Name _____ Class _____ Date _____

SECTION 18-3 REVIEW

TWO MODERN SYSTEMS OF CLASSIFICATION

VOCABULARY REVIEW For each of the kingdoms listed below, state the cell type (prokaryotic or eukaryotic), number of cells (unicellular, multicellular, or both), and form of nutrition (autotrophy, heterotrophy, or both).

1. Archaebacteria _____
2. Eubacteria _____
3. Protista _____
4. Fungi _____
5. Plantae _____
6. Animalia _____

MULTIPLE CHOICE Write the correct letter in the blank.

_____ 1. The organisms that live in hostile environments that cannot support other forms of life are members of the kingdom

a. Protista. **b.** Archaebacteria. **c.** Eubacteria. **d.** Fungi.

_____ 2. Amoebas and giant kelp belong to the kingdom

a. Fungi. **b.** Plantae. **c.** Protista. **d.** Archaea.

_____ 3. Mushrooms, puffballs, mildews, and molds belong to the kingdom

a. Fungi. **b.** Plantae. **c.** Protista. **d.** Eukarya.

_____ 4. The domain that includes the organisms that cause tooth decay and food poisoning is called

a. Eukarya. **b.** Archaea. **c.** Bacteria. **d.** Eubacteria.

_____ 5. The domain that includes organisms with true nuclei and membrane-bound organelles is called

a. Bacteria. **b.** Archaea. **c.** Animalia. **d.** Eukarya.

_____ 6. The domain Eukarya includes

a. archaebacteria, protists, fungi, and plants.
b. protists, fungi, plants, and animals.
c. protists, fungi, eubacteria, and archaebacteria.
d. fungi, eubacteria, plants, and animals.

Name _____ Class _____ Date _____

SHORT ANSWER Answer the questions in the space provided.

1. What characteristics distinguish archaebacteria from eubacteria? _____

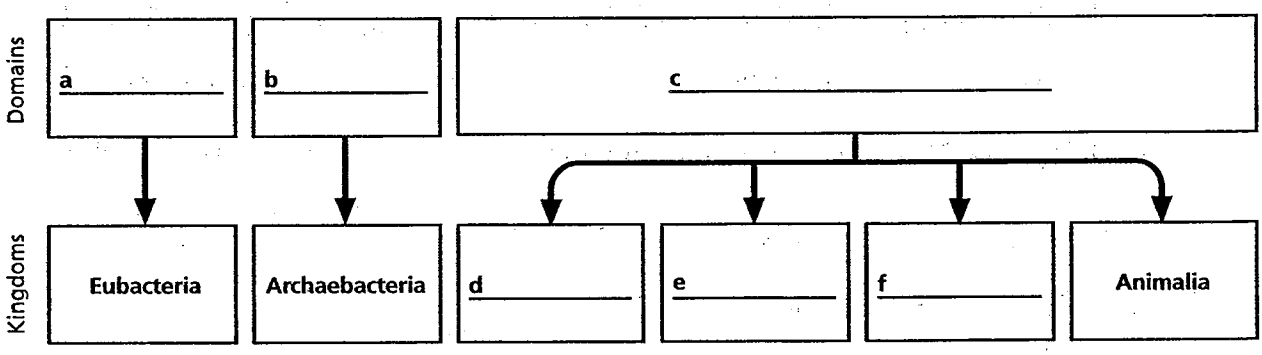
2. What characteristics distinguish fungi from plants? _____

3. Which kingdoms include multicellular heterotrophic organisms? _____

4. What evidence led scientists to develop the three-domain system of classification? _____

5. **Critical Thinking** Another possible way to classify organisms would be to separate them into unicellular and multicellular organisms. Explain why this is not a useful classification system.

STRUCTURES AND FUNCTIONS The diagram below represents the relationship between the three-domain system and the six-kingdom system of classifying organisms. Label each box in the diagram with the correct domain or kingdom name.



Name _____ Class _____ Date _____

SECTION 18-2 REVIEW

MODERN PHYLOGENETIC TAXONOMY

VOCABULARY REVIEW Define the following terms.

1. systematics _____

2. phylogenetic tree _____

3. cladistics _____

MULTIPLE CHOICE Write the correct letter in the blank.

_____ **1.** The legs of insects and the legs of mammals

a. are shared derived characters.
b. are homologous structures.
c. suggest descent from a common ancestor.
d. evolved independently in the two groups.

_____ **2.** Examination of embryological patterns of development reveals that

a. the blastopore becomes the same end of the digestive system in echinoderms and mollusks.
b. each cell in the embryo of an echinoderm or vertebrate has the potential to form an entire organism.
c. echinoderms are more closely related to arthropods than to vertebrates.
d. vertebrates are more closely related to mollusks than to echinoderms.

_____ **3.** The molecular-clock model of evolutionary relationships is based on the assumption that changes in amino acid sequence

a. are not random.
b. are affected by natural selection.
c. are greater in species with more-distant common ancestors.
d. occur at different rates in different organisms.

_____ **4.** One example of a derived character is provided by the

a. feathers of birds.
b. legs of birds.
c. legs of insects.
d. chromosomes of chimpanzees.

_____ **5.** Cladistic taxonomists establish evolutionary relationships among organisms by examining the organisms'

a. morphological similarities.
b. analogous structures.
c. homologous chromosomes.
d. shared derived characters.

Name _____ Class _____ Date _____

SHORT ANSWER Answer the questions in the space provided.

