

1. What provides the specified final evidence of two species?
 - ☐ They cannot interbreed to produce fertile offspring
 - ☐ They have different average sizes and different diets
 - ☐ They live in different habitats and look different from each other
2. Which is a trace fossil?
 - ☐ Any modern drawing of a plant
 - ☐ Only a complete living animal
 - ☐ A preserved footprint
3. Which pair forms a binomial name?
 - ☐ Genus and species
 - ☐ Kingdom and class
 - ☐ Phylum and family
4. Which is a biotic change?
 - ☐ Arrival of a new predator
 - ☐ Higher wind speed
 - ☐ Change in soil pH alone
5. Which method best estimates abundance across a defined habitat?
 - ☐ Positions chosen where the plants look densest
 - ☐ Positions spaced along the path for easy access
 - ☐ Random representative quadrat positions
6. A boundary shifts 60 km over 20 years. Calculate its mean shift rate.
_____ km/year
7. A model peat habitat falls from 120 to 90 hectares. Find percentage area loss.
_____ %
8. Recorded richness rises from 10 to 15 species under equal sampling. Find percentage increase.
_____ %

9. Producer biomass is 500 kg and next-level biomass 60 kg. Calculate transfer efficiency.

_____ %

10. A model harvests 75 kg biomass and retains 60 kg after purification. Find recovery percentage.

_____ %

1. They cannot interbreed to produce fertile offspring

Two populations are separate species when they can no longer interbreed to produce fertile offspring. An afternoon apart or a size difference alone says nothing about interbreeding.

2. A preserved footprint

A trace fossil preserves an organism's ACTIVITY - a footprint, burrow or dropping - rather than its body. A living animal is not a fossil, and a modern drawing is just a drawing.

3. Genus and species

The binomial system names a species by its genus then its species epithet, as in *Homo sapiens*. Kingdom, class, phylum and family are higher ranks that play no part in the two-part name.

4. Arrival of a new predator

Biotic factors are living relationships; a new predator changes one directly. Soil pH and wind speed are non-living, so they are abiotic.

5. Random representative quadrat positions

Random quadrat positions give every patch an equal chance, so the estimate represents the whole habitat. Choosing the crowded patch or the door-side overestimates or distorts abundance.

6. 3 km/year

The result is 3 km/year. Known: boundary shifts 60 km over 20 years. Mean shift rate = $60/20 = 3$ km per year. This is a range statistic, not the speed of any animal.

7. 25 %

The result is 25 %. Known: habitat falls from 120 to 90 hectares. Loss = 30 hectares. Percentage loss = $30/120 \times 100 = 25\%$. Species losses need distribution data - area alone cannot give them.

8. 50 %

The result is 50 %. Known: richness rises from 10 to 15 species under equal sampling. Increase = 5 species. Percentage increase = $5/10 \times 100 = 50\%$. A comparison site is still needed to credit the programme.

9. 12 %

The result is 12 %. Known: producer biomass 500 kg; next-level biomass 60 kg. Use efficiency = consumer / producer $\times 100$. Efficiency = $60/500 \times 100 = 12\%$. Use the measured 12% rather than assuming a universal 10%.

10. 80 %

The result is 80 %. Known: harvest 75 kg; retained 60 kg after purification. Use recovery = retained / harvested $\times 100$. Recovery = $60/75 \times 100 = 80\%$. Recovery is not a protein percentage.