1. What is a biological species?
2. What does it mean for two types of organism to be reproductively isolated?
3. What is the phenetic species concept? How is this concept different from the biological species concept?
4. What is a subspecies?
5. How are hybrid zones relevant to the question of whether two populations are different species?
6. What are “sibling species?”
7. Give an example of a pair of species that are commonly thought to be difficult to distinguish and tell how they can be distinguished.
8. Why is *Escherichia coli* not a biological species?
9. Why are horses and donkeys considered different species, but dachshunds and poodles are not?
10. Give an example that shows the difference in morphology is sometimes not a good criterion for calling two forms different species.
11. What is it about *Pipilio maculatus* and *Pipilio ocai* that allow them to be called different species even though there are several localities where they freely produce fit and fertile hybrids?
12. Why is genetic isolation usually a necessity for maintaining two different forms as species?
13. Compare premating isolation with postmating isolation.
15. Give an example of temporal isolation in closely related sympatric species.
16. Give an example of ecological isolation in closely related sympatric species.
17. Give an example of behavior isolation in closely related sympatric species.
18. Give an example of hybrid inviability in closely related sympatric species.
20. What is “Haldane’s Rule?” What might explain the pattern that is called “Haldane’s Rule?”
21. What is “F2 breakdown?”
22. What is the relationship between genetic divergence and time since divergence for species pairs of *Drosophila*?
23. Why should prezygotic isolation be stronger among sympatric forms than among allopatric forms?
24. Describe the Dobzhansky-Muller Incompatibility model for the evolution of reproductive isolation.
25. Describe the allopatric speciation model.
26. Describe the parapatric speciation model.
27. When two populations evolve in allopatry and then come back together and interbreed describe what might happen if the offspring of all matings have equal fitness.
28. Describe how natural selection acting in allopatric populations can result in the formation of new species.
29. Describe how genetic drift acting in allopatric populations can result in the formation of new species.
30. If two populations, living in the same area, are partially isolated through a prezygotic isolating mechanism (80% of all matings occur between members of the same populations and 20% of the matings occur between members of different populations and all matings produce healthy fertile offspring), what would you expect to happen if contact between the two populations continued?
31. If two populations are slightly isolated through a postzygotic isolating mechanism (80% of the matings between individuals from the two populations produce healthy offspring, but 20% of the matings produce infertile offspring), what would you expect to happen if the contact between the two populations continued?
32. What is reproductive character displacement?
33. Give a potential scenario for the evolution of character displacement in two closely related species that have recently come into contact.
34. Describe how peripatric speciation can occur without the involvement of genetic drift.
35. Describe how peripatric speciation can occur where genetic drift is involved.
36. Describe how parapatric speciation might occur.
37. How can disruptive selection produce sympatric speciation?
38. What aspects of the biology and history of apple maggot flies makes them an important example of speciation?
39. Describe how polyploidy can result in the formation of new species.
40. Compare the Multiregional Hypothesis for the evolution of modern humans with the Out of Africa Hypothesis.
41. What evidence supports the Out of Africa hypothesis?
42. What evidence supports the proposition the humans and Neanderthals interbred?