Module 17: Speciation and Macroevolution

1. Define the Biological Species Concept. What is the key criterion?
2. Why is this concept difficult to apply to fossils or asexual organisms? What is the Morphological Species Concept?
3. Classify the following as pre-zygotic or post-zygotic:
4. Temporal isolation (different mating seasons)
5. Gametic isolation (sperm cannot fertilize egg)
6. Hybrid sterility (mule)
7. Compare allopatric and sympatric speciation. Which requires a geographic barrier?
8. Scenario**: Finches colonize a volcanic archipelago with many unoccupied niches.
9. Explain how one ancestral species can rapidly diversify into many species.
10. Sharks (fish) and dolphins (mammals) have similar body shapes.
11. Did they inherit this shape from a common ancestor, or evolve it independently? What selective pressure drove this?
12. Contrast gradualism (slow, steady change) with punctuated equilibrium (stasis interrupted by rapid change).
13. Which model better explains gaps in the fossil record?
14. Critique the statement: "Evolution drives organisms toward perfection."
15. Is evolution goal-directed, or does it respond to immediate environmental pressures?