Types of Biodiversity

Biodiversity can be viewed on three levels namely: genetic diversity, species diversity, and ecosystem diversity. All three interact and change over time and from place to place.

Species diversity refers to the variety of different living things.

Genetic diversity refers to the variations between individuals of a species — characteristics passed down from parents to their offspring.

Ecosystem diversity refers to the great variety of environments produced by the interplay of the biotic (living animals and plants) and the abiotic (non-living world; earth forms, soil, rocks, air and water).

Genetic diversity

Each species consists of individuals with their own particular genetic composition. When the individuals interbreed, their offspring have new combinations of the genes, resulting in new mixtures of the characteristics of the species.

This diversity of characteristics is essential for the survival of healthy populations in natural communities. When the environment of a community changes, as they do over time, some individuals will have characteristics that suit the new environment. They are more likely to survive
and produce offspring that are also suited to the new environment. **As a result, the whole population may change. This is how the process of adaptation occurs.**

If a small population of a species becomes isolated from the larger group, the small population is forced to reproduce by breeding within itself — to inbreed. Inbreeding can result in a loss of genetic diversity, making it harder for the species to adapt to changing conditions. This loss of genetic diversity can eventually result in the extinction of the population.

**Species diversity**

Species diversity refers to the different types of living organisms on Earth. This includes the many types of birds, insects, plants, bacteria, fungi, mammals, and more. Many differing species often live together in communities depending on each other to provide their needs.

A species can be defined as a group or population of similar organisms that reproduce by interbreeding within the group. Members of a species do not normally reproduce with members of any other species. Members of a specific species possess common characteristics that distinguish them from other species and this remains constant regardless of geographic location.

**Human beings, for example, belong in a single species — Homo sapiens and can successfully breed with different human populations around the world because they all belong to the same species.**

**Ecosystem diversity**

Ecosystems are the combination of communities of living things with the physical environment in which they live. There are many different kinds of ecosystems, from mountain slopes and savannahs to oceans and coral reefs. The most diverse and ecologically rich systems include rainforests and coral reefs.

Each ecosystem provides many different kinds of habitats or living places providing a home for a myriad of species. Different species have differing functional roles to play in ecosystems which help maintain the characteristics unique to that ecosystem.

Ecosystems are dynamic in nature and can go through a number of changes in their species composition before they become stable. However, despite their dynamic nature and changes that may occur, some events remain constant such as energy and nutrient cycling.

You can begin to appreciate how the elements in each ecosystem are connected to each other and the diversity that exists amongst Earth's ecosystems. Maintaining this ecological diversity is important for the health of the planet.