

SPECIES RICHNESS

INTRODUCTION



DID YOU KNOW?

Around 1 million species are currently facing extinction..

DID YOU KNOW?

There has been a 69% average decline of all biodiversity on Earth (in population sizes of mammals, bird, amphibians, reptiles, and fish, as well as some invertebrates and plants, between 1970 and 2021..

DID YOU KNOW?

Human activities have significantly altered $\frac{3}{4}$ of land-based environments.

We are all aware that human activities are damaging our world. It is time to change our behaviours, but in order to make sustainable change we need to fully understand the concept and importance of biodiversity.

Let's remind ourselves what biodiversity is:

Biodiversity refers to the variety of life on earth at all its levels: genes, species, and ecosystems. It is key to sustaining life supporting processes and thus life on earth.

Measuring biodiversity is the first step in understanding how you can help protect and even increase the levels of biodiversity at your school.

Higher levels of biodiversity within ecosystems are associated with higher resistance to environmental damage and change.

Watch: https://www.youtube.com/watch?v=GK_vRtHJZu4

When we talk about biodiversity of an area, we are referring to a few levels:

Level 1: Genetic diversity within a species.

Level 2: The diversity between species.

Level 3: Diversity between ecosystems on earth.

Species Richness

Species richness is a measurement of the number of species in a community or ecosystem. It does not consider population numbers and evenness of species.

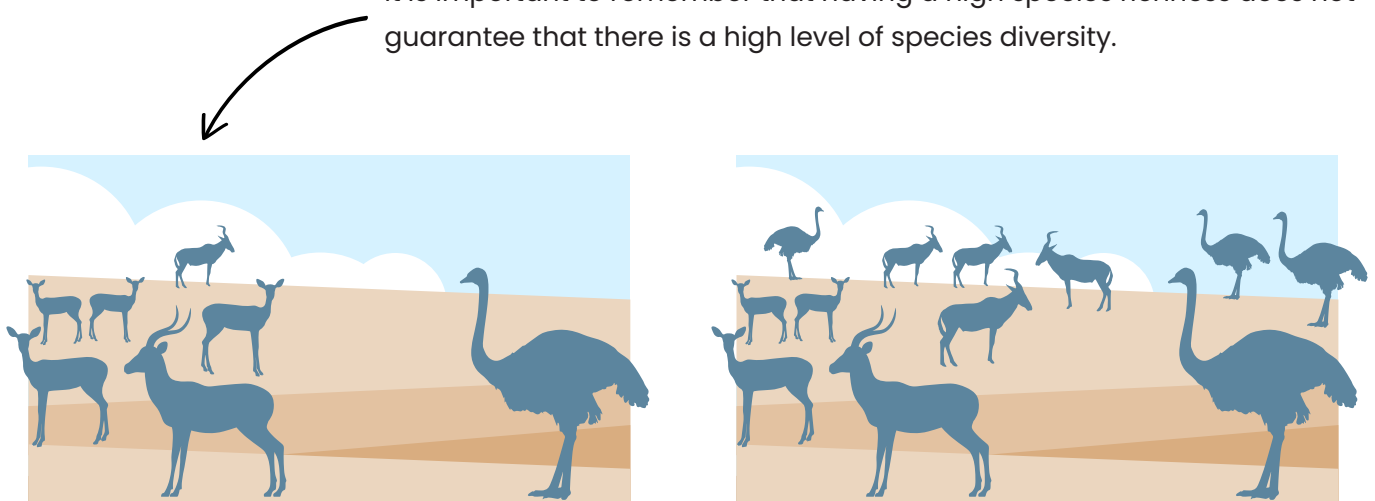
Species Diversity

Species diversity is a more complex measurement, meaning it not only takes into account the number of species but also how evenly distributed a species is. It measures how abundant a species is within an area.

Let's compare two ecosystems. Both ecosystems have 200 individuals. Both ecosystems have 10 species. In the first ecosystem of the 200 individuals, 150 belong to one species and the remainder of individuals belong to the rest of the 9 species. In the second ecosystem, there are 20 individuals per species so the spread is more even. Ecosystem 2 has a greater species diversity. Species diversity is usually described with an index.

In terms of conservation, a community dominated by fewer species is less diverse.

It is important to remember that having a high species richness does not guarantee that there is a high level of species diversity.



Why is diversity important?



EDUCATOR HINT:



Try our
Web of Life
activity to explore
this practically
with learners.

- It builds resistance to stresses on ecosystems.
- Helps support a variety of species (e.g., more plant species can support a higher number of insects).
- Support complex ecosystem processes like water filtration, which in turn leads to more robust ecosystem services that benefit us as the human population.

LESSON PLANNING

STEP 1: Introduce the concept of biodiversity to your class. Suggest an ecosystem that they are familiar with (e.g., Forest and fynbos) and ask them to name as many species as possible that they can think of that play a part in this ecosystem.

Ask the following questions:

- Why do we count species?
- How do we count species?

The following video clip might be helpful:

Why is biodiversity important? <https://www.youtube.com/watch?v=GIWNuzrqe7U>

STEP 2: Show your class pictures of two different ecosystems. One should have high species diversity and the other low species diversity.

Inland regions: Karoo National Park and sheep farm in the karoo

Northern regions: Kruger National Park Savannah and grazing lands

Riverine areas: Natural river ecosystem and a man-made dam

STEP 3: Discuss with your class:

- Which area had higher species diversity? Why?
- Which area had lower species diversity? Why?

Introduce the concepts of species richness

The following clip might be helpful, looking at Species Abundance, Species Richness and Species Diversity:

https://www.youtube.com/watch?v=ghhZCIDRK_g

STEP 4: Introduce the relevant worksheet to your class. Remember to choose a familiar vegetation type for your area. Choose from Inland, Northern or Riverine worksheets.

EXTENSION ACTIVITIES

Extension 1

Why not make this a practical activity and go on a fieldtrip in your province. For example, if you live in Cape Town, you could visit Tokai Forest which contains both fynbos and pine plantation (if you can't make the outing in person, check out this cool video made by the Friends of Tokai Park: https://youtu.be/CShC_pFwnro)

Extension 2

Sample the biodiversity at your school and compare different areas of the school grounds. Use random sampling with a quadrant. For High School Learners, check out our Biodiversity Audit How to Measure Biodiversity for Grade 8-11.



REFERENCES

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