

Taxonomy

Domain

Most Organisms
Least Specific Category

Kingdom

Phylum

Class

Order

Family

Genus

Most Specific Category Containing
More Than One Species

Species

Unique to a Single Organism



Asian Elephant
Elephas maximus

Asian Elephant

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Order: Proboscidea
Family: Elephantidae
Genus: *Elephas*
Species: *E. maximus*

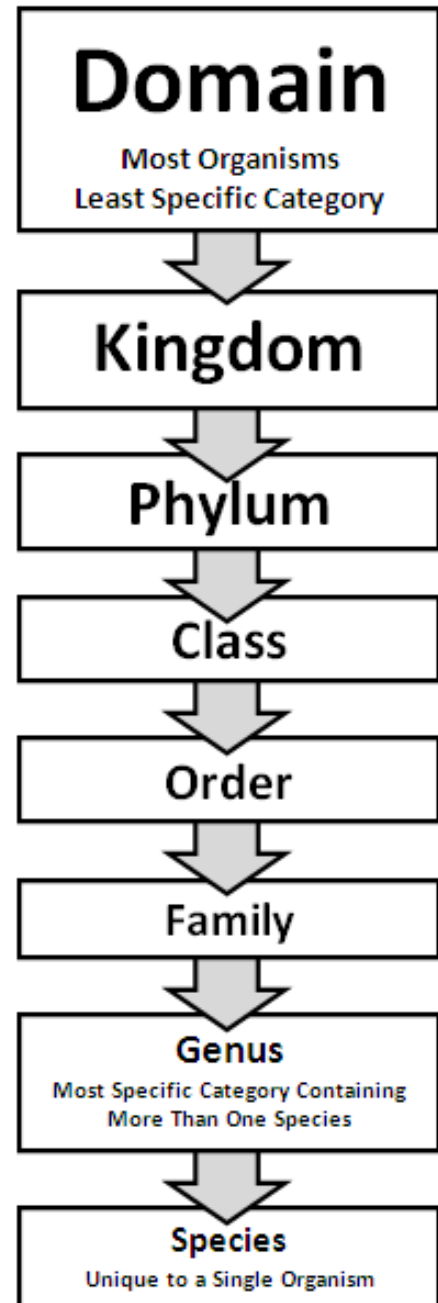
Common food sources:
Grasses, herbs, leaves, fruit
and other vegetation

Habitat: Live primarily in
forested areas

Taxonomy

Taxonomy is the science of defining groups of organisms based on shared characteristics.

Scientific names allow scientists all over the world to speak clearly about specific organisms and groups of organisms.



Taxonomy



Robin

(Europe)

Erithacus rubecula

Photo by Pierre Selim



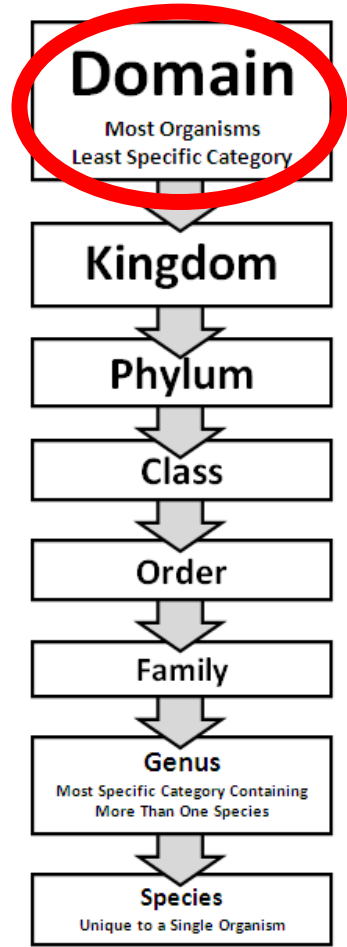
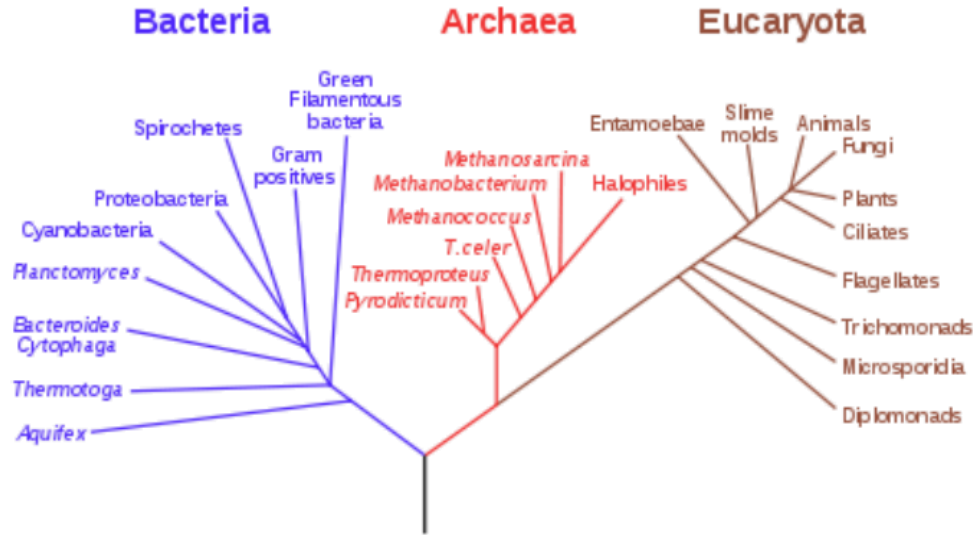
Robin

