

Study Guide

CHAPTER 17

Section 1: The History of Classification

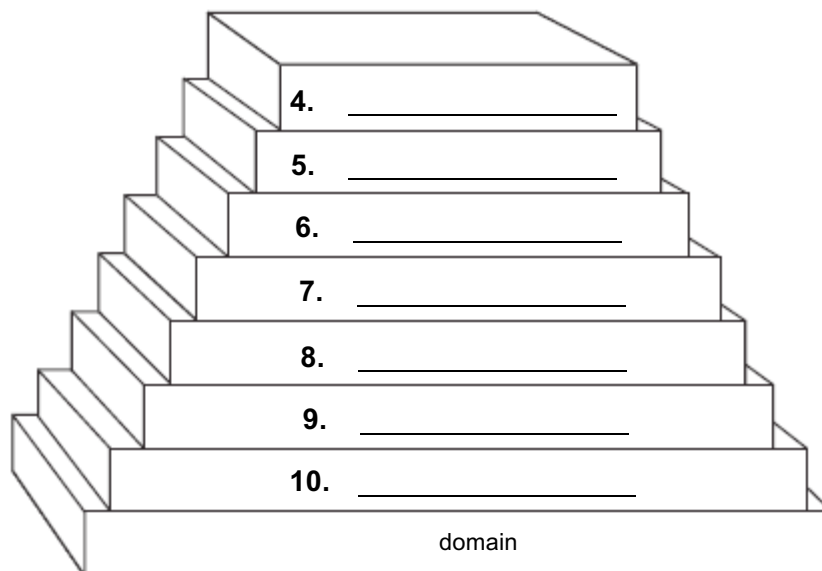
In your textbook, read about early systems of classification.

In the space at the left, write the letter of the term or phrase that best completes each statement or answers each question.

- _____ 1. Which statement describes the Linnaean system of biological classification?
- A. Animals were classified as living either on land, in water, or in air.
 - B. It was a six-kingdom system.
 - C. It was based on behavioral and morphological similarities and differences among organisms.
 - D. Plants were classified by average size and structure.
- _____ 2. In binomial nomenclature, the first part of an organism's name identifies the genus, and the second part identifies the _____
- A. family.
 - B. kingdom.
 - C. phylum.
 - D. species.
- _____ 3. What is the correct way that the scientific name for the American black bear should appear in print?
- A. *Ursus A.*
 - B. *Ursus Americanus*
 - C. *Ursus americanus*
 - D. *ursus americanus*

Label the diagram of taxa. Use these choices:

class family genus kingdom order phylum species



Section 1 The History of Classification (continued)

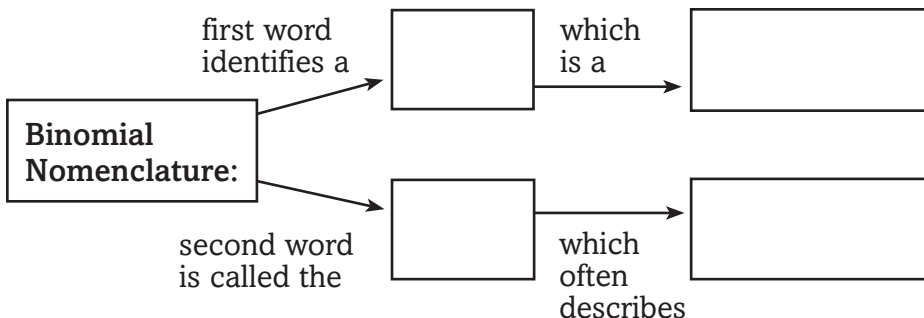
Main Idea

Details

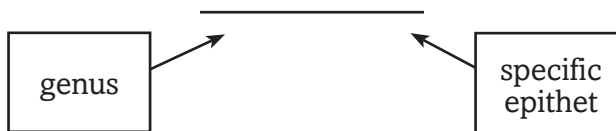
Early Systems of Classification

I found this information on page _____.

Identify the parts of Linnaeus' two-word naming system by completing the graphic organizer below.



Distinguish the genus and specific name, or epithet, for the species name of modern humans.



Taxonomic Categories

I found this information on page _____.

