Name _____ Date _____ Class _____

Domains and Kingdoms

Guide for Reading

■ What characteristics are used to classify organisms?

■ How do bacteria and archea differ?

■ What are the kingdoms within the domain Eukarya?

Today, a three-domain system of classification is commonly used. The three domains are Bacteria, Archaea, and Eukarya. Within the domains are kingdoms. **Organisms are placed into domains and kingdoms based on their cell type, their ability to make food, and the number of cells in their bodies.**

Members of the domain Bacteria are prokaryotes. **Prokaryotes** are organisms whose cells lack a nucleus. A **nucleus** is a dense area in a cell that contains nucleic acids—the chemical instructions that direct the cell's activities. In prokaryotes, nucleic acids are scattered throughout the cell.

Members of the domain Archaea, whose name comes from the Greek word for "ancient," can be found in some of the most extreme environments on Earth, including hot springs, very salty water, swamps, and the intestines of cows! Scientists think that the harsh conditions in which archaea live are similar to those of ancient Earth. Like bacteria, archaea are unicellular prokaryotypes. And like bacteria, some archaea are autotrophs while others are heterotrophs. **Although bacteria and archaea are similar in some ways, there are important differences in the structure and chemical makeup of their cells.**

Members of the domain Eukarya are **eukaryotes**—organisms with cells that contain nuclei. **Scientists classify organisms in the domain Eukarya into one of four kingdoms: protists, fungi, plants, or animals.**

Slime molds are protists. The protist kingdom is sometimes called the "odds and ends" kingdom because its members are so different from one another. Protists can be autotrophs or heterotrophs. Although many protists are unicellular, some, such as seaweeds, are multicellular.

Mushrooms, molds, mildew, and yeast are all fungi. Most fungi are multicellular eukaryotes. A few, such as yeast, are unicellular eukaryotes. Fungi are found almost everywhere on land, but only a few live in fresh water. All fungi are heterotrophs. Most fungi feed by absorbing nutrients from dead or decaying organisms.

Plants are all multicellular eukaryotes. The plant kingdom includes a variety of organisms. In general, plants are autotrophs and feed almost all of the heterotrophs on land.

All animals are multicellular eukaryotes. All animals are heterotrophs. Animals have different adaptations that allow them to find food, capture it, eat it, and digest it. Members of the animal kingdom are found in diverse environments on earth.

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This section describes each of the domains and kingdoms into which all living things are grouped.

Use Target Reading Skills

As you read, compare and contrast the characteristics of organisms in domains Bacteria, Archaea, and Eukarya by completing the table below.

Domain or Kingdom	Cell Type and Number	Able to Make Food?
Bacteria	Prokaryote; unicellular	
Archaea		
Eukarya: Protist		
Fungi		
Plants		
Animals		

1. List the three domains of living things.

    a. _____ b. _____

    c. _____

2. Complete the concept map to show how organisms are placed into domains and kingdoms.

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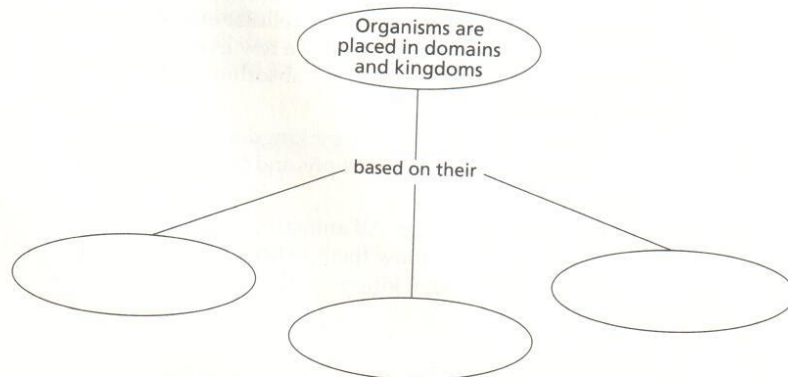
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Domain Bacteria

3. Circle the letter of each sentence that is true about bacteria.

   a. Bacteria can be either autotrophic or heterotrophic.
   b. Bacteria are prokaryotes.
   c. Bacteria have a cell nucleus.
   d. Bacteria do not have nucleic acids.

4. A dense area in a cell that contains nucleic acids is a(n)
   _____.

Domain Archaea

5. Is the following sentence true or false? Archaea have a similar chemical
   makeup to bacteria. _____

6. Why are members of this domain called archaea, which comes from the
   Greek word for "ancient"?

   _____

   _____

   _____

Domain Eukarya

7. Is the following sentence true or false? Protists can be either unicellular
   or multicellular. _____

8. How do protists differ from bacteria and archaea?

   _____

   _____

   _____

9. Is the following sentence true or false? Mushrooms, molds, mildew, and
   yeast are all fungi. _____

10. Circle the letter of each characteristic of fungi.

    a. eukaryotes   c. autotrophs
    b. prokaryotes   d. heterotrophs

11. Plants are _____; they can make their own food.

12. Is the following true or false? Plants provide food for all the heterotrophs on
    Earth. _____

13. Circle the letter of each characteristic of animals.

    a. unicellular   c. eukaryotes
    b. heterotrophs   d. autotrophs

14. Is the following sentence true or false? All animals are multicellular.

    _____