Ecosystems

Date:

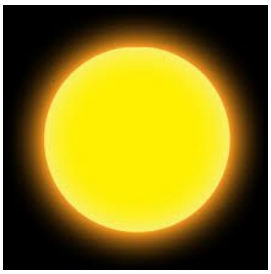
6.L.2 Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment.

6.L.2.1 Summarize how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within a food chain or food web (terrestrial and aquatic) from producers to consumers to decomposers.

6.L.2.2 Explain how plants respond to external stimuli (including dormancy and forms of tropism) to enhance survival in an environment.

6.L.2.3 Summarize how the abiotic factors (such as temperature, water, sunlight, and soil quality) of biomes (freshwater, marine, forest, grasslands, desert, Tundra) affect the ability of organisms to grow, survive and/or create their own food through photosynthesis.

Soak Up the Sun



How do organisms get energy and matter?

•_____ is the ability to do work.

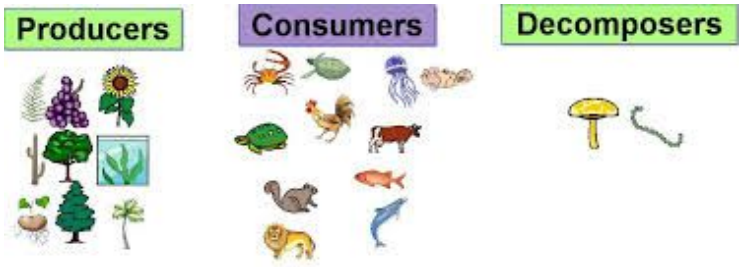
•_____ is anything that has mass and takes up space.

•___ organisms need _____ and matter to live, grow, and reproduce.

•The _____ is the _____ source of energy in most ecosystems.

•Organisms called _____ make their _____ food.

•_____ are organisms that cannot make their own food and _____ producers or other consumers to get energy.



•Most _____ get energy from the sun, but some use _____ energy instead of light energy to make food.

•Producers get matter from _____ and _____.

•Consumers get _____ energy and matter from the foods they _____.

What happens to energy and matter in ecosystems?

•The _____ states that energy cannot be created or destroyed; it only changes form.

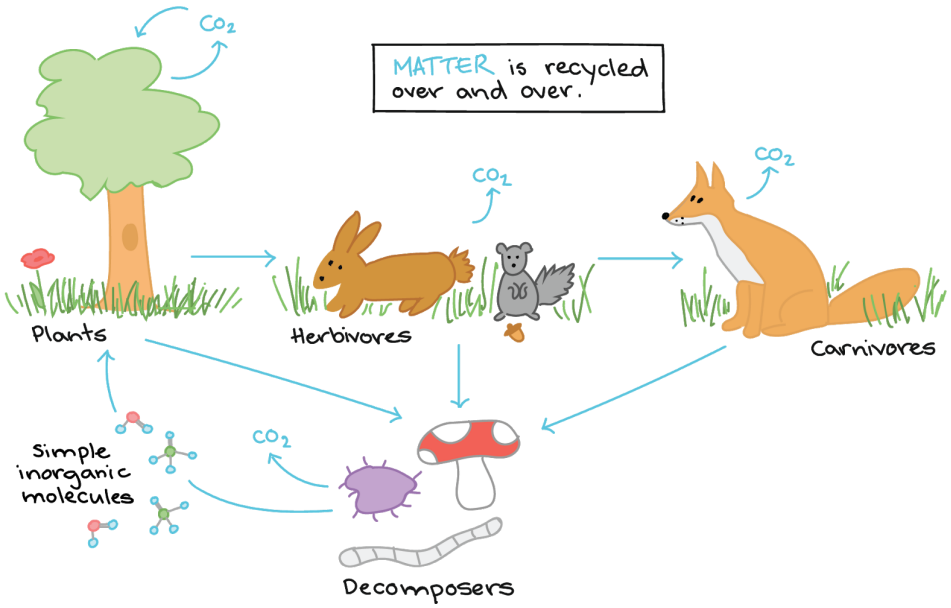
•The _____ states that mass cannot be created or destroyed.

•Matter _____ through the environment in _____ forms.

•Matter and energy can _____ an ecosystem when _____ move.

•Also, matter and energy can _____ an ecosystem in moving _____ and _____.