1. Compare data in the table below to determine which two animals are most closely related. Support your reasoning.

Classification of Selected Mammals				
Kingdom	Animalia	Animalia	Animalia	Animalia
Phylum	Chordata	Chordata	Chordata	Chordata
Class	Mammalia	Mammalia	Mammalia	Mammalia
Order	Cetacea	Carnivora	Carnivora	Carnivora
Family	Mysticeti	Felidae	Canidae	Canidae
Genus	<i>Balenopora</i>	<i>Felis</i>	<i>Canis</i>	<i>Canis</i>
Species*	<i>B. physalis</i>	<i>F. catus</i>	<i>C. latrans</i>	<i>C. lupus</i>
Common name	Blue whale	Domestic cat	Coyote	Wolf

* The species name is indicated as binominal nomenclature.

2. Analyze at which level the blue whale diverges from the other animals on the table.

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Section 2: Modern Classification

In your textbook, read about determining species.

Complete the table by filling in the missing information. Use these choices:

- | | | | |
|-----------------------|-----------------------------|-------------------|----------------|
| biological | evolutionary history | extinct | fertile |
| molecular data | physical | variations | |

Species Concept	Description	Disadvantage	Advantage
Typological	Classification is determined by comparison of (1) _____ characteristics with a type specimen.	Classification does not allow for genetic (2) _____, such as color, within a species.	Descriptions provide detailed records of physical characteristics of many organisms.
(3) _____	Classification is determined by similar characteristics and ability to produce (4) _____ offspring.	Some organisms interbreed occasionally. Does not account for (5) _____ species.	Working definition applies in most cases.
Phylogenetic	Classification is determined by (6) _____.	Evolutionary histories are not known for all species.	Accounts for extinct species, considers (7) _____, and solves problems of other species concepts.

In your textbook, read about characters.

Match the definition or example in Column A with the term in Column B.

Column A

- _____ 8. features of body structure such as type of beak and wings on birds
- _____ 9. chromosome banding patterns that show the close relationship among chimpanzees, gorillas, and orangutans
- _____ 10. model that uses comparisons of DNA sequences to estimate how long species have been evolving independently

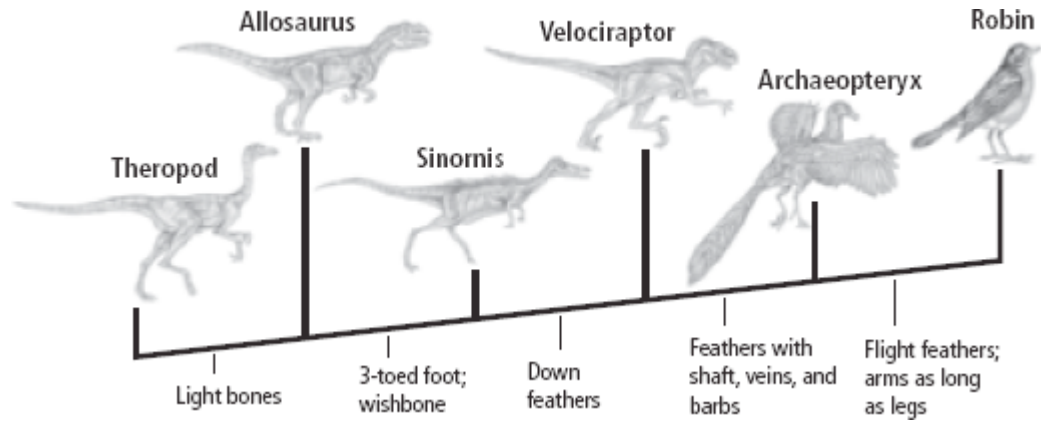
Column B

- A. biochemical characters
- B. molecular clock
- C. morphological characters

Study Guide, Section 2: Modern Classification continued

In your textbook, read about phylogenetic reconstruction.

Refer to the figure below. Respond to each statement.



11. **State** the name of this kind of diagram.

12. **Identify** which dinosaur is the most recent common ancestor of the robin and *Archaeopteryx*.

13. **Determine** which traits are shared by *Archaeopteryx* and robins.

For each statement below, write true or false.

