

Multiple Choice

Write the letter on the line provided that best answers the question or completes the statement.

- ____ 1. Scientists assign each kind of organism a universally accepted name in the system known as
- traditional classification.
 - the three domains.
 - binomial nomenclature.
 - cladistics.
- ____ 2. For many species, there are often regional differences in their
- common names.
 - scientific names.
 - taxa.
 - binomial nomenclature.
- ____ 3. The second part of a scientific name is unique to each
- order in its class.
 - family in its order.
 - genus in its family.
 - species in its genus.
- ____ 4. Several different classes make up a
- kingdom.
 - phylum.
 - family.
 - genus.
- ____ 5. Which two kingdoms did Linnaeus recognize?
- bacteria and animals
 - plants and fungi
 - plants and animals
 - protists and animals
- ____ 6. Traditional classifications tended to take into account primarily
- extinct organisms.
 - RNA similarities.
 - DNA similarities.
 - general similarities in appearance.
- ____ 7. Sometimes organisms that are not closely related look similar because of
- convergent evolution.
 - molecular clocks.
 - mutations.
 - reclassification.
- ____ 8. In an evolutionary classification scheme, species within one genus should
- be more similar to each other than they are to other species.
 - not be similar in appearance.
 - be limited to species that can interbreed.
 - have identical genes.

- ___ 9. An analysis of derived characters is used to generate a
- a. family tree based on external appearance.
 - b. family tree based on DNA structure.
 - c. cladogram.
 - d. traditional classification system.
- ___ 10. What is true about dissimilar organisms such as a cow and a yeast?
- a. They are not related at all.
 - b. Their degree of relatedness cannot be evaluated.
 - c. Their degree of relatedness can be determined from their genes.
 - d. They can interbreed and thus are the same species.
- ___ 11. Scientists have found that humans and yeasts
- a. have similar genes for the assembly of certain proteins.
 - b. share all aspects of cellular structure.
 - c. have nothing in common.
 - d. cannot be evaluated for degree of relatedness.
- ___ 12. What kingdoms composed the three-kingdom classification system used by scientists in the 1800s?
- a. animals, plants, fungi
 - b. animals, plants, bacteria
 - c. animals, fungi, protists
 - d. animals, plants, protists
- ___ 13. Which of the kingdoms in the six-kingdom system of classification was once grouped with plants?
- a. Animalia
 - b. Carnivores
 - c. Fungi
 - d. Protista
- ___ 14. The three-domain system recognizes fundamental differences between two groups of
- a. prokaryotes.
 - b. eukaryotes.
 - c. protists.
 - d. multicellular organisms.
- ___ 15. Organisms in the kingdoms Eubacteria and Archaeobacteria were previously grouped in a kingdom called
- a. Animalia.
 - b. Fungi.
 - c. Monera.
 - d. Eukarya.

Completion

Complete each statement on the line provided.

16. In taxonomy, different classes of organisms might be grouped into the next larger category, a(an) _____.
17. A(An) _____ is a group of closely related species.

18. In cladistic analysis, a characteristic that arises as a lineage of organisms evolves over time is called a(an) _____.
19. A model known as a(an) _____ uses DNA comparisons to estimate the length of time that species have been evolving independently.
20. The domain _____ is composed of the kingdom Eubacteria.

Short Answer

In complete sentences, write the answers to the questions on the lines provided.

21. Why might a particular kind of organism have more than one common name?

22. How do you know that the groups *Ursus maritimus* and *Ursus arctos* are closely related?

23. How can such different animals as fishes, amphibians, reptiles, birds, and mammals all be grouped in a single phylum?

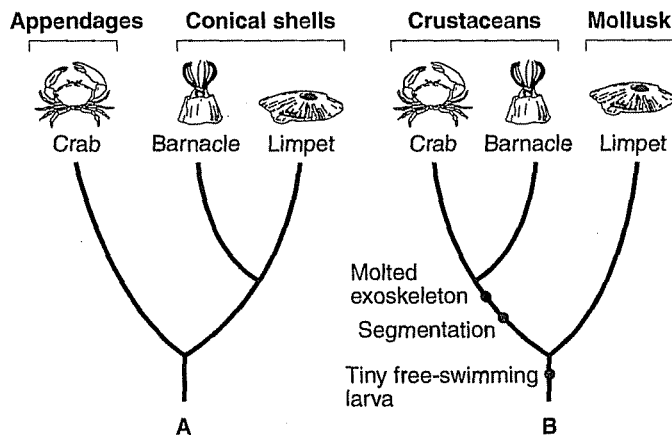


Figure 18-1

24. According to the cladogram in Figure 18-1, what two characteristics do crabs and barnacles share that limpets do not?

25. What recently developed technology allows scientists to compare the DNA of different kinds of organisms to determine classification?

Using Science Skills

Use the table below to answer the following questions on the lines provided.

Classification of Living Things

DOMAIN	Bacteria	Archaea	Eukarya			
KINGDOM	Eubacteria	Archaeobacteria	Protista	Plantae	Fungi	Animalia
CELL TYPE	Prokaryote	Prokaryote	Eukaryote	Eukaryote	Eukaryote	Eukaryote
CELL STRUCTURES	Cell walls with peptidoglycan	Cell walls without peptidoglycan	Cell walls of cellulose in some; some have chloroplasts	Cell walls of cellulose; chloroplasts	Cell walls of chitin	No cell walls or chloroplasts
NUMBER OF CELLS	Unicellular	Unicellular	Most unicellular; some colonial; some multicellular	Multicellular	Most multicellular; some unicellular	Multicellular
MODE OF NUTRITION	Autotroph or heterotroph	Autotroph or heterotroph	Autotroph or heterotroph	Autotroph	Heterotroph	Heterotroph
EXAMPLES	<i>Streptococcus</i> <i>Escherichia coli</i>	Methanogens, halophiles	<i>Amoeba</i> , <i>Paramecium</i> , slime molds, giant kelp	Mosses, ferns, flowering plants	Mushrooms, yeasts	Sponges worms, insects, fishes, mammals

Figure 18-2

26. **Using Tables and Graphs** According to Figure 18-2, what is the main difference between the domain Bacteria and the domain Archaea?

27. **Applying Concepts** If you know an organism has a cell wall and is a multicellular autotroph, could you use Figure 18-2 to determine in which kingdom it belongs? Why or why not?

28. **Using Tables and Graphs** Can you determine, by examining Figure 18-2, which kingdom contains the greatest number of species? Why or why not?

29. **Applying Concepts** If you were told only that an organism is unicellular and has chloroplasts and a nucleus, could you use Figure 18-2 to determine to which kingdom it belongs? Why or why not?

30. **Using Tables and Graphs** Considering the data presented in Figure 18-2, which characteristic seems more important in assigning an organism to a specific domain—the presence or absence of a nucleus or its mode of nutrition? Why?

Essay

Write the answer to each question in the space provided.

31. How is binomial nomenclature superior to the descriptive names used by early scientists?

32. How does traditional classification differ from evolutionary classification?