(America)

Turdus migratorius

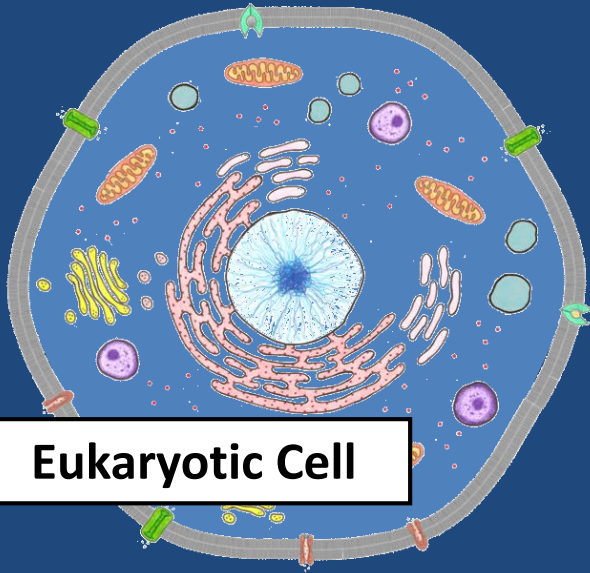
Each of these birds is called a **robin** in the part of the world where they live. These common names are confusing, but using their scientific names makes it clear which species is being discussed.

Phylogenetic Tree of Life



Domain is the largest taxonomic category, and there are only 3 domains: **eukarya**, **eubacteria**, and **archaea**.

Because domain is the largest category, it is also the *least specific*.



