

# What is Biodiversity and How Do We Classify Organisms?

## Worksheet

Biodiversity has three levels: species diversity (number of different species), genetic diversity (variation within species), and ecosystem diversity (range of habitats and communities). Classification systems organize this diversity into hierarchical groups.

### Questions

1. Which is an example of genetic diversity?

- A) Different dog breeds from the same species
- B) A forest with oaks, pines and maples
- C) Rainforest, desert and tundra biomes
- D) Different cat species in Africa

2. An island has 20 bird species, a mainland has 80. Which has greater biodiversity?

- A) The island (smaller areas are more diverse)
- B) The mainland (more species)
- C) They are equal (both have birds)
- D) Cannot tell without ecosystem data

3. Why does a small population of endangered animals lose genetic diversity?

- A) Inbreeding, genetic drift, bottleneck effect
- B) They move to new habitats
- C) Food becomes scarce
- D) Mutations stop occurring

4. Ecosystem diversity refers to

- A) Species within one ecosystem
- B) Genetic variation in species
- C) Variety of habitats and communities in a region
- D) Number of organisms in a population

5. A forest has 12 tree species, 8 bird species, 15 insect species and 3 mammal species. What is the total species richness?

6. Why is a forest with 40 similar tree species less diverse than one with 20 tree, 15 bird, 10 mammal and 10 insect species?

7. A population of wolves has only 5 breeding individuals. What biodiversity problem does this create?

8. Define: What is species diversity?

9. Define: What is genetic diversity?

10. Define: What is ecosystem diversity?

## Answer Key

1. A) Different dog breeds from the same species - Genetic diversity is variation within one species - dog breeds are all *Canis lupus* but differ genetically.
2. B) The mainland (more species) - Species richness is higher on mainland. More species generally means greater overall biodiversity.
3. A) Inbreeding, genetic drift, bottleneck effect - Small populations have fewer unique alleles; inbreeding and drift remove variation faster than new mutations add it.
4. C) Variety of habitats and communities in a region - Ecosystem diversity is the breadth of different habitat types - forests, wetlands, deserts, oceans.
5. Species richness = total number of species =  $12 + 8 + 15 + 3 = 38$  species
6. Species richness: both have 40 species, but the second has higher species evenness and ecosystem diversity. The first relies only on trees; the second has multiple functional groups more stable ecosystem.
7. Low genetic diversity - inbreeding increases, mutations accumulate, disease resistance drops. Small populations risk extinction from random events (bottleneck effect).
8. The number of different species in an area. Higher number = greater species diversity.
9. Variation in genes within a species. Important for adaptation and preventing inbreeding depression.
10. Variety of habitats and communities within a region - forests, wetlands, coral reefs, grasslands.

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