•Although matter and energy _____ and _____ an ecosystem, they are _____ destroyed.



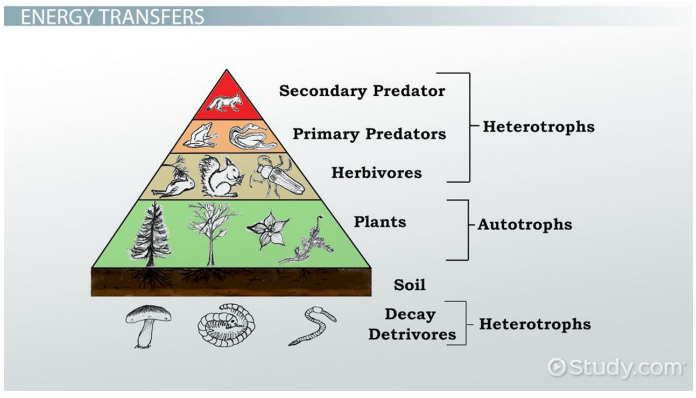
Cycle and Flow

How does energy move through an ecosystem?

•_____ enters most ecosystems as _____, which _____ use to make food.

•_____ consumers get energy by eating producers. _____ consumers get energy by eating primary consumers, and so on up the food chain.

•An organism uses _____ of the energy it takes in for life processes. Some energy is _____ as _____, and some is _____ in the organism's body.



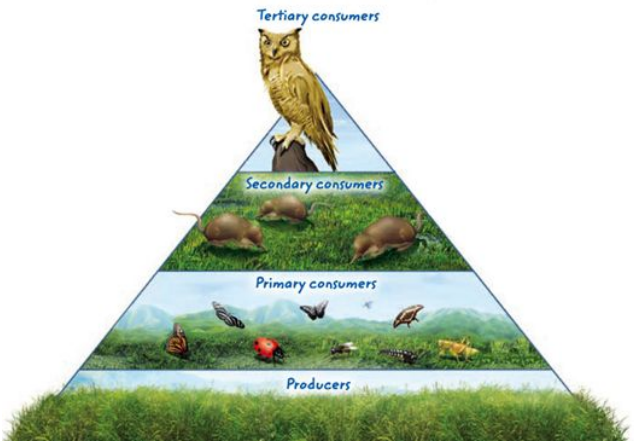
•An _____ is a tool that can be used to trace the flow of energy through an ecosystem.

•The _____ level, consisting of

producers, has the _____ population and the most energy. The other levels are consumers.

•Going _____ the pyramid, there is _____ energy and _____ organisms at each level. Consumers at the _____ level have the _____ population.

•How does the size of a population change at each step in an energy pyramid?



How does matter move through an ecosystem?

•Water _____ from Earth's surface, enters the atmosphere, becomes clouds, and falls back to Earth's surface.

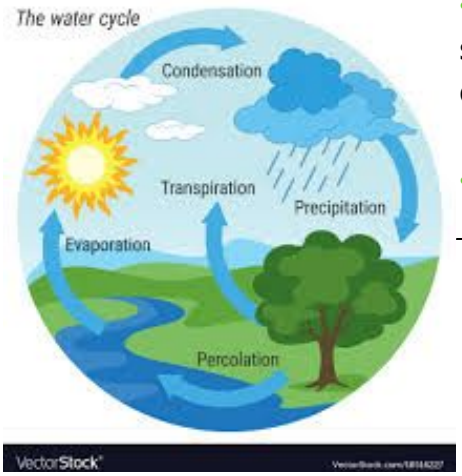
•Likewise, _____ and _____ cycle through an ecosystem, going from producers to consumers to decomposers and back to producers.

•Matter _____ some ecosystems and _____ other ecosystems. Because matter can enter and leave an ecosystem, it is called an _____ *system*.

What is the water cycle?

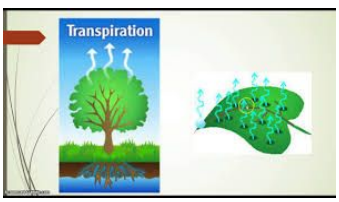
•The movement of water between the oceans, atmosphere, land, and living things is known as the _____.

•_____ can enter the _____ by evaporation, transpiration, and respiration.