Eukaryotic Cell

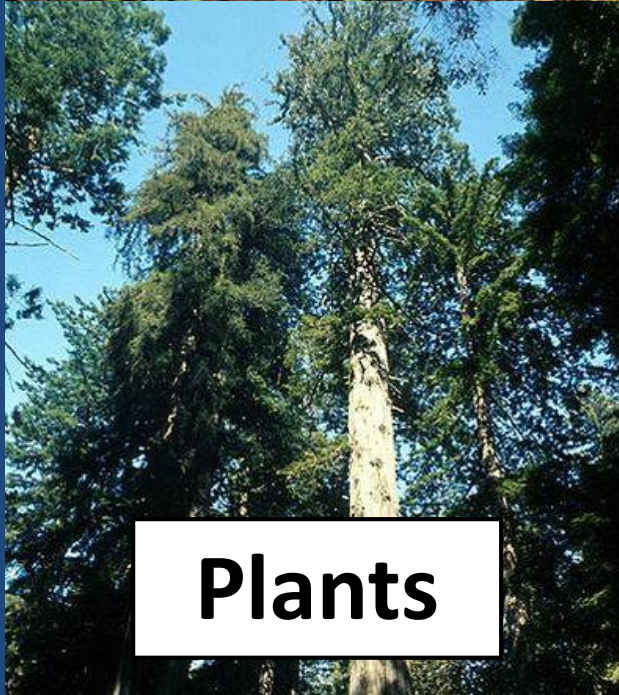


Fungus

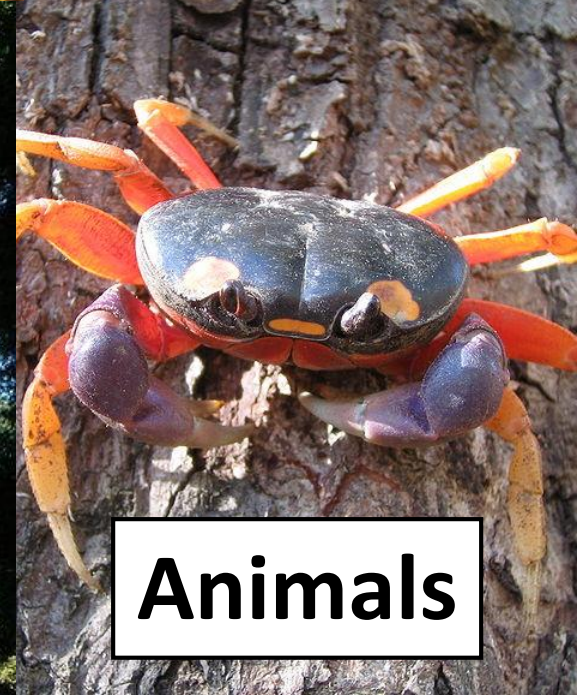


Protists

To be included in **Domain Eukarya**, organisms simply must be made of *eukaryotic cells*.



