

The Natural Environment.

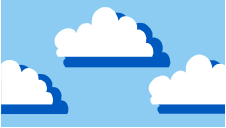


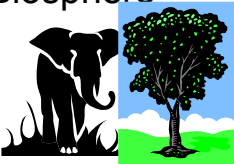
Definition:

That part of the environment that is the result of natural processes.

Examples of these natural processes include.....

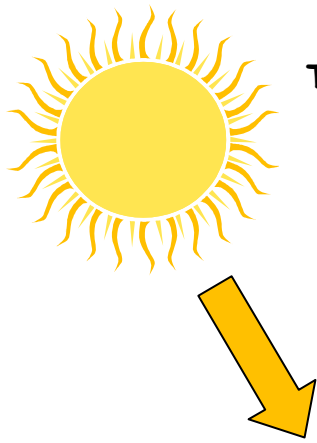
Photosynthesis, evaporation, erosion, reproduction, deposition.

Components and features of the Natural Environment:

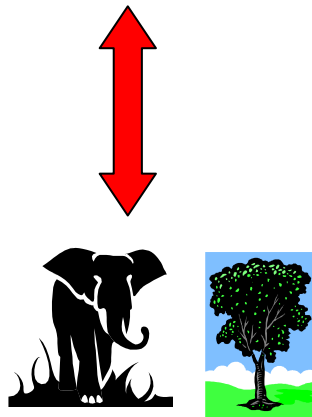
Component	Explanation	Features - examples
Atmosphere 	The gaseous portion of our planet – the layer of air that covers the spherical surface of the earth.	Wind, oxygen
Hydrosphere 	The water portion of the planet.	Lake, river, puddle, glacier
Lithosphere 	The solid portion of the planet.	Soil, rock, volcano
Biosphere 	The living portion of the earth	Bee, tree, frog, grass

The Natural Environment.

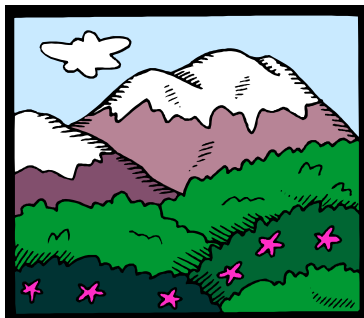
The natural environment is made up of four components with interactions between all four. All four need each other.



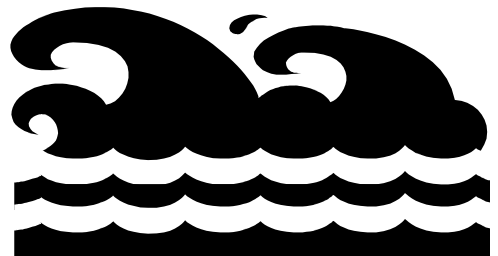
Atmosphere (gases)



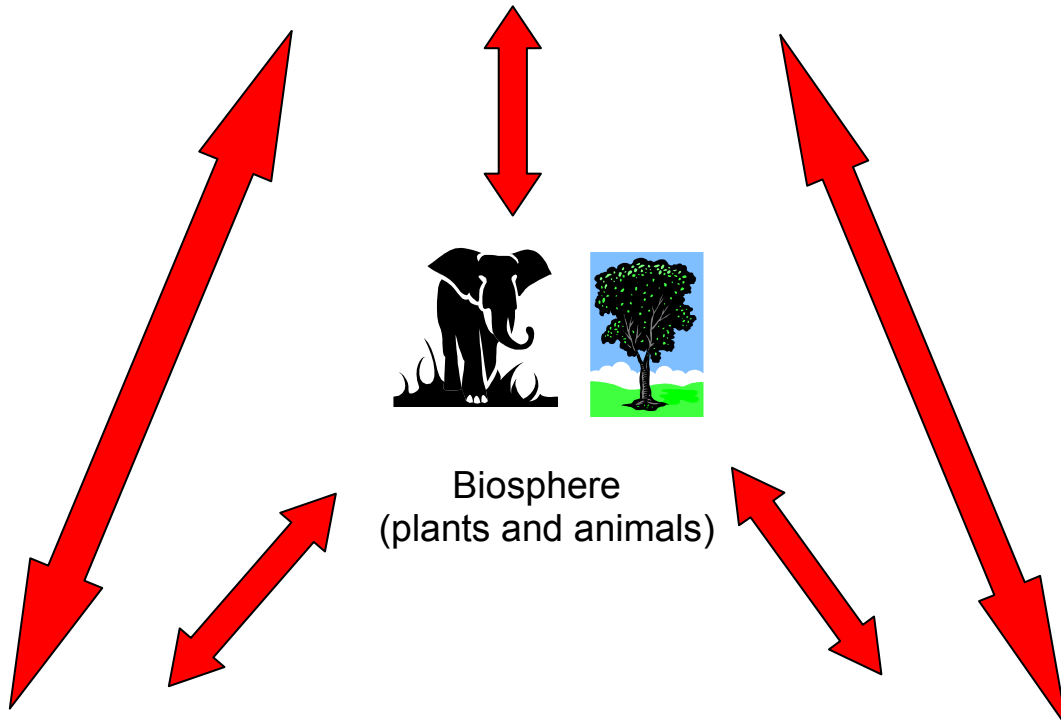
Biosphere
(plants and animals)