•During _____, the sun's heat causes water to change from liquid to vapor.

•Plants release water vapor from their leaves in _____.



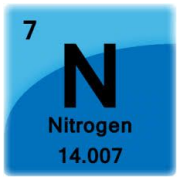
•Organisms release water as waste during _____.

•In _____, water vapor cools and returns to liquid. The water that falls from the atmosphere to the land and oceans is _____.

•The precipitation that falls on land and flows into streams and rivers is called _____.

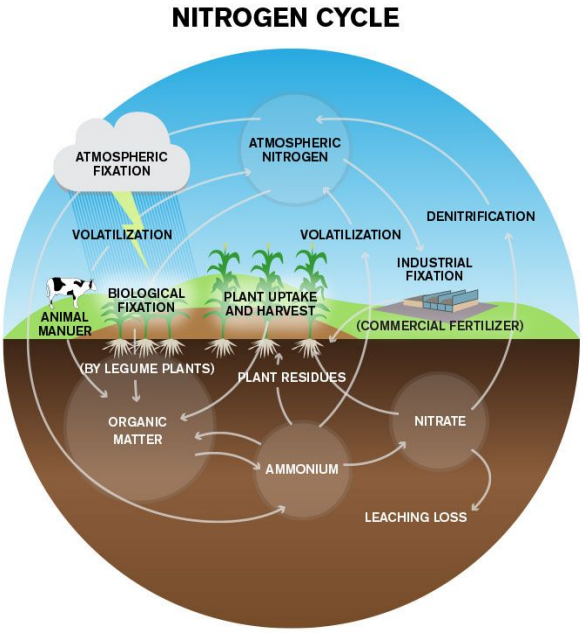
•The water that seeps into the ground and is stored underground is called _____. It will flow back into the soil, streams, rivers, and oceans.

What is the nitrogen cycle?



•The movement of nitrogen between the environment and living things is called the _____.

•_____ in the soil can change nitrogen gas from the air into forms that plants can use. This process is called _____.



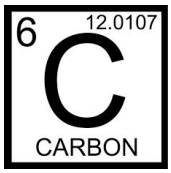
•_____ take in and use fixed nitrogen. _____ then get the nitrogen they need by eating plants or other organisms.

•When organisms die, _____ break down their remains and release a form of nitrogen into the soil that plants can use.

•Finally, certain types of _____ in the soil can _____ nitrogen into a gas, which is returned to the atmosphere.

What is the carbon cycle?

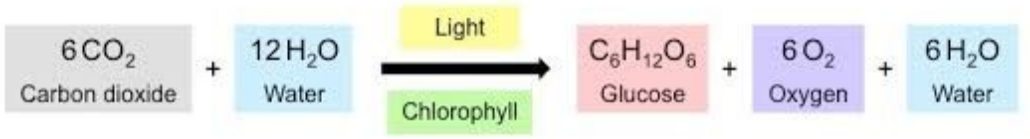
•_____ is an important building block of organisms.



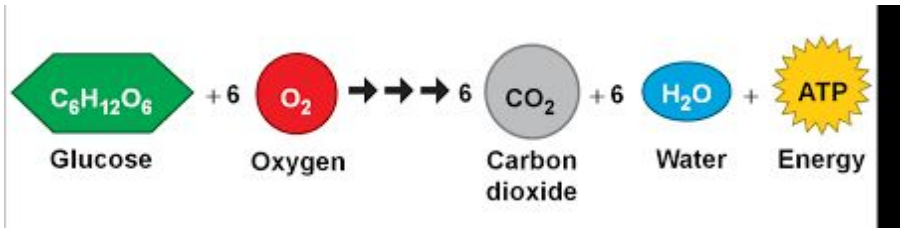
•Carbon is _____ in food, the atmosphere, water, rocks, soils, organisms, and fossil fuels.

•Carbon moves through organisms and between organisms and the physical environment in the _____.

•During _____, producers make sugars that contain carbon.



•During _____, sugars are broken down to release energy, carbon dioxide, and water.



•_____ is the burning of materials. The burning of once-living materials _____ carbon dioxide, water, heat, and other materials.

