



## Chapter 20 Exercises

### Review Questions

- What is used to determine phylogeny?
  - mutations
  - DNA
  - evolutionary history
  - organisms on earth
- What do scientists in the field of systematics accomplish?
  - discover new fossil sites
  - organize and classify organisms
  - name new species
  - communicate among field biologists
- Which statement about the taxonomic classification system is correct?
  - There are more domains than kingdoms.
  - Kingdoms are the top category of classification.
  - Classes are divisions of orders.
  - Subspecies are the most specific category of classification.
- On a phylogenetic tree, which term refers to lineages that diverged from the same place?
  - sister taxa
  - basal taxa
  - rooted taxa
  - dichotomous taxa
- Which statement about analogies is correct?
  - They occur only as errors.
  - They are synonymous with homologous traits.
  - They are derived by similar environmental constraints.
  - They are a form of mutation.
- What do scientists use to apply cladistics?
  - homologous traits
  - homoplasies
  - analogous traits
  - monophyletic groups
- What is true about organisms that are a part of the same clade?
  - They all share the same basic characteristics.
  - They evolved from a shared ancestor.
  - They usually fall into the same classification taxa.
  - They have identical phylogenies.
- Why do scientists apply the concept of maximum parsimony?
  - to decipher accurate phylogenies
  - to eliminate analogous traits
  - to identify mutations in DNA codes
  - to locate homoplasies
- The transfer of genes by a mechanism not involving reproduction is called:
  - meiosis
  - web of life
  - horizontal gene transfer
  - gene fusion
- Identify the term that describes the following definition:  
Particles that transfer genetic material from one species to another, especially in marine prokaryotes
  - horizontal gene transfer
  - lateral gene transfer
  - genome fusion device
  - gene transfer agents
- What does the trunk of the classic phylogenetic tree represent?
  - single common ancestor
  - pool of ancestral organisms
  - new species
  - old species
- Which phylogenetic model proposes that all three domains of life evolved from a pool of primitive prokaryotes?
  - tree of life
  - web of life
  - ring of life
  - network model

### Critical Thinking Questions

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13. How does a phylogenetic tree relate to the passing of time?
14. Some organisms that appear very closely related on a phylogenetic tree may not actually be closely related. Why is this?
15. List the different levels of the taxonomic classification system.
16. Dolphins and fish have similar body shapes. Is this feature more likely a homologous or analogous trait?
17. Why is it so important for scientists to distinguish between homologous and analogous characteristics before building phylogenetic trees?
18. Describe maximum parsimony.
19. Compare three different ways that eukaryotic cells may have evolved.
20. Describe how aphids acquired the ability to change color.