

Lesson 1: Introduction to Biodiversity

Brainstorm: What is **biodiversity**? Do -> Think, Write, Pair, Share

>Notes<

Key Idea 1: **Living things are both _____ from each other and from nonliving things.** Living things are similar in that they **rely on many of the same processes to stay alive**, yet are **different in the ways that these processes are carried out**. Nonliving things **lack** certain features of living organisms:

- The components of living systems, from a single cell to an ecosystem, interact to maintain balance.
- Diversity is evident and important at all levels of organization from a single cell to a multi-cellular organism to an ecosystem.

Key Idea 2: **There are 3 types of _____.**

- **Ecological diversity** – due to variations in _____ and _____ factors
 - different habitats, niches, species interactions
- **Species diversity** – a species is a group whose members are able to freely breed among themselves under natural conditions. For asexual reproduction, species are defined based on morphology (physical characteristics).
 - different kinds of organisms, relationships among species
- **Genetic diversity**
 - different genes & combinations of genes within populations



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Key Idea 3: Diversity promotes _____ of species and resiliency of ecosystems. You need to explain **HOW!**

- Different _____ within a species may help an individual, and therefore the species, survive
- Q: How do species interact? See chart below. More species in a given are (biodiversity) helps __

Interaction	Examples
Food Supply: Complex rltps exist b/w species and their food.	Boneworms feed exclusively on the bones of dead whales that sink to the bottom of the ocean. Photosynthetic microorganisms live inside the bodies of giant clams and coral animals on reefs. They perform photosynthesis and supply the clams with a steady supply of food
Protection: Many species depend on others for shelter and protection	Hermit crabs use the shells of dead snails for a protective home. Certain species of ants live in the trunks of <i>Cecropia</i> trees. The trees provide shelter for the ants. The ants protect the tree by biting/stinging herbivores that try to eat from it.
Transportation: Many species move from place to place with the help of another species.	Some flower mites climb onto bills of hummingbirds moving from flower to flower feeding on nectar. Many seeds have hooks that allow them to stick to passing animals. They can then be carried long distances before they fall off and start growing.
Reproduction: Many species depend on other species for their own successful reproduction.	Trilliums produce seeds with fleshy tissues that attract ants. The seeds are then gathered and dispersed by the ants. If the ants do not feed on this outer seed tissue, the seeds cannot germinate. Many bird species build their nests in the abandoned tree cavities made by woodpeckers for their own nests.
Hygiene: Some species help maintain the health of another species.	Coral reefs have “cleaning stations” where large fish come to have external parasites removed by small fish and shrimp. The bacteria that naturally live on our skin help protect us from other bacterial and fungal infections

Digestion: Species living within the digestive tracts are essential for the digestion of food

Termites consume wood but are almost entirely incapable of digesting it themselves. Instead, a variety of bacteria and other microorganisms living within the termites' guts do the digestion for them.
Bacteria living in the large intestines of humans produce vitamins that are absorbed into the circulatory system.

- Species diversity within an ecosystem helps strengthen the _____ of an ecosystem allowing the ecosystem to carry out or serve _____. Species have many roles within a functioning ecosystem and _____ increases the likelihood that at least one species will be able to carry out a given role in the ecosystem.
- Greater structural diversity (_____ factors) can support a greater diversity of species
- The diversity of biotic and abiotic factors within an ecosystem ensures and enhances the _____ that an ecosystem provides, like recycling nutrients, regulating gases in the atmosphere, and human benefit.

Key Idea 4: - Living (biotic) and nonliving (abiotic) environments change over time and respond to disturbances, thereby changing the biodiversity.

- analyse the impact that climate change might have on the diversity of living things (e.g., rising temperatures can result in habitat loss or expansion; changing rainfall levels can cause drought or flooding of habitats)
- analyse some of the risks and benefits of human intervention (e.g., tree plantations; monoculture of livestock or agricultural crops; overharvesting of wild plants for medicinal purposes; using pesticides to control pests; suppression of wild fires) to the biodiversity of aquatic or terrestrial ecosystems

Follow Up Questions

- Different forms of rat snakes are associated with different geographic locations (even though they are all the same species, you will only find each subtype in a specific area, see figure). Give reasons why you think this happens.

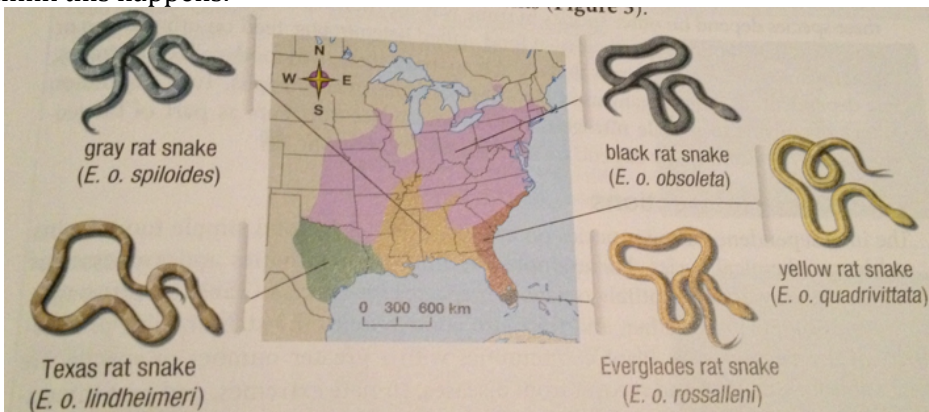


Figure: Five subspecies of rat snakes. These snakes are all considered members of the same species. They exhibit differences in colour and the presence or absence of stripes, depending on geographic location.

- How might the loss of diversity affect the following industries?
 - Agriculture and forestry
 - Tourism
 - Healthcare
- Pembroke recently constructed a new marine park to add to their tourism and provide an exciting learning environment for SBI3U students.
 - Why** might you suggest that they increase the biodiversity of their marine park?
 - How** would you suggest that they do this?
- Research an organization, a profession, or something in the news that has to do with biodiversity. Prepare a summary (note form, with reference(s)) for tomorrow.