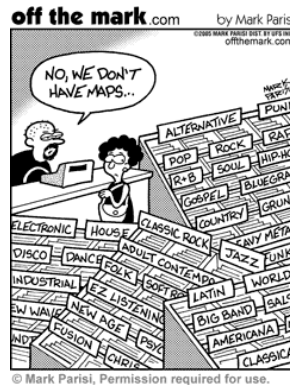


An Introduction to Classification



Taxonomy is a discipline in which scientists classify organisms and assign them a universally accepted name. Classification previously relied on physical characteristics to group organisms.

Questions:

1. Provide an explanation as to why it is necessary to classify organisms.
It is necessary to classify organisms in order to organize them into groups and to determine evolutionary relationships.
2. Recall homologous and analogous structures; which could be used as evidence of evolution? Why?
Homologous structures are evidence of evolution as the similar structures indicate common ancestry.
3. What are some drawbacks of relying on physical characteristics to group organisms?
(Hint: Recall the shark, dolphin and human example)

Physical characteristics can be misleading due to damage from the elements or sharing structures with similar functions due to living in a similar environment.

In the UK, a buzzard refers to a hawk whereas in the U.S. it refers to a vulture.

4. Identify problems with using common names such as “buzzard” to identify organisms from one country to the next.

The term “buzzard” refers to different species in different parts of the world, which can lead to confusion.

5. Provide a possible solution to the confusion of common names.

Instead of using common names, a standard system of naming could be used throughout the world.

A botanist by the name of Carolus Linnaeus developed a universal system known as **binomial nomenclature**

6. Using your knowledge of prefixes, define bi-.

The prefix bi- means two.

7. What other word does –nomial sound like (use your knowledge of Spanish, Italian etc. to help you with this)

This sounds like the Latin word for name.

*binomial nomenclature is a two-name naming system.

8. This system of binomial nomenclature uses Latin. What benefits are there to using this language?

Latin is a dead language and therefore remains constant.

The first name in this system is always an organism’s genus name and it is Capitalized. The second name is always the species name and is lowercase. Both words should be *italicized* if typed or underlined if written.

9. The scientific name for the house cat is *Felis domesticus*. Identify the genus and species name here.

Genus- *Felis*

Species- *domesticus*

10. What is the scientific name for humans?

Homo sapien is the scientific name for humans.

Linnaeus's System of Classification included seven groupings, which can be remembered using the saying **King Phillip Came Over For Great Sandwiches**

11. What do each of the following letters represent?

K = Kingdom

P= Phylum

C= Class

O= Order

F= Family

G= Genus

S= Species

12. Which category has the greatest biodiversity? The least?

Kingdoms are the broadest categories and therefore have the most biodiversity or variety within them. Species is the most specific as members of the same species are the most genetically similar, with only slight genetic variations.

Evidences of evolution are also used to classify organisms more accurately than by physical characteristics alone. They include biochemistry, cytology, embryology, and anatomy.

Modifications to the Five-Kingdom System of Classification

Recent evidence provided by rRNA (ribosomal RNA, a form of genetic material) has suggested that a broader grouping is necessary above kingdom. This grouping is referred to as a **domain**. All life as we know it now can be grouped into three distinct domains: **Bacteria, Archaea and Eukarya**.

11. Use pages 459-461 in the textbook to complete the chart below:

Domain	Pro/eukaryotic	Uni/multicellular or both	Type(s) of nutrition	Environments
Bacteria	Prokaryotic (no organized nucleus)	unicellular	Autotrophic/heterotrophic	Everywhere except extreme environments
Archaea	prokaryotic	unicellular	Autotrophic/heterotrophic	Extreme environments such as areas with high salt, extreme pH and temperature
Eukarya	Eu = true Eukaryotes have a true organized nucleus	Uni & multicellular	Autotrophic / heterotrophic	Land, water, etc except extreme environments

The domain **Eukarya** is further divided into **four kingdoms: Protista, Fungi, Plantae and Animalia**

Using pages 460-461 in the textbook complete the tree diagram below:

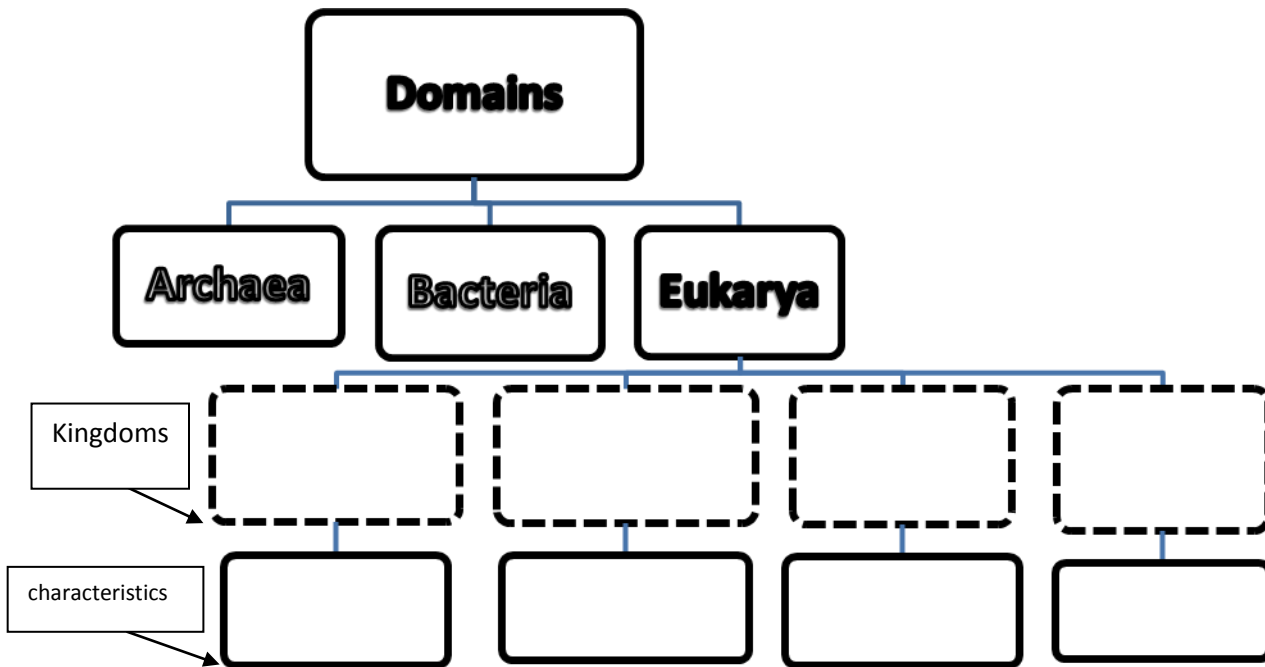


Figure 1. Three domains and Characteristics of the Four Eukarya Kingdoms

Kingdom	Characteristics
Plant	Autotrophic and multicellular
Animal	Heterotrophic and multicellular
Protista	Uni or multicellular and can be autotrophic or heterotrophic
Fungi	Heterotrophic but have cell walls (made of different material than plant cell walls) and are multi or unicellular (the majority are multicellular) for example: mushrooms and yeast