

Diversity of organisms · supported focus

Supported focus · SL

Supported scope

- Supported SL focus. First assessment 2025; current subject brief acquired; full Biology guide not acquired. Remaining guide, assessment and practical requirements retain their recorded holds.
- State model conditions and distinguish fictional data from measurements.

Diversity · 1.1

Reasoning

Two species look similar but their DNA comparison places them in different branches. Classification uses several kinds of evidence rather than appearance alone. Start with a prediction. State the quantities or features you would compare, then decide what evidence could distinguish two explanations.

Diversity · 2.1

Reasoning

A species is a biological grouping; a taxon is a named classification group. A cladogram represents a hypothesis of relationships based on shared derived characteristics or molecular evidence. A branch point represents a common ancestor, not an individual alive today. taxon: A named group in a classification; clade : A common ancestor and all its descendants.

Diversity · 3.1

Reasoning

Read relationships from the branching order. Rotating branches at a node does not change ancestry. A branch length represents time or change only when the diagram gives a scale. Record character states in a matrix before drawing a tree. Define which state is ancestral using an appropriate comparison. Test whether a new molecular dataset supports the same grouping.

Diversity · 4.1

Reasoning

State the known values and their units. Choose the relation because its assumptions fit this case, then rearrange before substitution. Known: an alignment contains 40 sites, with 6 differences. Difference proportion = $6/40 = 0.15$, or 15%. This is an observed comparison, not a calibrated molecular clock unless rate assumptions and corrections are supplied.

Diversity · 4.2

Reasoning

There are 8 differences in 50 aligned sites. Calculate percentage difference. Use the same sequence: known quantities → model → relation → substitution → unit and interpretation.

Diversity · 5.1

Reasoning

A modern species is not automatically the ancestor of another modern species. Similarity caused by convergent evolution can mislead a classification based on one trait. Return to the original observation. Explain what the result supports, which conditions it assumes, and one way to test a competing explanation.

Diversity · 5.2

Reasoning

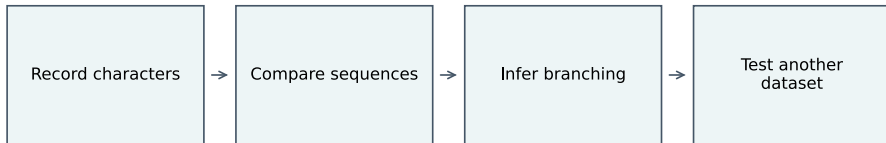
Every cladogram branch length is a measurement of elapsed time. This claim is false: A modern species is not automatically the ancestor of another modern species. Similarity caused by convergent evolution can mislead a classification based on one trait.

Diversity · 5.3

Reasoning

Diversity, classification and a branching model: Read relationships from the branching order. Rotating branches at a node does not change ancestry. A branch length represents time or change only when the diagram gives a scale.

Diversity · diagram



- Original teaching diagram: Diversity, classification and a branching model
- Use the labels and the stated model together.

Diversity · original transfer

Your turn

Alignment A has 6 differences in 60 sites; B has 9 in 30. Compare proportions. Explain why these two values alone cannot date a divergence.

Diversity · transfer reasoning

Method and interpretation

A=10%; B=30%. Site choice, substitution-rate assumptions and repeated substitutions affect interpretation; percentage difference alone supplies no calibrated time.

Check yourself

- Explain taxon using the stated model.
- Explain clade using the stated model.
- Change one value in the original transfer; explain which assumption still matters.