1. List four types of evidence used by systematic taxonomists to construct phylogenetic trees.

_____

_____

_____

2. What is a blastopore, and how is it used to indicate evolutionary relationships? _____

_____

_____

_____

3. How do shared derived characters help cladistic taxonomists determine phylogenetic relationships?

_____

_____

_____

4. **Critical Thinking** A paleontologist studying two modern species finds a 7-million-year-old fossil organism with a morphology similar to the modern species and concludes that it is an ancestor of both. A molecular biologist studying the amino acid sequence of a particular protein in both modern species concludes that the two species last shared a common ancestor 12.5 million years ago. Suggest possible reasons for the discrepancy in the two conclusions.

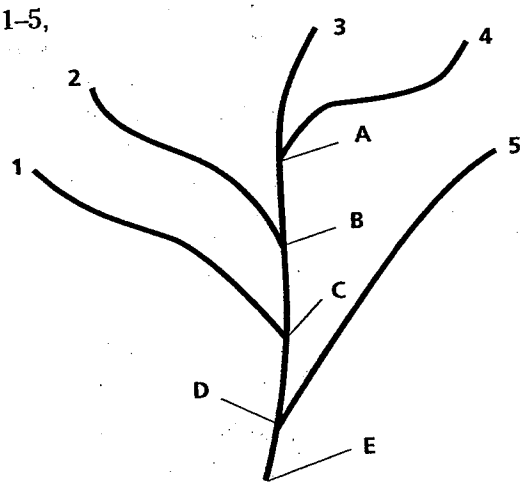
_____

_____

_____

STRUCTURES AND FUNCTIONS Use the figure to answer the following questions.

The phylogenetic tree shown below indicates the evolutionary relationships for a hypothetical group of modern organisms, labeled 1–5, and their ancestors, labeled *A–E*.



1. Which two modern organisms are likely to be most closely related? _____

2. What was the most recent common ancestor of organisms 2 and 3? _____

3. What was the most recent common ancestor of organisms 1 and 5? _____

Name _____ Class _____ Date _____

SECTION 18-1 REVIEW

HISTORY OF TAXONOMY

VOCABULARY REVIEW Distinguish between the terms in each of the following pairs of terms.

1. taxonomy, phylogeny _____

2. kingdom, species _____

3. phylum, division _____

4. species name, species identifier _____

5. varieties, subspecies _____

MULTIPLE CHOICE Write the correct letter in the blank.

_____ 1. Aristotle classified animals on the basis of

a. their size.
b. their evolutionary history.
c. where they lived.
d. what they ate.

_____ 2. The main criterion used in Linnaeus's system of classification is an organism's

a. phylogeny. **b.** morphology. **c.** taxonomy. **d.** hierarchy.

_____ 3. Each subset within a class of organisms is called

a. an order. **b.** a family. **c.** a genus. **d.** a phylum.

_____ 4. In the scientific name of an organism, the first part is the

a. species identifier. **b.** variety. **c.** subspecies. **d.** genus.

_____ 5. The species name of the lion is

a. Panthera leo. **b.** panthera leo. **c.** *Panthera leo.* **d.** *Panthera Leo.*

Name _____ Class _____ Date _____

SHORT ANSWER Answer the questions in the space provided.

1. How were the classification systems of Aristotle and Linnaeus similar? _____

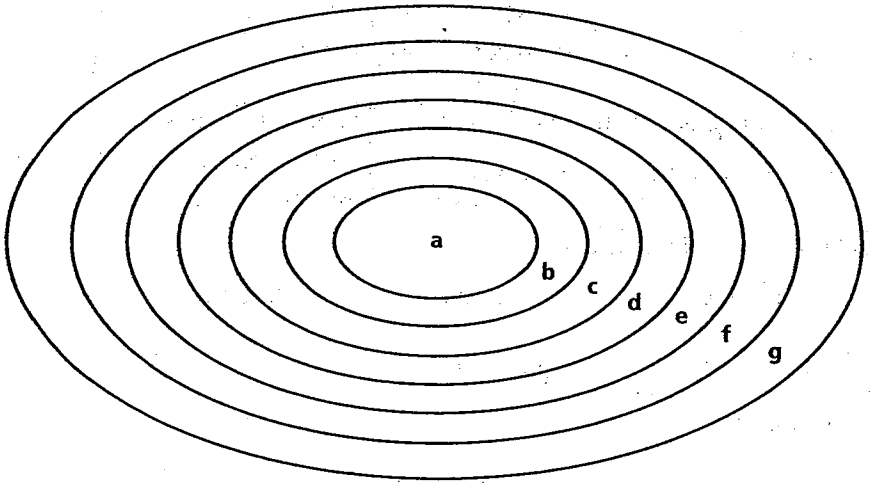
2. The word part *bi-* means "two," and the word part *nomen* means "name." Explain how these word parts relate to the system scientists use to identify organisms. _____

3. How does the classification process used by modern taxonomists differ from that used by Linnaeus?

4. **Critical Thinking** Explain why Aristotle's system of classifying animals is no longer used by biologists. Use examples from the animal kingdom to support your answer. _____

STRUCTURES AND FUNCTIONS Use the figure to answer the following questions.

1. Fill in the names of the seven levels of organization in Linnaeus's system of classifying organisms, with *a* representing the smallest category and *g* the largest category.



a _____

b _____

c _____

d _____

e _____

f _____

g _____

2. Provide a specific example for the level represented by *g*. _____