

## TAXONOMY AND KINGDOMS OVERVIEW

**Taxonomy** is the branch of biology that is concerned with grouping and naming organisms.

Scientists use organize organisms using the following categories: domain, kingdom, phylum, class, order, family, genus, species. The sentence “Dear King Phillip Cried Ot For Good Soup” can help you remember the order of these categories from large to small.

The more categories two organisms share, the more closely related they are. Notice below that the cat and wolf are more closely related to each other than they are to a fly. Cats and wolfs are in the same kingdom, phylum, class, and order.



	Cat	Wolf	Fly
<b>Kingdom</b>	Animalia	Animalia	Animalia
<b>Phylum</b>	Chordata	Chordata	Arthropoda
<b>Class</b>	Mammalia	Mammalia	Insecta
<b>Order</b>	Carnivora	Carnivora	Diptera
<b>Family</b>	Felidae	Canidae	Muscidae
<b>Genus</b>	<i>Felis</i>	<i>Canis</i>	<i>Musca</i>
<b>Species</b>	<i>F. domesticus</i>	<i>C. lupus</i>	<i>M. domestica</i>

Scientists group and name organisms based on their similarities. Scientific names have two parts (binomial nomenclature)- the genus and the species. For example, humans are *Homo sapiens* (Homo= genus; sapiens= species).

Closely related organisms share their genus name. For example, you can tell that the polar bear (*Ursus maritimus*) and the grizzly bear (*Ursus arctos*) are closely related because they are both part of genus *Ursus*.



*Ursus maritimus*



*Ursus arctos*



*Ailuropoda  
melanoleuca*

There are three domains: Archae, Bacteria, and Eukarya. Archae and Bacteria contain prokaryotic organisms (which lack nuclei and other membrane-bound organelles). The two prokaryotic domains differ in their chemical makeup, cell wall composition, and response to antibiotics. Members of Eukarya are eukaryotic.

The key characteristics of each kingdom are summarized in the table below:

DOMAIN	KINGDOM	KEY CHARACTERISTICS	EXAMPLES
<b>Bacteria</b>	<b>Eubacteria</b>	Lack nuclei and other organelles (prokaryotes)	<i>E. coli</i> , <i>Salmonella</i>
<b>Archae</b>	<b>Archaeobacteria</b>	Lack nuclei and other organelles (prokaryotes); live in extreme environments	Bacteria that live in hot springs, volcanic vents, sulfur springs
<b>Eukarya</b>	<b>Protists</b>	Have nuclei and other organelles (eukaryotes); usually unicellular	Amoeba, paramecium, euglena
	<b>Fungi</b>	Have nuclei and other organelles (eukaryotes); usually multicellular; decomposers (feed on dead organisms); cell walls made of chitin	Mushrooms, molds, yeasts (unicellular)
	<b>Plants</b>	Have nuclei and other organelles (eukaryotes); multicellular; carry out photosynthesis; cells have cell walls made of cellulose	Moss, ferns, flowering plants, trees
	<b>Animals</b>	Have nuclei and other organelles (eukaryotes); multicellular; heterotrophs (consumers)- must feed on other organisms; mobile (can move); cells do NOT have cell walls	Sponges, jellyfish, worms, insects, fish, birds, reptiles, amphibians, mammals

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#### PRACTICE

- Which of these classifications is most specific?
  - Family
  - Phylum
  - Genus
  - Order
  
- The Ferruginous bird (*Buteo regalis*) is most closely related to which of the following?
  - Flesh-footed shearwater (*Puffinus carneipes*)
  - Fulvous whistling duck (*Dendrocygna bicolor*)
  - Fork-tailed storm petrel (*Oceanodroma furcata*)
  - Rough tailed hawk (*Buteo lagopus*)

3. An organism that is only one cell big and has a nucleus is most likely a member of which kingdom?
- Eubacteria
  - Archaeobacteria
  - Protista
  - Plantae
4. What process can plant cells carry out that animal cells cannot? \_\_\_\_\_
5. To which kingdom does each of the following belong?
- Dogwood tree-
  - Amoeba-
  - Bacteria that live in the hot sulfur springs of Yellowstone National Park-
  - Sponges-
  - Mushroom-
6. Which of these kingdoms consists of prokaryotic organisms?
- Eubacteria
  - Protists
  - Fungi
  - Plants
7. An organism that is multicellular, contains organelles, and produces its own nutrients to use as an energy source is most likely a member of which kingdom?
- Animalia
  - Fungi
  - Archae
  - Plantae
8. Which of the following would not be found in the kingdoms Protista, Fungi, Plantae, or Animalia?
- Eukaryotes
  - Prokaryotes
  - Single celled organisms
  - Multicellular organisms
9. The Texas longhorn cattle, *Bos bos*, evolved from an ancestor with the scientific name *Bos primigenius*. What can you conclude from this information?
- They are members of different families
  - They share their genus name
  - They share their species name
  - They belong to the same subspecies
10. What is an advantage of using an organism's scientific name rather than its common name?
- The scientific name is always given in the native language
  - The scientific name is based upon the organism's kingdom and phylum
  - The scientific name does not depend on any classification system
  - The scientific name clearly identifies the organism