

Biodiversity

AP Environmental Science · Unit 2: The Living World: Biodiversity

The Teaching Analogy

"Think of biodiversity like a pizza. Genetic diversity is the variety of toppings on one slice — more variety means more resilience if you lose one ingredient. Species diversity is having lots of different toppings across the whole pizza: richness is how many types you have, and evenness is how balanced they are. Ecosystem diversity is having multiple pizza styles on the menu — deep dish, thin crust — so if one fails, the others carry on."

Key Concept

Biodiversity refers to the variety of life at three levels: **genetic diversity** (range of traits within a species), **species diversity** (richness and evenness of species in an area), and **ecosystem diversity** (variety of habitat types in a region). High biodiversity creates resilience — when one component is lost, others fill its role and the system keeps functioning.

Guided Practice

1. Using the pizza analogy, explain what would happen to an ecosystem's "pizza" if all toppings were the same — how does this represent low genetic diversity?
2. A grassland has 10 plant species but 90% of plants are the same species. Is species richness or species evenness the problem? Explain using the pizza model.
3. After a wildfire destroys one ecosystem type in a region, a neighboring biodiverse region recovers faster. Which level of biodiversity — genetic, species, or ecosystem — is most responsible for this resilience? Defend your answer.

Extension Activity

Have students design their ideal "biodiversity pizza" for a local ecosystem — choose 3 toppings as keystone species, explain their diversity role, and predict what would happen to the whole pizza if each topping were removed one by one. Present to the class and compare which pizza (ecosystem) is most resilient and why.