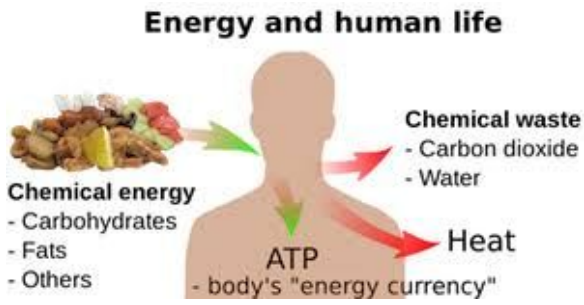
•_____ breaks down dead organisms and waste. Decomposers get energy from this material by respiration.

•Decomposition _____ carbon dioxide, water, and other nutrients to the environment.

Get Energized!

How do organisms get energy?

•____ living things need a source of _____ energy to survive.



•Chemical energy is _____ in the _____ of molecules and holds molecules together.

•The energy from _____ is the

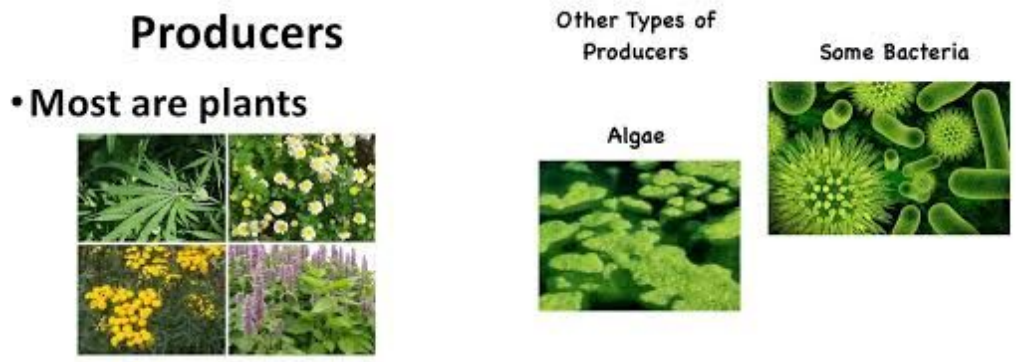
_____ energy in the _____ of food molecules.

•A _____, also called an autotroph, uses energy to make food.

•The food made by producers _____ the energy for other living things in an _____.

•Most producers _____ sunlight to make food through photosynthesis.

•_____ green plants, algae, and some bacteria are _____.



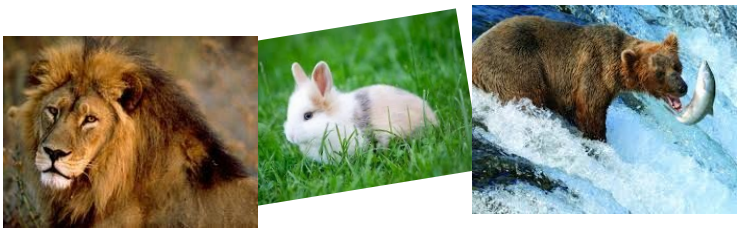
•An organism that gets energy and nutrients by breaking down the remains of other organisms is a _____.

•Decomposers are nature's _____. They move matter through the ecosystem.

•Decomposers _____ water and nutrients available to other organisms.

•A _____ is an organism that eats other organisms.

•Consumers must _____ other organisms for energy and nutrients.



•A consumer that eats only plants is called an _____.

•A _____ eats other animals.

•An _____ eats both plants and animals.

•A _____, such as a turkey vulture, is a specialized consumer that feeds on dead organisms.

Energy Transfer

How is energy transferred among organisms?

•If an organism is _____ or decomposes, the consumer or decomposer _____ in the energy _____ in the original organism.

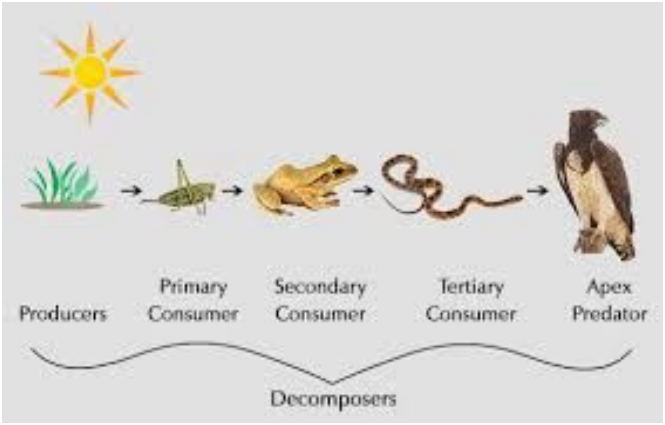
•_____ chemical energy that an organism has _____ in its _____ is available to consumers.

