

BIODIVERSITY

"Biodiversity is the variety of species and ecosystems on the Earth and the ecological processes of they are a part of."

All Living Things are:

made of cells,
need energy,
reproduce.
grow and develop,
get rid of their wastes,
and respond to their environment
with adaptations (*which suit them
to the specific habitat in which
they live*).

Ecosystem diversity – the different types of living communities and the environments in which they can be found.

Community diversity – occurs within populations of organisms living within a particular ecosystem.

Species diversity – occurs within individual organisms of the same species. Plant and animal species are not distributed evenly throughout the various eco-regions of the world. Most of the different species of plants and animals can be found in tropical regions and, more specifically, in rainforests and coral reefs. Coral reefs reflect a great diversity of species. Like tropical forests, coral reefs support many different communities of organisms surviving on a small amount of nutrients, which are very efficiently recycled. The closer you get to the poles - biodiversity decreases.

Genetic diversity – occurs within organisms at a cellular level, as it describes the variety of genetic material in all living things

CLASSIFICATION

All organisms have been classified into **5 Kingdoms** based on their structural differences

Animalia (animals)
Plantae (plants)
Fungi (yeasts, moulds and mushrooms)
Protista (mostly single-celled organisms)
Monera (bacteria)

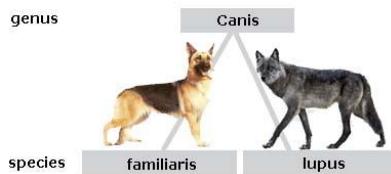
Each of these 5 Kingdoms are then further classified as ...

Kingdom
phylum
class
order
family
genus
species

TAXONOMY

The two-name Latin naming system for all living things was developed by **Carolus Linnaeus**. This classification system was much more reliable than previous systems, because he used structure, rather than habitat.

Two words identify each organism. The 1st represents the organisms **genus** and the 2nd represents the organisms particular **species**.



A **species** is a particular group of organisms that have the same structure and can reproduce with each other.

NICHES

A **niche** is the role of an organism within a particular ecosystem including:

- What it eats
- What eats it
- Its habitat
- Nesting site, range and habits
- What effect it has on the other populations
- What effect it has on the environment

A niche, for a particular organism, can change, depending on the environment in which it is located and the organisms with which it inter-relates.

Each and every species depends on many other species within an environment in order to survive and prosper.

Food chains and Food webs represent different types of ongoing relationships between and among all the organisms, within a particular environment.

SYMBIOSIS

A different type of interdependence is an **association**, within a certain population, between members of different species:

Commensalism – in which one of the participating members benefits, but the other does not, and there is no harm done to that organism. (*barnacles on a whale*)

Mutualism – both organisms benefit from the relationship. (*lichen (algae and fungi) growing in the Arctic Tundra benefit each other*)

Parasitism – one organism benefits while the other organism (the victim) is harmed. (the parasite usually doesn't kill the host, because the host represents the parasite's food supply. (*tapeworm in a human host*))

Interspecies competition happens when two or more species need the same resource. This type of relationship helps to limit the size of populations, of the competing species.

Resource partitioning is the action, which enables competing species to share the resources by accessing these resources in different ways, involving less direct competition.

Variation within a population, of a single species, is called **variability**.

Variation is one of the most critical aspects of species survival. This variation may not always be as easy to find as color usually is, because it may be a behavioral tendency or a genetic (cellular code) modification that enables some individuals within a species to survive, while others, of the same species, will perish. Variability is important if the environment, in which the species lives, changes (suddenly or drastically). When a species has a great deal of variation, then, some of the individuals within that species will likely survive when there is change.

Examples of variability include:

- Red fox (color of coat)
- Antibiotic resistance (bacteria)
- Banded snail (color of shell)

Discrete and Continuous Variations

Discrete variations are differences in characteristics that have a definite form. This includes those individuals, within a species, that have either one characteristic, or the single, other variation, of the characteristic.

Continuous variations are differences in characteristics that have a multitude of variations, such as height, shoe size, etc.

Variation and the Environment

Some variations may be influenced by interactions with the environment. These variations are not inherited. Examples include:

- Change in the pigmentation of skin color throughout the seasons due to the sun.
- Height and weight can be influenced by diet.

Inherited and Non-inherited

Inherited (heritable) characteristics are those traits which are passed on to offspring directly from their parents. These traits are passed on by way of the genetic material that is combined from the parents during the process of sexual reproduction. Heritable traits include, structural and distinguishing characteristics, such as eye color, hair type, skin color and earlobes.

Non-inherited characteristics are acquired and not necessarily passed on from generation to generation. Athleticism, artistic ability, leadership qualities are all learned during the early years of life.

Natural Selection happens when factors in the environment 'selects' which individuals, within a species, will be able to survive and live long enough to reproduce. Individuals with 'survival adaptations' will have offspring with similar survival characteristics.