

Descent with Modification

Chapter 22

1. Use the concept of descent with modification to explain both the relationship between all living things and the diversity of life on the planet. (Organisms share characteristics (the unity of life) because they share common ancestors. The diversity of life occurs because new species form when descendant organisms gradually adapt to different environments, becoming different from their ancestors.)
2. Imagine you discovered a fossil of an extinct mammal that lived at high altitude in the Andes. Predict whether it would more closely resemble present day mammals from South American jungles or present-day mammals that live at high altitudes in the Himalayas. Justify your response. (The fossil mammal would most likely have colonized the Andes from within South America, sharing a more recent common ancestor than they would with Asian species and, so, should more closely resemble modern species in South America.)
3. Explain why genetic variation within a population is a prerequisite for evolution. (Natural selection acts on the variation between individuals. Without differences, no individual would have an advantage and allele frequencies would not change.)
4. Explain how the statement “Antibiotics have created drug resistance in bacterial species.” is inaccurate. (An environmental factor such as a drug does not create new traits, such as drug resistance, but rather selects for traits among those that are already present in the population.)
5. Explain why populations evolve but individuals do not. (An individual cannot change its genetic makeup. The frequency of particular alleles in a population can change, and that is evolution.)
6. Explain why homologous structures provide evidence for evolution. (Characteristics present in an ancestral organism are altered by natural selection in its descendants over time as they face different environmental conditions. As a result, related species can have characteristics that have an underlying similarity yet function differently.)
7. Describe how fossils provide evidence of evolution. (The fossil record shows that past organisms differed from present-day organisms and that many species have become extinct.)