Name_____ Class_____ Date_____

Chapter 18

Classification

Section 18–1 Finding Order in Diversity (pages 447–450)

This section explains how living things are organized for study.

Why Classify? (page 447)

1. Why do biologists use a classification system to study the diversity of life? _____

_____

2. The science of classifying organisms and assigning them universally accepted names is known as _____.
3. Is the following sentence true or false? In a good system of classification, organisms placed into a particular group are less similar to each other than they are to organisms in other groups.

_____

Assigning Scientific Names (page 448)

4. Why is it confusing to refer to organisms by common names? _____

_____

_____

_____

5. Circle the letter of each sentence that is true about early efforts at naming organisms.
   a. Names were usually in English.
   b. Names often described detailed physical characteristics of a species.
   c. Names could be very long.
   d. It was difficult to standardize the names.
6. The two-word naming system developed by Linnaeus is called _____.
7. Circle the letter of each sentence that is true about binomial nomenclature.
   a. The system is no longer in use today.
   b. Each species is assigned a two-part scientific name.
   c. The scientific name is always written in italics.
   d. The second part of the scientific name is capitalized.
8. What is the genus of the grizzly bear, *Ursus arctos*? _____

_____

Name _____ Class _____ Date _____

Linnaeus's System of Classification (pages 449–450)

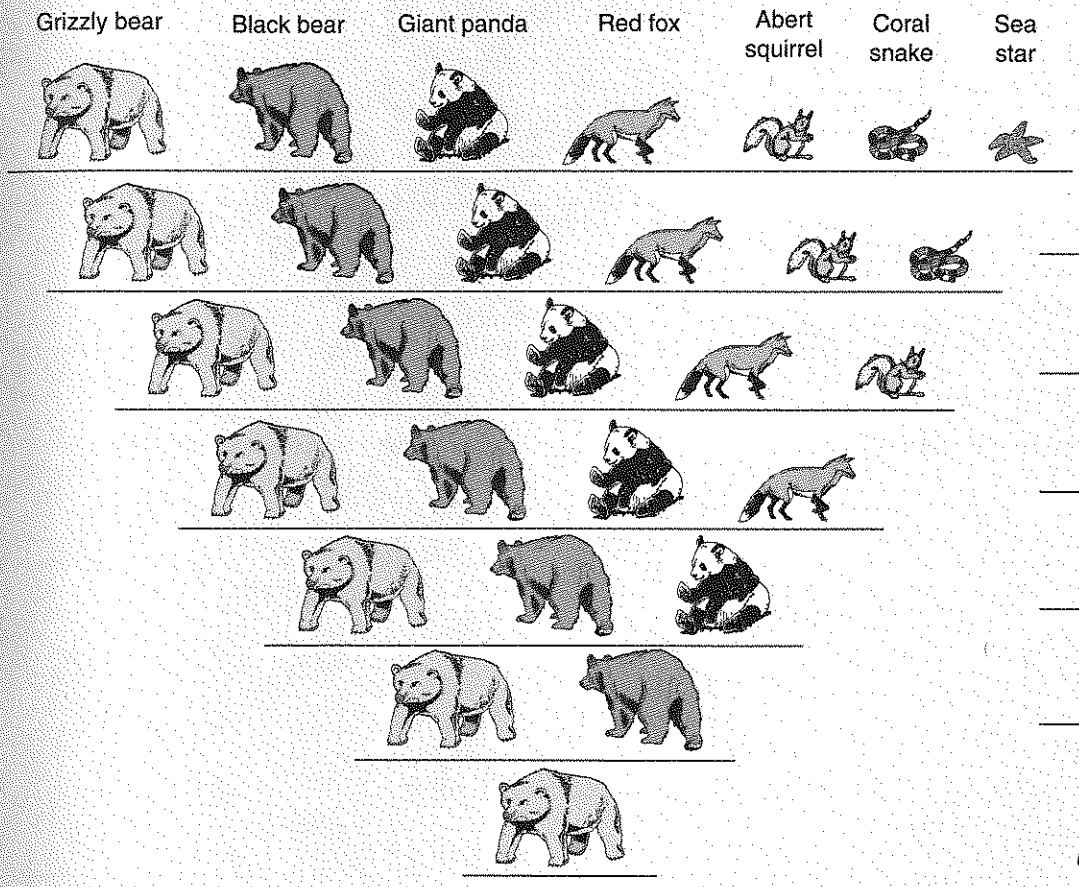
9. A group or level of organization in taxonomy is called a taxonomic category, or _____.

10. The largest taxonomic category in Linnaeus's system of classification is the _____, and the smallest is the _____.

11. What two kingdoms did Linnaeus name? _____

_____

12. Fill in the name of each missing taxonomic category in the chart below.



Reading Skill Practice

Taking notes can help you identify and remember the most important information when you read. Take notes on Section 18–1 by writing the main headings and under each heading listing the most important points. Include in your notes the bold-faced terms and sentences. Do your work on a separate sheet of paper.