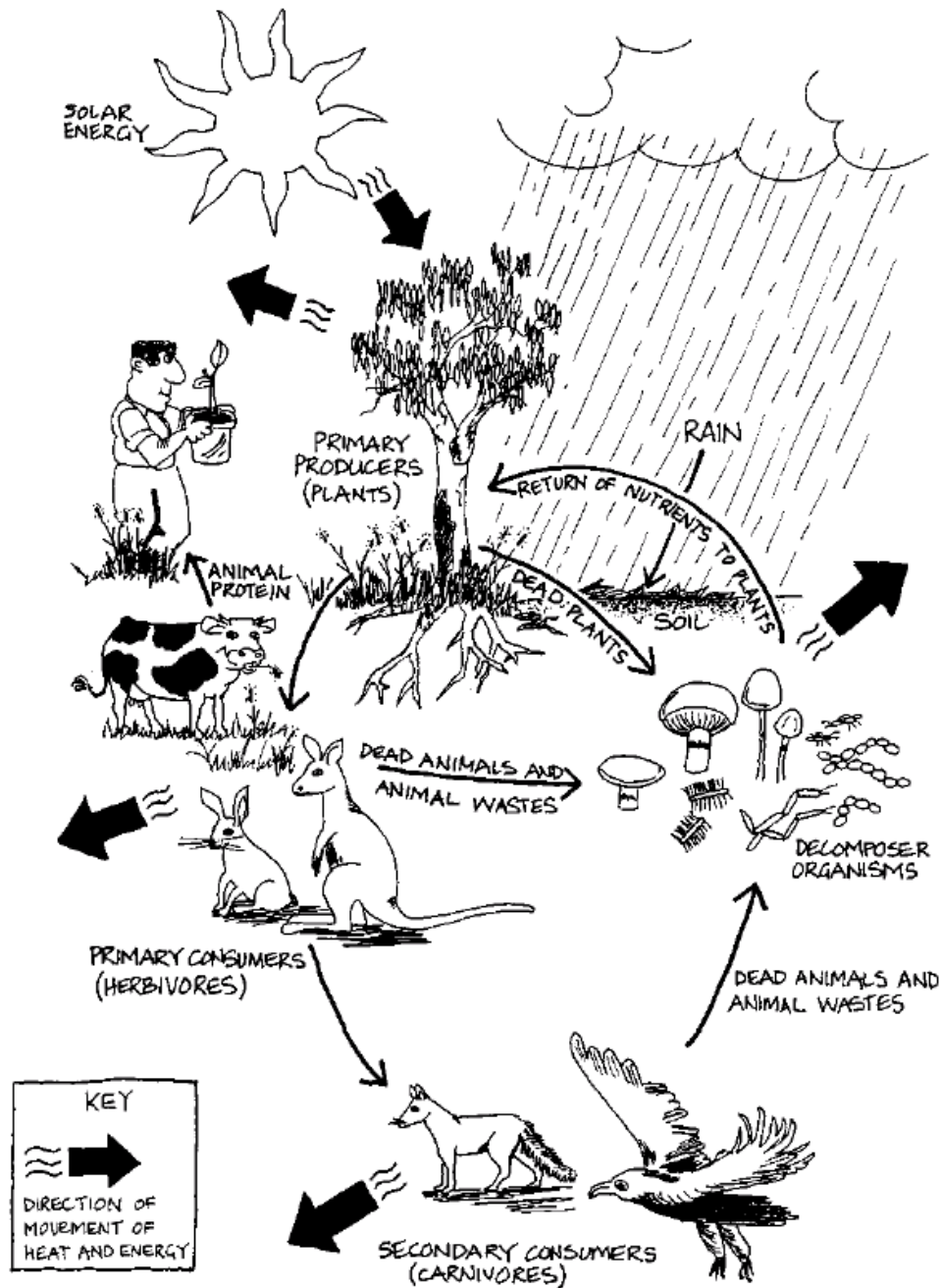
Lithosphere (land)



Hydrosphere (water)



Ecosystems...

