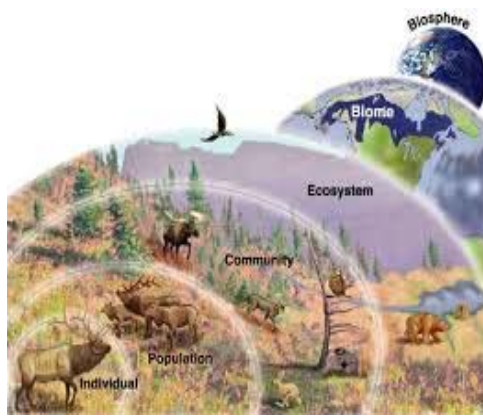
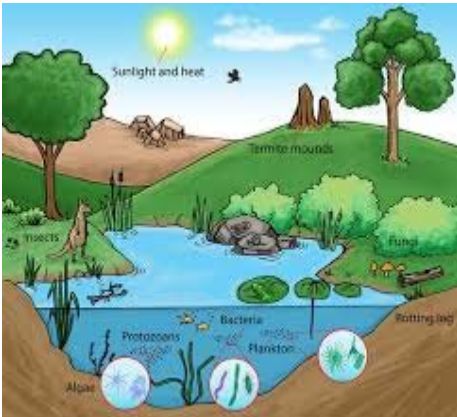


Ecology



Ecology is a science all by itself but it is also a branch of the larger sciences of biology and geography. Ecology is the study of organisms and the environments they live in. As an ecologist, you don't just study a fish. You study the fish, water, sunlight, food supply, things that eat the fish, and every possible factor that might affect the fish in its lifetime. Ecologists study specific areas of biological activity called ecosystems.

The details and complexities of ecosystems make ecology interesting. Ecologists first study all of the interactions inside of the ecosystem. They then apply the idea that no ecosystem (local environment) exists alone. Ecosystems interact with each other. That puddle is interacting with the vacant lot. The vacant lot interacts with the ecosystem of the city block, then the city, county, state, country, and continent. You get the idea.

You Should Be Moving

Nothing just sits around in nature. The locations studied in ecology are living things. They are constantly changing and moving. Not only do the animals move, but the things they need to survive move too. Energy moves. Nutrients and chemicals move. Everything either flows or cycles through an ecosystem, and it happens all the time. Twenty-four hours a day, bacteria work to get nitrogen ready for the plants. Plants grow and make food for animals. The Sun shines on the plants during the day and warms up the area. You need to remember that things are always happening. Even if you don't see it moving, it is.

Outside Factors

Do you think you control the environment around you? You know that you can't control the weather or the tides. However, you do have a huge influence over your local ecosystem and the world. The term biosphere is used to describe all of the ecosystems found across the world. They are all there, from the bottom of the ocean, to the Antarctic mountains. There are large factors that influence all of the ecosystems. The easy factors to remember are climates, seasons, and natural disasters.

Humans - The Largest Factor?

You affect the biosphere every day. Think about the people who still use coal to power generators in China. Did you know that they use so much coal that it goes into the atmosphere and floats around the entire world? It's like a huge band of pollution circling the Earth. Those people definitely affect the biosphere.

What about the farmer who uses a bunch of fertilizers? One person is just fertilizing his fields. All of those nutrients go into the soil, are washed away into the rivers, and finally make it to the ocean. Every step of that process changes the local ecosystem. When the fertilizer gets to the ocean, even more things may change. Let's say a huge number of bacteria grow on the extra nutrients. Those bacteria can make the fish sick and die. Eventually the bigger fish die because there is no food. Soon there are no fish to catch and over fishing happens somewhere else in the world. Do you see how one person can affect the entire planet?

Ecosystems



An Ecological System

The ecosystem of this oasis can be found in the middle of scrub desert. The word ecosystem is short for ecological systems. An ecosystem includes all of the living organisms in a specific area. These systems are the plants and animals interacting with their non-living environments (weather, Earth, Sun, soil, atmosphere). An ecosystem's development depends on the energy that moves in and out of that system. As far as the boundaries of an ecosystem, it depends upon how you use the term. You could have an entire ecosystem underneath a big rock. On the other hand, you could be talking about the overall ecosystem of the entire planet (biosphere).

An ecosystem can be as small as a puddle or as large as the Pacific Ocean. That ecosystem includes every living and non-living thing in the area. It is several small communities interacting with each other.

Let's look at a puddle example. You might start by looking at the temperature, depth, turbulence, sunlight, atmospheric pressure, weather patterns, wind, nutrients, etc. Those are just the non-living things in the ecosystem of a puddle. When you add on all the living interactions, you have a good idea how complex an ecosystem can be. Even a puddle is an amazing place.

Biomes

Scientists discuss some general ecosystem types. They call them biomes. A biome is a large area on the Earth's surface that is defined by the types of animals and plants living there. A biome can be partially defined by the local climate patterns. You may also have more than one type of biome within a larger climate zone. Here is a short list of possible biomes.

- Tropical Rainforest (Think about Brazil)
- Tropical Savanna (Think about Africa)
- Desert (Think about the Middle East)
- Mediterranean Woodland (Think about coniferous forests)
- Mid-latitude Grassland (Think about Oklahoma)
- Mid-latitude Deciduous Forest (Think about the east coast of North America)
- Tundra (Think about frozen plains of Alaska)
- Ice Caps (Think about the poles)

Biomes don't just start and stop when they border each other. They all have transition zones that have characteristics of both sides. That zone is like a blending of two biomes. Scientists call it an ecotone. Ecotones can happen at the edges of forests, deserts, and mountain ranges. They are often easy to see because one type of world (many trees) changes quickly into another type (the cliffs of a mountain). While an ecotone on the ground may not cover a large area of land, climate transition zones between biomes are often very large.

Land Biomes



Biomes are unique situations. They are very specialized ecosystems that only exist in certain parts of the world. They are ecosystems that are defined by their environments. Factors like temperature, rainfall, and altitude all decide what type of life a biome can support. While you're here, take a walk through a few different biomes.

Hot and Wet

Tropical rain forests are warm and humid. Standing on the ground, you can look up and see a huge canopy of leaves above you. The trees are very tall, some fifty feet high. Even though the Sun is shining, you still walk around in the shade. As you walk through this biome, you see loads of different living creatures. There are lots of birds, some tiny mammals, but most of all insects. There are bugs everywhere! They crawl, fly, and jump all around you. As you continue walking, you notice all of the dead leaves on the ground. Every now and then a leaf falls from above and adds to the pile.

Dry and Hot

Imagine you are now in the desert. It's not just hot; it's incredibly hot and dry here. Your lips are chapped and you are very thirsty. The ground is all cracked and it may have been over a year since it rained. You see cacti (if it's one it's a cactus) and a bird every now and then. There are no trees at all. There are a few dried up bushes and a couple of insects on the ground. After the Sun goes down you notice all sorts of animals coming out of the ground. When it cools off, the burrowing animals come out to hunt the bugs. It's just too hot during the day.

Cold and Colder

Life in the tundra is just as hard as life in the desert. You usually find tundra biomes in the far north. If you came in the winter, it would be dark all of the time. In the summer, the Sun barely sets. Even with all the light there is still very little life. You see a lot of lichen and mosses on the rocks, if you can even see the rocks under the snow. There are no trees. It wouldn't matter anyway; the roots couldn't go deep because the soil is frozen (a state called permafrost).