Section 18–2 Modern Evolutionary Classification (pages 451–455)

This section explains how evolutionary relationships are important in classification. It also describes how DNA and RNA can help scientists determine evolutionary relationships.

Introduction (page 451)

1. What traits did Linnaeus consider when classifying organisms? _____

_____

_____

Problems With Traditional Classification (page 451)

2. What problems are faced by taxonomists who rely on body structure comparisons? _____

_____

_____

_____

Evolutionary Classification (page 452)

3. Is the following sentence true or false? Darwin's theory of evolution changed the way biologists thought about classification.

_____

4. How do biologists now group organisms into categories? _____

_____

_____

5. Is the following sentence true or false? Genera placed within a family should be less closely related to one another than to members of any other family. _____

6. The strategy of grouping organisms together based on their evolutionary history is called _____

_____.

Classification Using Cladograms (page 453)

7. Circle the letter of each sentence that is true about cladistic analysis.
   - **a.** It considers only traits that are evolutionary innovations.
   - **b.** It considers all traits that can be measured.
   - **c.** It considers only similarities in body structure.
   - **d.** It is a method of evolutionary classification.
8. Characteristics that appear in recent parts of a lineage, but not in its older members, are called _____.

Name _____ Class _____ Date _____

9. A diagram that shows the evolutionary relationships among a group of organisms is called a(an) _____.
10. Is the following sentence true or false? Derived characters are used to construct a cladogram. _____

Similarities in DNA and RNA (page 454)

11. Is the following sentence true or false? Some organisms do not have DNA or RNA. _____
12. How do similarities in genes show that humans and yeasts share a common ancestry? _____

Molecular Clocks (page 455)

13. A model that uses DNA comparisons to estimate the length of time that two species have been evolving independently is known as a(an) _____.
14. A molecular clock relies on the repeating process of _____.
15. Why are only neutral mutations useful for molecular clocks? _____
16. Is the following sentence true or false? The degree of dissimilarity in DNA sequences is an indication of how long ago two species shared a common ancestor. _____
17. Why are there many molecular clocks in a genome instead of just one? _____

Section 18–3 Kingdoms and Domains (pages 457–461)

This section describes the six kingdoms of life as they are now identified. It also describes the three-domain system of classification.

The Tree of Life Evolves (pages 457–458)

1. Is the following sentence true or false? The scientific view of life was more complex in Linnaeus's time. _____
2. What fundamental traits did Linnaeus use to separate plants from animals? _____