•In this way, _____ is _____ from organism to organism.

•A _____ is the path of energy transfer from producers to consumers.

•The _____ in a food chain represent the _____ of _____ from the body of the consumed organism to the body of the consumer of that organism.

•Producers form the _____ of food chains.



•Producers _____ energy to the first, or _____, consumer in the food chain.

•The _____ consumer consumes the primary consumer.

•A _____ consumer eats the secondary consumer.

•Finally, decomposers _____ matter back to the soil.

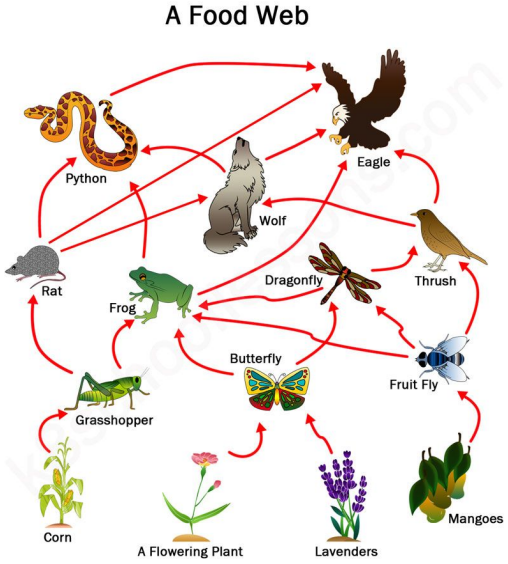
World Wide Webs

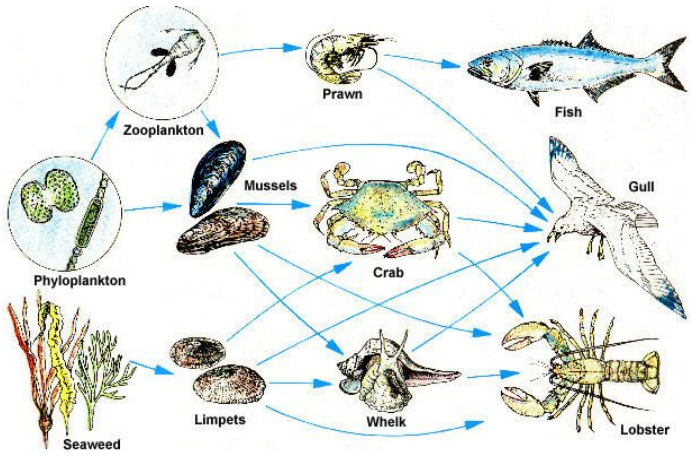
How do food webs show energy connections?

•In nature, energy and nutrient connections are more _____ than a simple food chain.

•A _____ is the feeding relationships among organisms in an ecosystem. Food webs are made up of _____ food chains.

•Many _____ energy paths lead from the producers to the top predators.





How are organisms connected by food webs?

•_____ living organisms are _____ by global food webs, which include webs that begin on _____ and webs that begin in the _____.

•Many organisms have feeding _____ that _____ the land- and water-based food webs.

•Because _____ food webs are connected, _____ even ___ organism can _____ many organisms in other _____.

Dangerous Competition

•_____ species often compete with native species for energy resources.

•The invasive kudzu plant outgrows native plants and can completely cover houses and cars.

•The _____ mussel and walking catfish are so successful that they often leave little food for native species.

The Web of Life

How are all living things connected?

•Organisms _____ energy and matter to live.

•_____ between organisms cause an _____ of energy and matter, creating a web of life.

•_____ is the study of how organisms interact with one another and with the environment.

•_____ individual organism has a _____ to play in the _____ of energy and matter.

•In this way, organisms are _____ to all other organisms, and their relationships _____ each one's _____ and survival.

•A _____ is an interaction between organisms in an area.

•_____ organisms rely on the _____ environment for survival.

•An _____ is a nonliving part of an environment, such as water, nutrients, soil, sunlight, rainfall, or temperature.