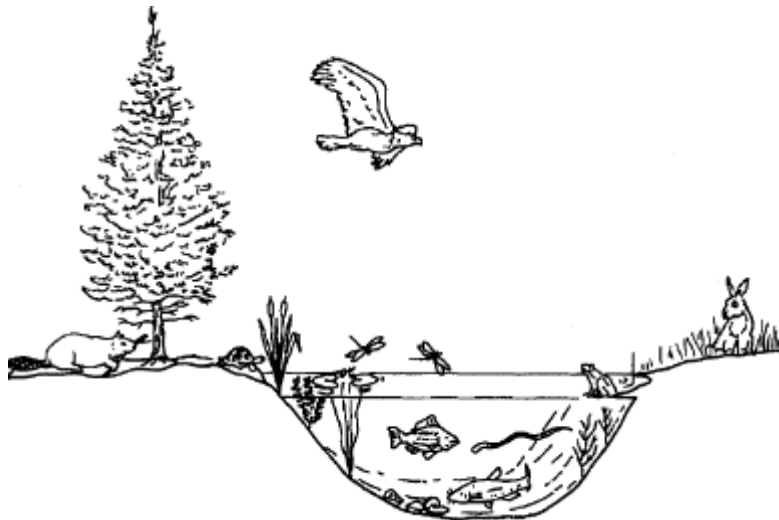


Some of the ways living and non-living things interact in an ecosystem.

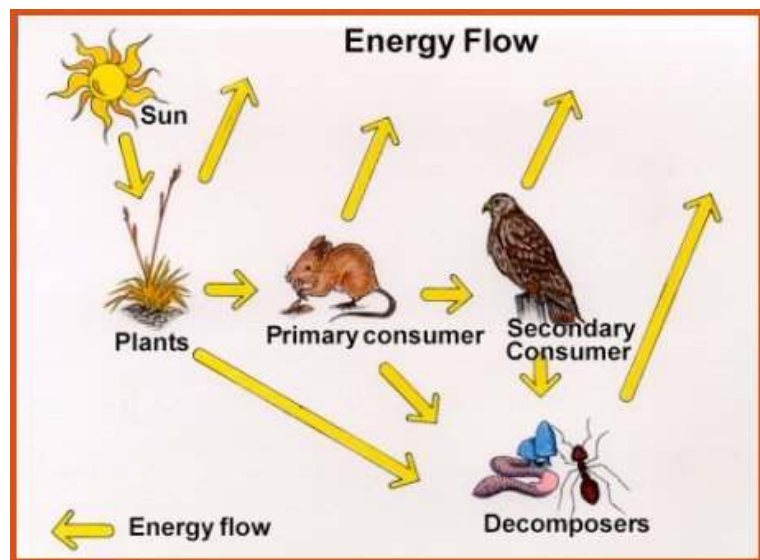
Definitions:

Ecosystem

- An **ecosystem** is a natural unit consisting of all plants, animals and micro-organisms (biotic factors) in an area functioning together with all of the non-living physical (abiotic) factors of the environment. An ecosystem is a completely independent unit of interdependent organisms which share the same habitat. Ecosystems usually form a number of food webs which show the interdependence of the organisms within the ecosystem.
<http://en.wikipedia.org/wiki/Ecosystems>
- An ecosystem consists of a dynamic set of living organisms (plants, animals, and microorganisms) all interacting among themselves and with the environment in which they live. An ecosystem does not have precise boundaries – it can be as small as a pond or a dead tree, or as large as the Earth itself. An ecosystem can also be defined in terms of its vegetation, animal species, or type of relief. The major ecosystems are generally described as:
 - aquatic ecosystems – saltwater or freshwater ecosystems
 - terrestrial ecosystems – forests, prairies, deserts, etc.<http://www.galapagos.org/2008/index.php?id=122>
- a system formed by the interaction of a community of organisms with their physical environment
wordnet.princeton.edu/perl/webwn
- A living system which considers the interactions between living (plants and animals) and non-living components (water, land, air, chemicals) of an area or an environment.
- An independent community of living organisms interacting with their physical environment.



Food webs and Food chains.