Plants

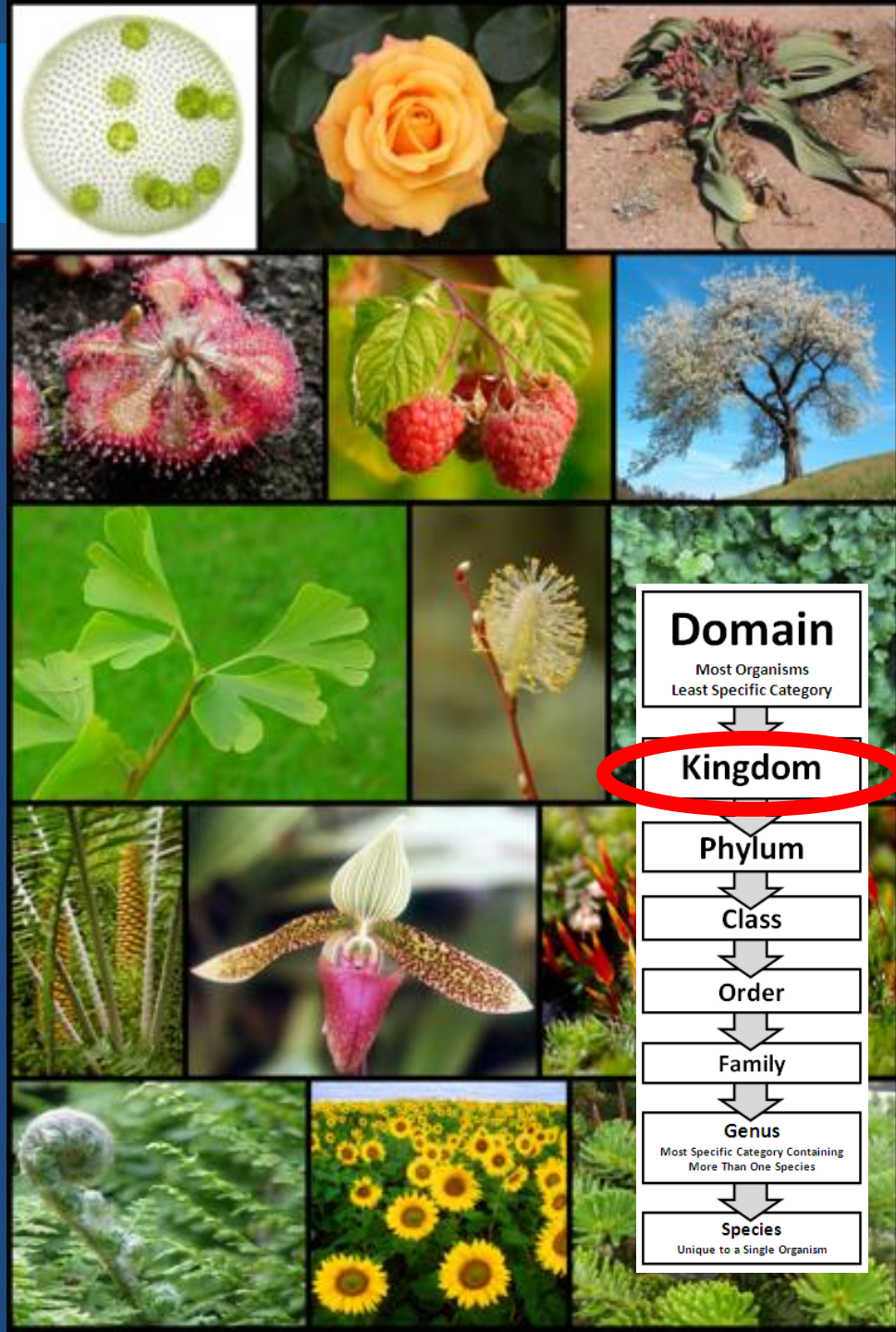


Animals

Taxonomy

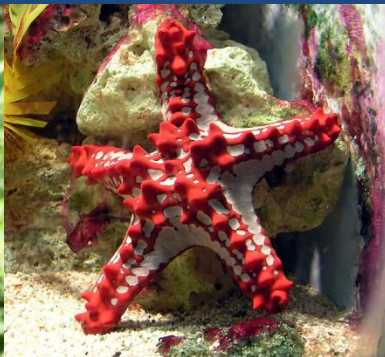
Kingdom is the next largest category.

Organisms in each kingdom have some basic characteristics in common, but they can also have plenty of differences.



The Animal Kingdom is in Domain Eukarya because animals are **eukaryotes**. They also have other very important but basic characteristics in common:

1. Animals are **multicellular**.
2. Animals are **heterotrophic**.
3. Animals are **highly mobile**.



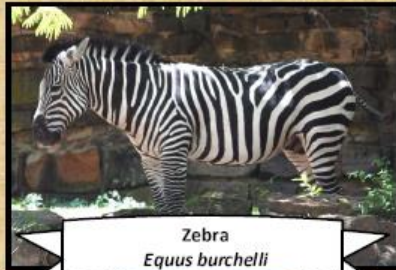
Each kingdom is broken up into smaller groups called **phyla**. Each **phylum** contains organisms that have been grouped together based on similarities.

All vertebrates are in **Phylum Chordata**.

Phylum Chordata



Green Jay
Cyanocorax yncas



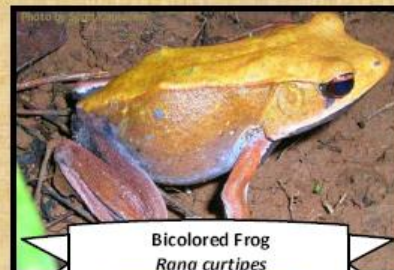
Zebra
Equus burchelli



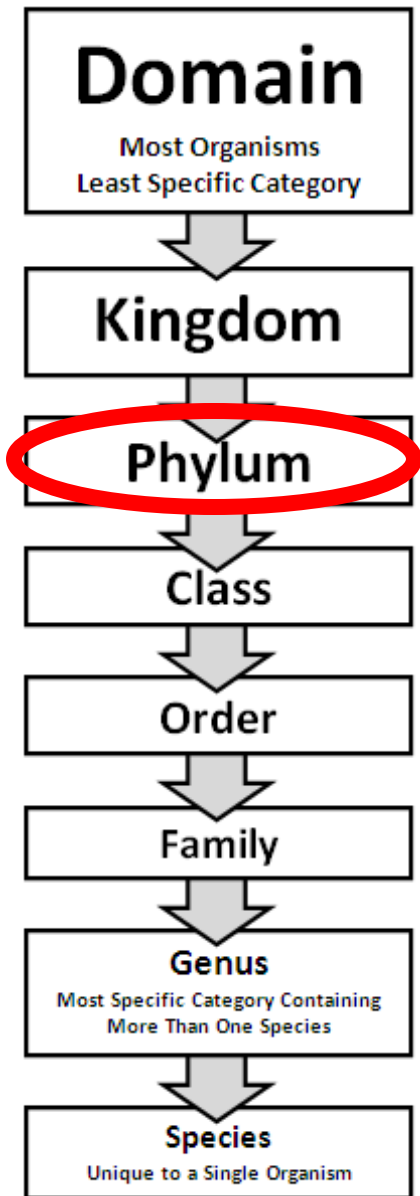
Texas Horned Lizard
Phrynosoma cornutum



Common Snapping Turtle
Chelydra serpentina



Bicolored Frog
Rana curtipipes



The members of **Phylum Arthropoda** are also members of the Animal Kingdom. They have been placed together into the same phylum because they have **jointed legs, segmented bodies** and **exoskeletons**.