3. What type of organisms were later placed in the kingdom Protista? _____

_____

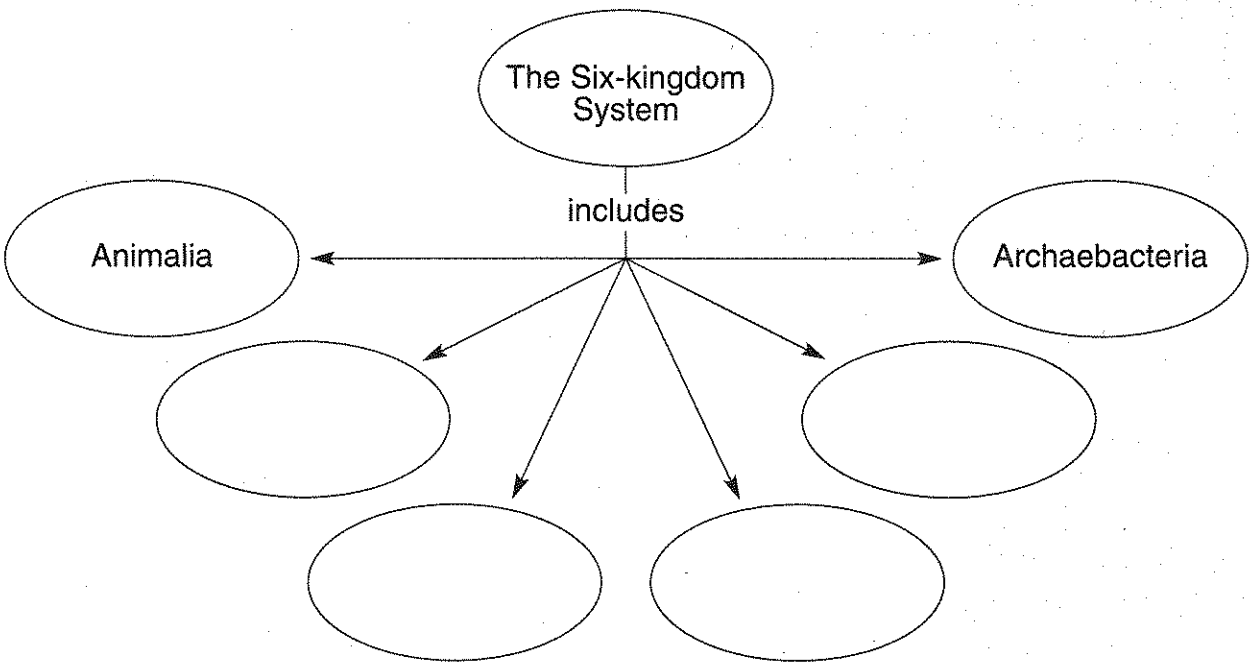
_____

4. Mushrooms, yeast, and molds have been placed in their own kingdom, which is called _____.
5. Why did scientists place bacteria in their own kingdom, the Monera? _____

_____

_____

6. List the two groups into which the Monera have been separated.
   a. _____
   b. _____
7. Complete the concept map.



The Three-Domain System (page 458)

8. A more inclusive category than any other, including the kingdom, is the _____.
9. What type of analyses have scientists used to group modern organisms into domains? _____

_____

10. List the three domains.
    a. _____
    b. _____
    c. _____

Name_____ Class_____ Date_____

11. Complete the chart below.

CLASSIFICATION OF LIVING THINGS

Domain	Kingdom	Examples
	Eubacteria	*Streptococcus, Escherichia coli*
Archaea		
	Protist	
		Mushrooms, yeasts
	Plantae	
		Sponges, worms, insects, fishes, mammals

Domain Bacteria (page 459)

12. Circle the letter of each sentence that is true about members of the domain Bacteria.
    - **a.** They are multicellular.
    - **b.** They are prokaryotes.
    - **c.** They have rigid cell walls.
    - **d.** The cell walls contain peptidoglycans.
13. Is the following sentence true or false? All members of the domain Bacteria are parasites. _____

Domain Archaea (page 459)

14. Circle the letter of each sentence that is true about members of the domain Archaea.
    - **a.** They are unicellular.
    - **b.** They are eukaryotes.
    - **c.** They lack cell walls.
    - **d.** They lack cell membranes.
15. Is the following sentence true or false? Many members of the domain Archaea can survive only in the absence of oxygen.

    _____

Domain Eukarya (pages 460–461)

16. Circle the letter of each sentence that is true about all the members of the domain Eukarya.
    - **a.** They have a nucleus.
    - **b.** They are multicellular.
    - **c.** They are heterotrophs.
    - **d.** They have cell walls and chloroplasts.

Match each kingdom with the description that applies to members of that kingdom.

Kingdom	Description
_____ 17. Protista	**a.** They have cell walls of chitin.
_____ 18. Fungi	**b.** They have no cell walls or chloroplasts.
_____ 19. Plantae	**c.** They include slime molds and giant kelp.
_____ 20. Animalia	**d.** They include mosses and ferns.

WordWise

Use the clues to help you identify the vocabulary terms from Chapter 18. Then, put the numbered letters in the right order to spell out the answer to the riddle.

Clues	Vocabulary Terms
Most inclusive taxonomic category	_ _ $\underset{1}{\_}$ _ _ _
Group of similar families	$\underset{2}{\_}$ _ _ _ _
Group of closely related classes	_ _ _ $\underset{3}{\_}$ _ _
Type of classification based on evolutionary history	$\underset{4}{\_}$ _ _ _ _ _ _ _ _ _ _ _
Group of closely related orders	$\underset{5}{\_}$ _ _ _ _
Group of closely related species	_ _ _ $\underset{6}{\_}$ _
Branching diagram showing evolutionary change	_ $\underset{7}{\_}$ $\underset{8}{\_}$ _ _ _ $\underset{9}{\_}$ _ _
One of two domains of unicellular prokaryotes	_ _ $\underset{10}{\_}$ _ _ _ _ _
Group of genera that share many characteristics	_ _ _ _ $\underset{11}{\_}$ _
Group into which organisms are classified	_ _ _ $\underset{12}{\_}$ _
The other domain of unicellular prokaryotes	_ _ $\underset{13}{\_}$ _ _ _ _
Domain of all organisms whose cells have nuclei	_ _ $\underset{14}{\_}$ _ _ _ _

Riddle: What kind of clock does a paleontologist use?

Answer: $\underset{1}{\_}$ $\underset{2}{\_}$ $\underset{3}{\_}$ $\underset{4}{\_}$ $\underset{5}{\_}$ $\underset{6}{\_}$ $\underset{7}{\_}$ $\underset{8}{\_}$ $\underset{9}{\_}$ $\underset{10}{\_}$ $\underset{11}{\_}$ $\underset{12}{\_}$ $\underset{13}{\_}$ $\underset{14}{\_}$