_____ 14. A branch of a cladogram is called a clade.

_____ 15. Scientists have discovered and described 4 million species.

_____ 16. Darwin and Haeckel used the analogy of a wheel to represent phylogenies.

Section 2 Modern Classification (continued)

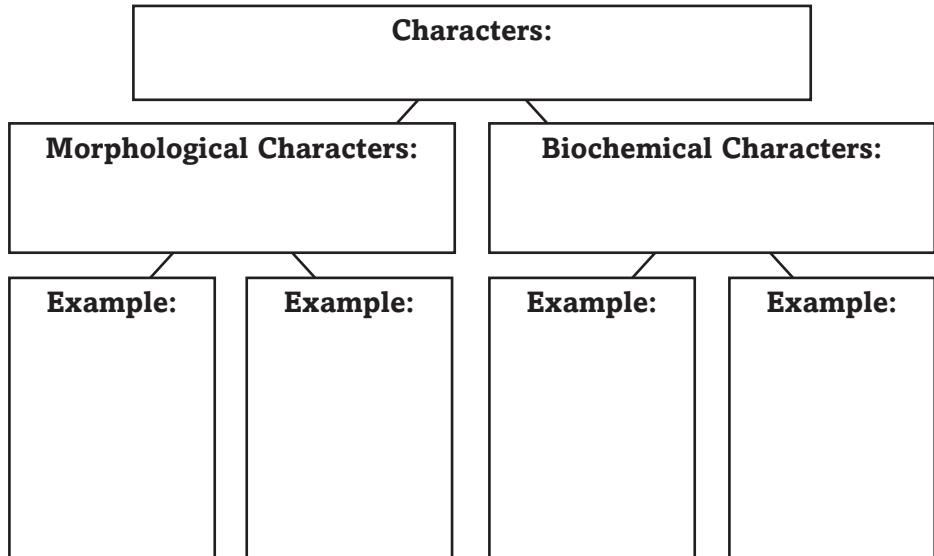
Main Idea _____

Details _____

Characters

I found this information on page _____.

Identify and give examples of the two types of characters in the concept map.



Phylogenetic Reconstruction

I found this information on page _____.

Describe cladograms by completing the paragraph.

A _____ is a branching diagram that represents the proposed _____ or evolution of a _____ or group. The groups used in cladograms are called _____. To _____ a cladogram, _____ characters are identified. Then the _____ of various species is identified based on the _____ or _____ of the derived characters in the _____. In making a cladogram, _____ assume that groups that _____ more derived characters have a more _____ common ancestor.

SUMMARIZE

Describe a process scientists use to construct a cladogram that includes a new species of vascular plant that was recently discovered in the rainforest.

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Section 3: Domains and Kingdoms

In your textbook, read about domains and kingdoms.

Complete the table by filling in the missing information. Use these choices.

Animalia Archaea Bacteria Bacteria Eukarya Fungi Plantae Protista

Description of Organisms	Domain	Kingdom(s)
Prokaryotes whose cell walls do not contain peptidoglycan	1. _____	2. _____
Prokaryotes whose cells walls contain peptidoglycan	3. _____	4. _____
Cells with membrane-bound organelles	5. _____	6. _____ 7. _____ 8. _____ 9. _____

In the space at the left, write the letter of the term or phrase that best completes each statement.

- _____ 10. Organisms are classified into domains according to _____
- A. cell type.
 - B. cell type and structure.
 - C. cell type, structure, and nutrition.
 - D. nutrition.

- _____ 11. Which organisms are in the same kingdom because they cannot form organs?
- A. archaea
 - B. fungi
 - C. plants
 - D. protists

- _____ 12. Which kingdom's organisms have no cell walls?
- A. Animalia
 - B. Archaea
 - C. Bacteria
 - D. Plantae

Respond to the following statement.

13. **Explain** why viruses are not included in the biological classification system.

Section 3 Domains and Kingdoms (continued)

Main Idea _____

Details _____

Domain Eukarya

I found this information on page _____.

Organize the kingdoms in the Domain Eukarya and describe their cell structure. List each kingdom's sources of energy and other important characteristics.

Kingdom	Cell Structure	Energy Sources	Other Characteristics
Protista			
Fungi			
Plantae			
Animalia			

SUMMARIZE

Model a diagram of the relationship between domains and kingdoms.