Photo by André Karwath



Photo by Chris Hill



Photo by Eric Guinther



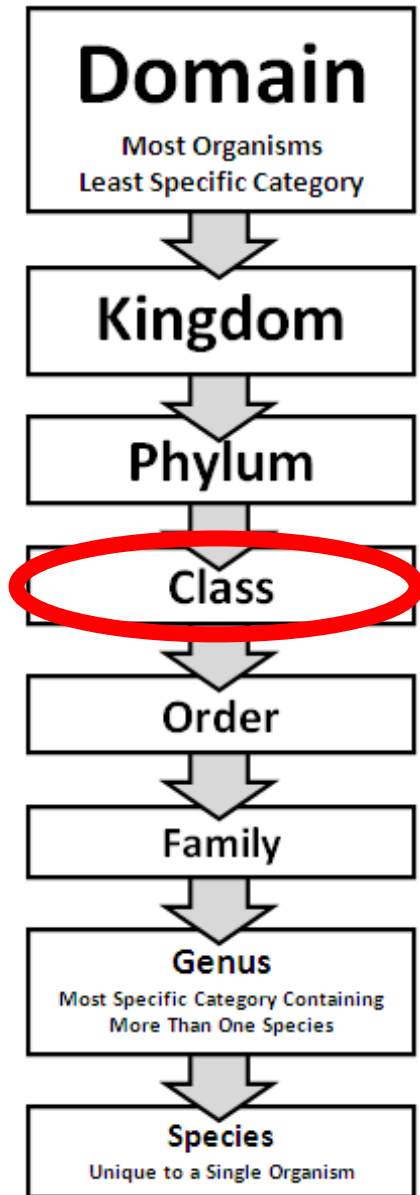
Photo by Dirk van der Made



Each phylum is then divided up into **classes**. These classes are often the familiar groupings that you learned in your childhood.

Class Reptilia (The Reptiles)

What do all these reptiles have in common?





Domain: Eukarya
Kingdom: Animalia
Phylum: Chordata
Class: Aves (Birds)

Domain: Eukarya
Kingdom: Animalia
Phylum: Chordata
Class: Mammalia



Domain: Eukarya
Kingdom: Animalia
Phylum: Arthropoda
Class: Insecta

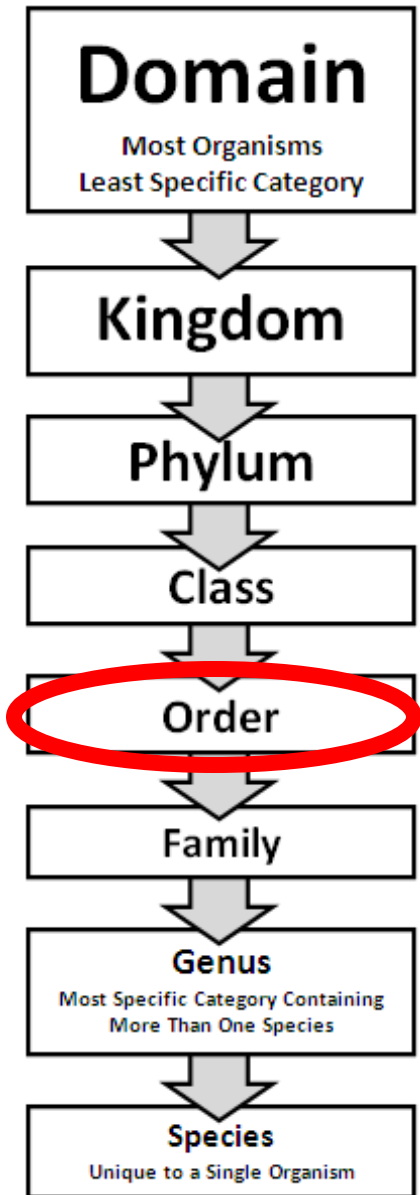
Photo by André Karwath

Photo by Thomas G. Moertel

Even though classes may seem like pretty specific categories, there can still be plenty of differences between these organisms. Organisms are placed into **orders** with organisms that more similar.