•Abiotic factors _____ where organisms can _____.

What determines where a population can live?

•_____ and _____ factors influence whether a species can live in a certain place.

•In general, ___populations _____ occupy exactly the same niche.

•Small _____ in habitats, roles, and adaptations can allow _____ species to live _____ in the same ecosystem.

•A population's _____ is the role the population plays in the ecosystem, such as how it gets food and interacts with other populations.

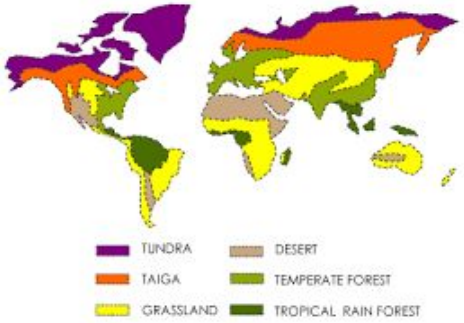
•A _____ is the place where an organism usually lives and is part of an organism's niche.

•The habitat must _____ all of the _____ that an organism needs to grow and survive.

Home Sweet Biome

What is a biome?

•A _____ is a region of Earth where the climate determines the types of plants that live there.



•The _____ of plants in a biome _____ the _____ of animals that live there.

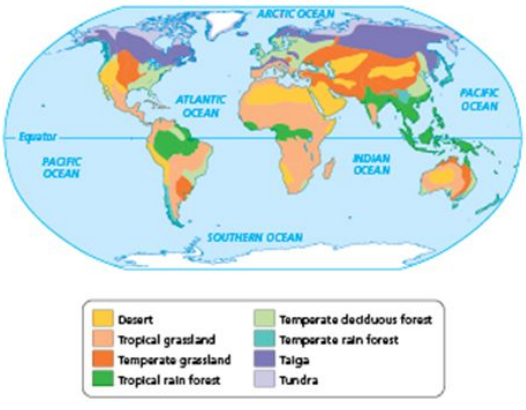
•Deserts, grasslands, tundra, taiga, temperate forests, and tropical forests are all types of _____.

What makes one biome different from another?

•_____ is the main _____ factor that characterizes a biome.

•Climate describes the _____-term _____ of temperature and precipitation in a _____.

•The _____ of a biome on Earth affects its climate. For example, biomes closer to the _____ have _____ climates, those closer to the _____ have _____ climates.



•Examine the distribution of Earth's major land biomes.

•Other _____ factors that characterize a biome include soil type, amount of sunlight,

and amount of water available.

•Abiotic factors _____ which organisms can live in a biome.

•_____ are features that allow organisms to survive and reproduce.

•_____ and _____ that live in a biome have adaptations to its _____ conditions.

•For example, animals in biomes that are _____ all year often grow _____ fur coats. Plants in biomes with seasonal temperature changes lose their leaves and become inactive in winter.

Life in a Biome

How are ecosystems related to biomes?

•Most biomes _____ across huge areas of land. Within each biome are _____ areas called ecosystems.

•Each _____ includes a specific community of organisms and their physical environment.

•A _____ forest biome can contain _____ or river ecosystems. A grassland biome can contain areas of small shrubs and trees.

What are the major land biomes?

•_____ has low average temperatures and very little precipitation. It is found in the Arctic and in high mountain regions.

•The ground contains _____, a thick layer of permanently frozen soil beneath the surface.

•The plants have _____ roots. Some animals develop thick fur, some migrate to warmer areas before winter, and some _____.

•_____, also called boreal forest, has low average temperatures, as in

the tundra biome, but more precipitation. Taiga biomes are found in Canada and northern Europe and Asia.

•Taiga plants include _____ **trees**, which are trees that have evergreen, needlelike leaves.

•_____ birds live in taiga in summer. Some animals live there year-round, and some undergo seasonal changes in fur color.

•_____ biomes are very dry. Some receive less than 8 centimeters (3 inches) of precipitation each year. Desert soil is rocky or sandy.

•Many deserts are _____ during the _____ and _____ at _____, although some have milder temperatures.

•Plants and animals in this biome have _____ that let them conserve water and survive _____ temperatures.

•A _____ is a biome that has grasses and few trees.

