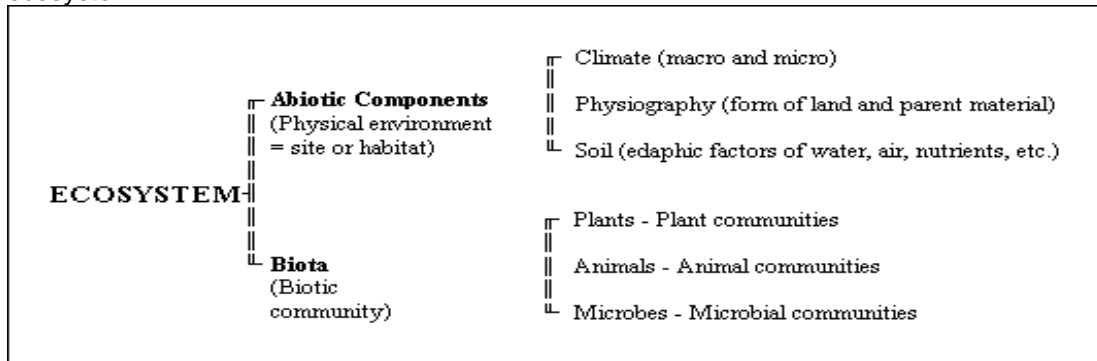


1.0 Relationships exist between living things and their environments

1.1 Defining an Ecosystem and Learning about Basic Needs

Ecology is the study of the relationship between living organisms and their environment. An ecologist is someone who studies those relationships. An ecosystem is a place, such as a rotting log, a forest, or even a schoolyard, where interactions between living and non-living things occur. All living organisms and non-living parts within this place are interacting all the time and adjustments must occur if the organisms are to survive. Living organisms make up the biotic components of the ecosystem, while non-living things make up the abiotic parts of the same ecosystem.

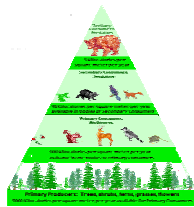


Ecosystems vary in size and complexity. In order to study an entire ecosystem, ecologists often study only a small aspect of an ecosystem and then work with other ecologists to piece together the overall picture of how the ecosystem functions.

- **The World Within An Ecosystem**

Species within an ecosystem refers to those living things that can reproduce and have young that can also reproduce. When there are a number of individuals of the same species within an ecosystem the group is called a **population**. All the populations of the many different species that live and interact together in the same ecosystem is referred to as **community**.

- **The Needs of Living Things**



Living things need food.



Living things need a suitable habitat.



Living things need water.



Living things exchange gases.

Living things are always interacting with each other and with the non-living things in their environment.

1.2 Interactions among Living Things

- **Symbiotic Relationships**

When two species live closely together in a relationship that lasts over time symbiosis occurs. There are three forms of symbiosis:

- **Mutualism**

Mutualism occurs when there is a relationship between two different organisms, in which each partner benefits from the relationship. Examples include:

Mutualism
between plants
and their
herbivores



3-way Mutualism between an ant,
a butterfly caterpillar, and an
acacia plant



- **Parasitism**

Parasitism occurs when there is a relationship between two different organisms, in which one partner benefits from the relationship, while the other partner is harmed. Typically, the partner that benefits (the **parasite**), lives on or in the other organism (the **host**), and feeds on it. Examples include:

Aphid mummy - the
result of parasitism



A *Kalahari barking
gecko* is crucified by a
Shrik.
They store them as a
cache for a later meal.



- **Commensalism**

Commensalism occurs when there is a relationship between two different organisms, in which one partner benefits from the relationship, while the other neither benefits, nor is harmed. Examples include:

Anemonefishes
dwell among the
tentacles of
*Tropical Sea
Anemones*



*Insects and
Flowers*



Both partners apparently benefit from the relationship,

- **Adaptating To The Environment**

Living things are adapted, so they **'fit'** into their surroundings, to ensure survival. An **adaptation** is an **inherited** characteristic that helps an organism survive and reproduce in its environment. Sometimes adaptations are **learned** during the organism's lifetime.

1.3 Human Impacts on Ecosystems

Symbiotic relationships are only a few ways that organisms interact with one another within an ecosystem. Other interactions may involve the physical changing of the ecosystem by the organisms living in it and interacting with parts of it. **Natural Resources** are the materials and products found in nature that people use to meet their basic needs. The impact that people have on the use of resources can be very small, or can be huge, and can lead to positive or negative consequences. The needs of all living things now have to be met with the available natural resources. How we are able to satisfy these needs with minimal conflict will determine how resourceful we can be.

- ***Declining Beaver Population***

When a family of beavers makes a dam, the stream below the dam dries up, killing the water organisms that need the water to survive. Above the dam, a pond changes the habitat and limits the kinds of organisms that can survive there. For every action in an ecosystem there is a resulting effect and reaction which will change the make-up of the ecosystem in some way. The decline in the beaver population in Yoho National Park has been as a result of improved firefighting equipment and fire-monitoring techniques. Young Aspen trees (the beavers preferred source of food and shelter) are scarce and the other trees in the forest are growing too large for the beavers to use effectively.

- ***Dealing With our Garbage***

The ways people interact with the environment has changed over time. Machines and advanced technologies have caused a higher impact than in the past. All of the needs people had in the past were satisfied by the natural resources they were able to find in the environment around them. Nowadays, resources are transported throughout the world, as the demand gets higher. Lifestyle changes over time have increased the pressure on different environments and the ecosystems we live in.

Needs are basic to survival, whereas, ' **wants** ' are things that just make survival more comfortable or enjoyable. Each time a need or a want is satisfied, natural resources or energy are used up. This impacts the environment we live in. Transporting food from all around the world, just so we can have the luxury of choice impacts other regions as well, because those regions had to clear land, use fuel (energy) and through the industrial processes caused pollutants to enter the air. When our 'want' demands conflict with the health of our ecosystems, we need to begin making some more responsible choices. The needs of wildlife can be negatively impacted by the wants of people. When this happens we need to decide whether our want is more important than their need.

- ***The Garbage Solutions***

The production of wastes on our planet is increasing. The storage or disposal of these wastes - until they can be returned naturally back to the environment is a major problem. Waste disposal techniques include recycling, composting, incinerating, and hazardous waste operations.

Sanitary landfills are similar to landfills, where waste is spread over a large area and then covered with soil to encourage the natural decomposition of the waste. To prevent and control leaking of hazardous products from the sanitary landfills, a clay liner and a system of drainage pipes is put into place.