It is obvious that these are both insects (Class Insecta), but there are still obvious differences between them. These insects are placed into different orders based on their wing shape, mouth parts, etc.



Each order is then placed into very specific **families**. These families often have more similarities than differences, but there are still some differences.

Domain:
Eukarya

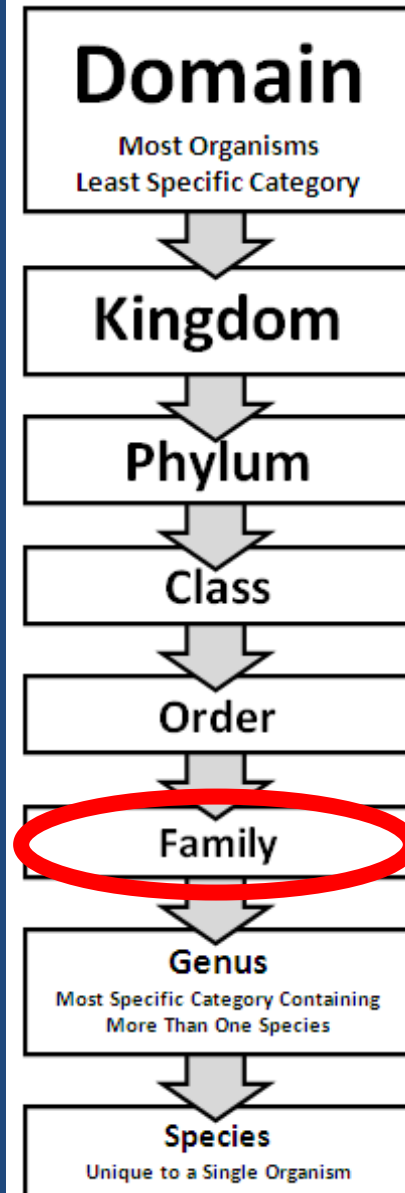
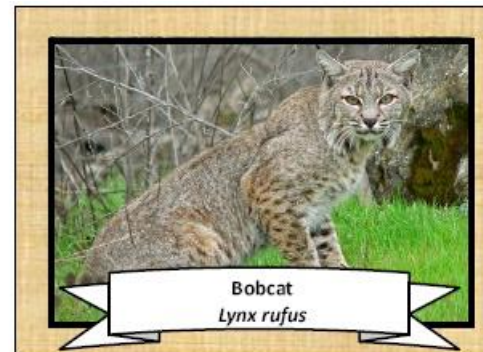
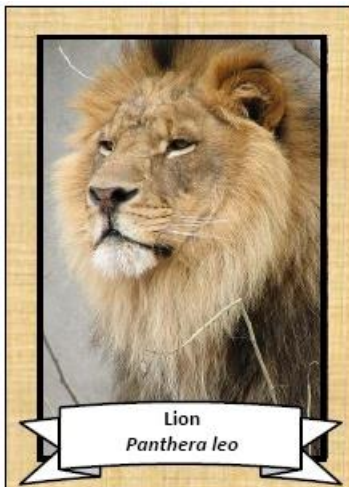
Kingdom:
Animalia

Phylum:
Chordata

Class:
Mammalia

Order:
Carnivora

Family:
Felidae



Within families, the most closely related species are placed into a **genus**. The organisms in the same genus may have very few differences.



American Paint Horse
Equus caballus

American Paint Horse
Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Order: Perissodactyla
Family: Equidae
Genus: *Equus*
Species: *caballus*