<http://www.bcgrasslands.org/grasslands/ecosystemprocesses.htm>

A **food chain** shows how each living thing gets its food. Some animals eat plants and some animals eat other animals. For example, a simple food chain links the trees & shrubs, the giraffes (that eat trees & shrubs), and the lions (that eat the giraffes). Each link in this chain is food for the next link. A food chain always starts with plant life and ends with an animal.

1. Plants are called **producers** because they are able to use light energy from the Sun to produce food (sugar) from carbon dioxide and water.
2. Animals cannot make their own food so they must eat plants and/or other animals. They are called **consumers**. There are three groups of consumers.
 - a. Animals that eat ONLY PLANTS are called **herbivores** (or primary consumers).
 - b. Animals that eat OTHER ANIMALS are called **carnivores**.
 - carnivores that eat herbivores are called secondary consumers
 - carnivores that eat other carnivores are called tertiary consumers e.g., killer whales in an ocean food web ... phytoplankton → small fishes → seals → killer whales
3. Animals and people who eat BOTH animals and plants are called **omnivores**.
4. Then there are **decomposers** (bacteria and fungi) which feed on decaying matter.

These decomposers speed up the decaying process that releases mineral salts back into the food chain for absorption by plants as nutrients.

Ecology - The scientific study of living things in relation to each other and to their natural environment.

System - A group of many different parts which are dependent on each other and interact in a complex way.

Environment – Everything external to an organism (or population) that influences its chances of surviving and reproducing.

Community - A group of independent plant and animal population living in a certain locality.

Population - A group of individuals of one kind (species) found in a particular place.

Ecological Components – The parts that make up an ecosystem. (land, air, water, plants, animals)

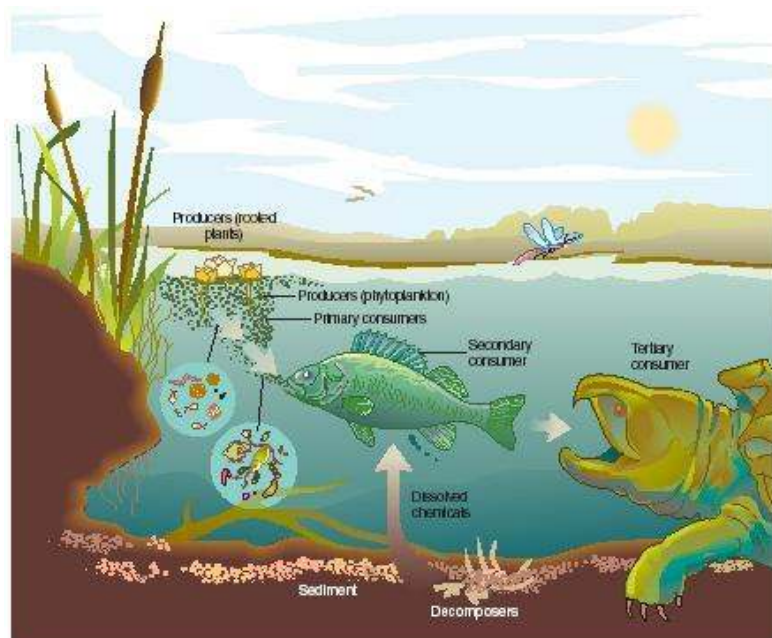
Ecological Processes - Actions that act on components of the ecosystems causing them to change. E.g. erosion, reproduction, growth, evaporation.

Biotic -

- Consisting of living organisms.
- Associated with or derived from living organisms.
- The biotic factors in an environment include the organisms themselves as well as such items as predation, competition for food resources, and symbiotic relationships.

Abiotic -

- Nonliving:
- Not associated with or derived from living organisms.
- Abiotic factors in an environment include such items as sunlight, temperature, wind patterns, and precipitation.



Biogeochemical cycles:

