

1. What provides the specified final evidence of two species?

- ☐ They cannot interbreed to produce fertile offspring
- ☐ They are separated for one afternoon
- ☐ They have different average sizes alone

2. Which is a trace fossil?

- ☐ A preserved footprint
- ☐ Only a complete living animal
- ☐ Any modern drawing of a plant

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
- ☐ Change in soil pH alone
- ☐ Higher wind speed

5. Which method best estimates abundance across a defined habitat?

- ☐ Random representative quadrat positions
- ☐ Only the most crowded patch
- ☐ Only beside the classroom door

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.

_____ %

_____ %

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 x 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 x 100. Recovery = $60/75 \times 100 = 80\%$. Recovery is not a protein percentage.