•_____ grasslands, such as the African _____, have high average temperatures throughout the year. They also have wet and dry seasons.

•Thin soils support grasses and some trees. _____ animals feed on the grasses, and predators hunt the grazing animals.

•_____ grasslands, such as the North American _____, have moderate precipitation, hot summers, and cold winters.

•These grasslands have deep, _____-rich soils. _____ fires sweep through the grasslands, but grasses and other nonwoody plants are _____ to fire.

•Bison, antelopes, _____ dogs, and _____ are common animals here.

•_____ deciduous forests have moderate precipitation, hot summers, and cold winters.

•This biome has _____ **trees**, which are broadleaf trees that drop their leaves as winter approaches.

•During winter, some animals _____, but others are _____ year-round. Many birds migrate to warmer areas before winter.

•_____ rainforests have a long, cool wet season and a relatively dry summer.

•There are many coniferous trees, and the forest floor is _____ with mosses and ferns. The soil is nutrient-rich and plants grow throughout the year.

•Animals include spotted _____, shrews, elk, and _____.

•_____ rainforests are located near Earth's _____. This biome is warm throughout the year, and it receives more rain than any other biome.

•The soil is _____ and nutrient-_____. Yet, these forests sustain dense layers of plants and some of the highest biological _____ on Earth.

•Birds, monkeys, and sloths live in the upper layers of the rainforest.

Leafcutter ants, jaguars, snakes, and anteaters live in the lower layers.

Splish Splash

What are the major types of aquatic ecosystems?

•An _____ *ecosystem* includes any water environment and the community of organisms that live there.

•The _____ in types of aquatic ecosystems are freshwater ecosystems, estuaries, and marine ecosystems.

What abiotic factors affect aquatic ecosystems?

•_____ factors are the _____ things in an environment.

•The major abiotic factors that _____ aquatic ecosystems include water _____, water _____, amount of _____, _____ level, water _____, _____, and _____ of water flow.

•An aquatic ecosystem may be _____ by some of these factors but not by others.

Where are examples of freshwater ecosystems found?

•_____ ecosystems contain water that has very little salt in it. They are found in lakes, ponds, wetlands, rivers, and streams.

•_____ and _____ are bodies of water surrounded by land.

•Some _____ grow at the edges of lakes and ponds. Others live underwater or grow leaves that float on the surface.

•Lakes and ponds contain _____, such as algae and amoebas, and the eggs and young of frogs and some insects.

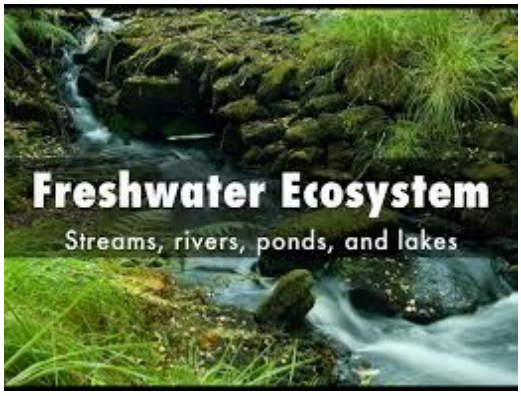
•Clams, _____, and worms live on the bottom of lakes and ponds and _____ down dead materials for food.

•Frogs, turtles, fish, and ducks have _____ that let them swim in lakes and ponds.

•A _____ is an area of land that is saturated, or soaked, with water for at least part of the year. Bogs, marshes, and swamps are types of wetlands.

•Wetlands have _____ species _____. Plants in wetlands can live in wet soil. Animals include ducks, frogs, shrews, herons, and alligators.

•Wetlands _____ and _____ water, removing some pollutants. They _____ nearby land and shore from floods and _____.



•Rivers and streams are _____ to many organisms, including fish, aquatic insects, and mosses.

•As the water _____, it interacts with air and _____ oxygen.

•_____ ecosystems in streams can have areas of fast-moving and slow-moving water, with organisms adapted to each area.

Where River Meets the Sea

What is an estuary?

•An _____ is a partially enclosed body of water formed where a river flows into an ocean.

•Because estuaries have a _____ of _____ water and _____ water, they support ecosystems that have a unique and diverse community of organisms.

•Seagrasses, mangrove trees, fish, oysters, mussels, and water birds all live in estuaries.