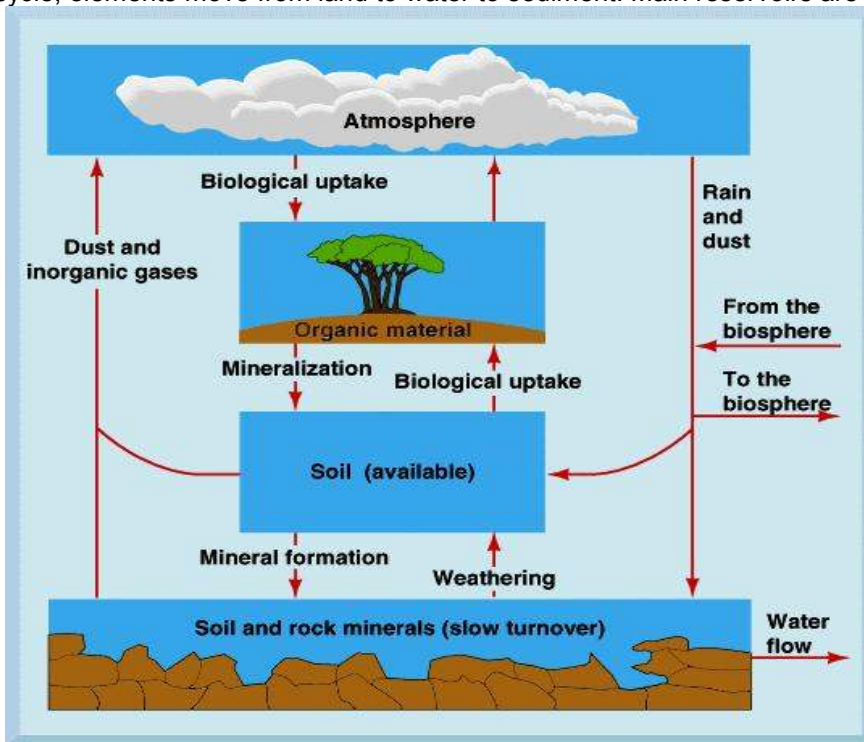
The recycling of critical nutrients throughout the natural environment.

All living things can be found within a relatively thin layer on or near the surface of the earth. Apart from the sun's energy, all their needs are supplied by the small proportion of the earth's resources contained in this layer. About forty of the ninety-two naturally occurring elements are essential for life. However, six of these elements – carbon, oxygen, hydrogen, nitrogen, phosphorus and sulphur- make up over 95% of the mass of all plants, animals and micro-organisms. These elements are all needed to supply energy for life, and are also important in the process of growth and constant renewal of all living cells.

If these elements, vital for life were only used once, they would soon run out as there is a fixed supply of all elements on earth. This is why many of nature's processes work in cycles- The elements must continually move or cycle through the natural environment and be used over and over again. There is a constant exchange of the elements between air, earth, water, plants and animals, and these recycling processes ensure that all living things are able to live and grow.

These cycles are referred to as biogeochemical cycles or nutrient cycles. Biogeochemical cycles generally have two phases: the environmental phase, where the chemical element is in the abiotic components of soil, water or air: and the organismic phase, where the element is incorporated into the biotic components (living things).

These elements cycle in either a gas cycle or a sedimentary cycle; some cycle as both a gas and sediment. In a gas cycle elements move through the atmosphere. Main reservoirs are the atmosphere and the ocean. In a sedimentary cycle, elements move from land to water to sediment. Main reservoirs are the soil and sedimentary rocks.

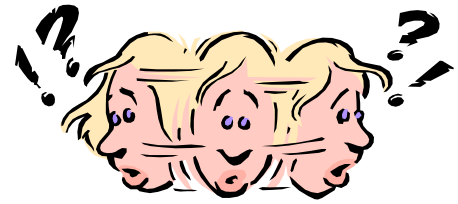


An internet search will provide lots of information and diagrams for these various cycles

A generalized ecosystem mineral cycling. Chemical elements cycle within an ecosystem or exchange between an ecosystem and the biosphere. Organisms exchange elements with the nonliving environment; some elements are taken up from and released to the atmosphere, and others are exchanged with water and soil or sediments. The parts of an ecosystem can be thought of as storage pools for an element. The elements move among pools at different transfer rates and remain within different pools for different average lengths of time called residency times. For example, the soil in a forest has an active part which rapidly changes elements with living organisms, and an inactive part, which exchanges elements slowly (as shown in the lower part of the diagram). Generally, life benefits if elements are kept within the ecosystem and are not lost by geologic processes, such as erosion, that remove them from the ecosystem.

<http://www.colorado.edu/GeolSci/courses/GEOL1070/chap04/chapter4.html>

Environmental changes can vary according to



WHEN: the time frame (sudden /gradual short term/ long term)

WHERE: the scale (area of impact - local specific spot/global impact)

WHY: the cause (nature or human)

CHANGES TO THE NATURAL ENVIRONMENT.

In each box give an example of a big impact change (e.g. Lithosphere natural: volcano eruption) and a small change (Biosphere human: planting a tree)

Sphere	Caused by nature	Caused by humans
Atmosphere	1. 2.	1. 2.
Lithosphere	1. 2.	1. 2.
Biosphere	1. 2.	1. 2.
Hydrosphere	1. 2.	1. 2.