between tropical and temperate grasslands.
- **Describe** the climate in a chaparral biome.
- **Describe** two desert animals and the adaptations that help them survive.
- **Describe** one threat to the tundra biome.

Grassland, Desert, and Tundra Biomes

- In climates that have less _____, forest biomes are replaced by _____, grassland, and chaparral biomes.
- As even less rain falls in these biomes, they change into _____ and _____ biomes.
- As precipitation decreases in an area, the diversity of the species in the area also decreases. But, the number of individuals of each species present may still be very large.

Savannas

- **Savannas** are _____ full of grasses and scattered trees and shrubs that are found in _____ and subtropical habitats. Found mainly in regions with a _____ climate, such as East Africa and western India.
- Although savannas receive little precipitation throughout the year, they do have a _____ season and a _____ season.
- Many animals are only active during the _____ season. _____ help to restore _____ to the soil during the dry season.

Plants of the Savanna

- Because most of the rain falls during the wet season, plants must be able to _____ prolonged periods without water.
- Some plants have large horizontal root systems to help them survive the dry season. These roots also enable the plant to _____ after a fire.
- The grasses also have coarse vertical leaves that expose less surface area to help _____, while some trees shed their leaves. Almost all have _____ for protection from herbivores.

Animals of the Savanna

- Grazing herbivores, like the elephant, have adopted _____ ways of life, following the rains to areas of new grass and fresh _____. _____ often stalk these animals for food.
- Many savanna animals give birth only during the _____ season, when food is _____ and the young are more likely to survive.

- Some species of herbivores reduce competition for food by eating vegetation at different heights than other species do.

Temperate Grasslands

- **Temperate grasslands** are communities (or biomes) that are dominated by grasses, have few trees, and are characterized by _____ summers and _____ winters, with rainfall that is _____ between that of a forest and a desert.
- Temperate grasslands have the most _____ of any biome. Few natural temperate grasslands remain because many have been replaced by _____ areas and _____ growing crops such as corn, soybeans, and wheat.
- Temperate grasslands are located on the interiors of continents where too little rain falls for _____ to grow and include the prairies of North America.
- _____ often play a crucial role in maintaining grasslands as _____ from the west are blocked. However, rainfall does increase as you move eastward, allowing _____ grasses to grow.
- Heavy precipitation is rare in the grasslands, allowing the hot temperatures in the summer to make the grasslands susceptible to _____.

Plants of Temperate Grasslands

- The root system of prairie grasses form _____ layers that survive drought and fire allowing the plants to _____ year after year.
- Few trees survive on the grasslands because of the lack of rainfall, fire, and the constant _____.
- The amount of rainfall in the area determines the types of plants that will grow in that area with varying root depth and grass height.

Animals of Temperate Grasslands

- Some grazing animals, such as the _____ and pronghorn antelope, have large, flat _____ for chewing the coarse prairie grasses.
- Other grasslands animals, such as _____, owls, and badgers, live protected in underground _____ that protect them from predators on the open grasslands.

Threats to Temperate Grasslands

- Farming and overgrazing have changed the grasslands.
- Grains crops cannot hold the soil in place as well as native grasses can because the roots of crops are shallow, so soil erosion eventually occurs.
- Erosion is also caused as the grasses are constantly eaten and trampled.
- Constant use can change the fruitful grasslands into desertlike biomes.

Chaparral

- **Chaparral** is a type of temperate _____ biome with vegetation that includes _____ leafed evergreen shrubs and is located in areas with hot, dry summers and _____, wet winters.
- Chaparrals are located in the _____ latitudes, about 30° north and south of the equator.
- Chaparrals are located primarily in _____ areas that have Mediterranean climates.

Plants of the Chaparral

- Most chaparral plants are low-lying, _____ shrubs and small trees that tend to grow in dense patches and include chamise, manzanita, scrub oak, and herbs like sage and bay.
- These plants have small, _____ leaves that contain _____ that promote burning, allowing natural fires to destroy competing trees.
- Chaparral plants are well adapted to _____ and can resprout from small bits of _____ plant tissue.

Animals of the Chaparral

- A common adaptation of chaparral animals is _____, shape or coloring that allows an animal to blend into its environment.
- Animals such as _____, lizards, chipmunks, and mule deer have a brownish gray coloring that lets them move through the brush without _____.

Threats to the Chaparral

- Worldwide, the greatest threat to chaparral is _____.
- Humans tend to develop lands of the chaparral for commercial and residential use because these biomes get a lot of _____, are near the _____, and have a _____ climate year round.

Deserts

- **Deserts** are regions that have little or no _____, long periods without rain, and extreme temperatures.
- Although there are hot and cold deserts, one characteristic they both share is the fact that they are the _____ places on Earth.
- Deserts are often located near large mountain ranges because mountains can block the passage of moisture-filled clouds, limiting precipitation.

Plants of the Desert

- All desert plants have adaptations for obtaining and conserving water, which allows the plants to live in dry, desert conditions.
- Plants called _____, such as cactuses, have thick, fleshy _____ and leaves that conserve water. Their leaves also have a _____ coating to prevent water loss, while sharp spines on the plant keep animals away.
- Many plant roots _____ just under the surface to absorb as much rain as possible.
- Some plants are adapted to survive for long periods of time without water.
- When conditions are too dry, these plants _____ and drop their _____ that stay dormant until the next rainfall. Then, new plants quickly _____, grow, and bloom before the soil becomes dry again.
- These plants can survive their water content dropping to as low as _____ percent of their mass.

Animals of the Desert

- Animals of the desert have adapted many different ways to prevent water loss.
- Reptiles have thick, _____ that prevents water loss. Amphibians survive by _____, or burying themselves in the ground and _____ through the dry season. Insects are covered with body armor that helps them retain water.
- In addition, most desert animals are _____, meaning they are active mainly at night or dusk when it is cooler.

Tundra

- The **tundra** is a _____ plain that is located in the _____ or Antarctic and that is characterized by very low winter temperatures, short, cool summers, and vegetation that consists of grasses, lichens, and _____ herbs.
- Summers are short in the tundra, so only the top few centimeters of soil _____.
- **_____** is the permanently frozen layer of soil or subsoil and can be found in the tundra regions.

Vegetation of the Tundra

- Mosses and lichens, which can grow without soil, cover vast areas of rocks in the tundra.
- The soil is thin, so plants have wide shallow roots to help anchor them against the icy winds.
- Most flowering plants are short, which keeps them out of the wind and helps them absorb heat from the sunlit soil. Woody plants and perennials have evolved dwarf forms that grow flat along the ground.

Animals of the Tundra

- Millions of _____ birds fly to the tundra to _____ in the summer when food is abundant.
- _____ migrate throughout the tundra in search of food and water. Hunters such as wolves prey on migratory caribou, deer, and moose.
- _____ stay active, but burrow underground to avoid the cold. Other year-round residents, such as arctic foxes, lose their _____ summer coat for white fur that camouflages them with the snow.

Threats to the Tundra

- The tundra is one of the most _____ biomes on the planet. The food chains are relatively simple so they are easily disrupted.
- Until recently these areas have been undisturbed by humans. But _____ was located in parts of the tundra, and _____, extraction, and transport has disrupted many tundra habitats.
- Pollution caused by spills or leaks of oil and other toxic materials may also _____ the food and water sources of organisms of the tundra.