Common food sources:
Grasses, hay, oats

Habitat: The plains of America

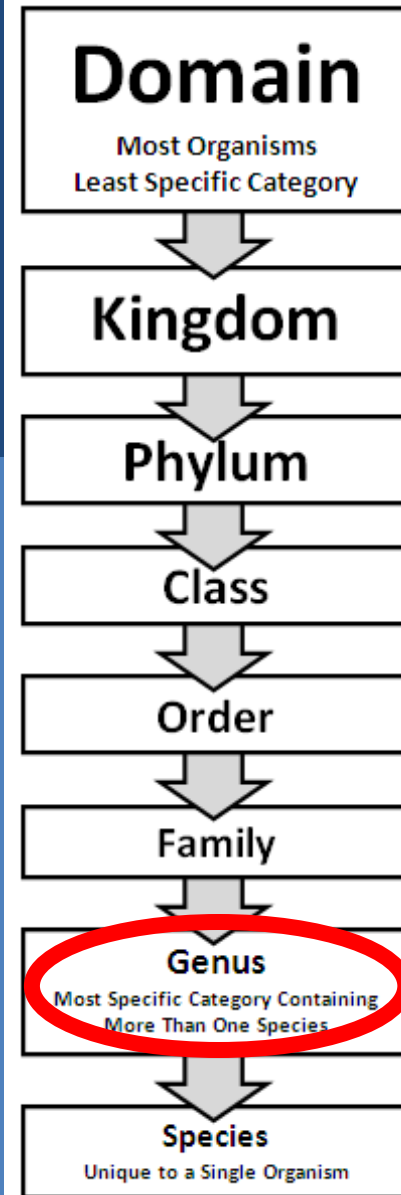


Zebra
Equus burchelli

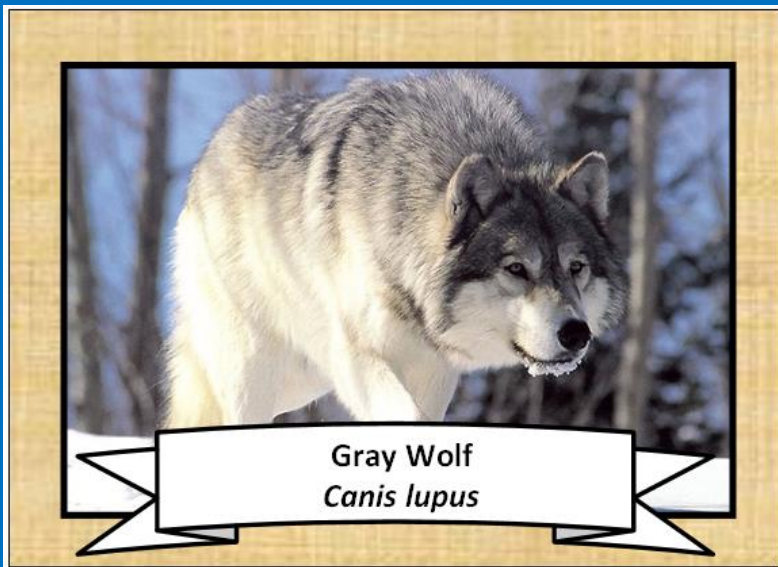
Zebra
Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Order: Perissodactyla
Family: Equidae
Genus: *Equus*
Species: *burchelli*

Common food sources:
Grasses, herbs, leaves and bark

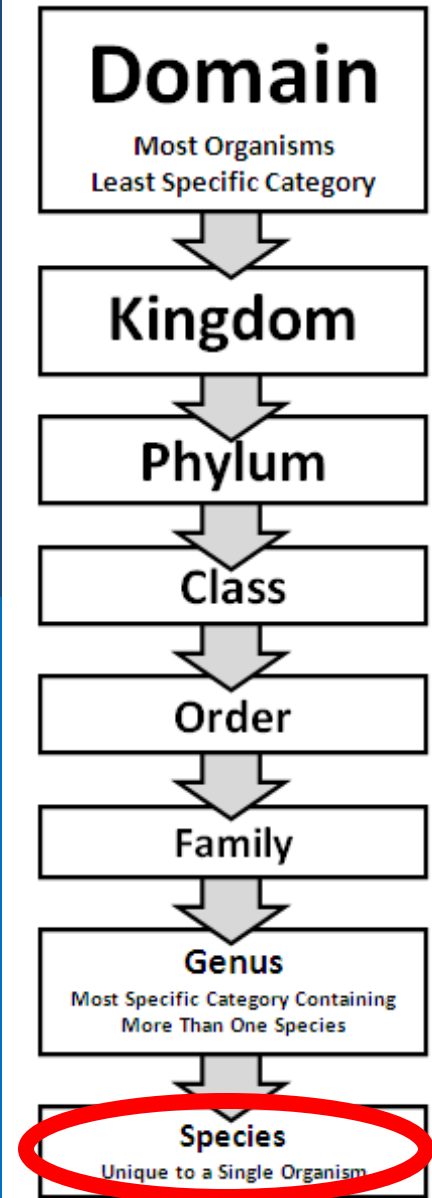
Habitat: The plains of Africa



Each species within a genus is given a unique *specific epithet*. When the name of a species is given, it is important that *both genus and species are used*. This can be shortened by using only the first letter of the genus.



The gray wolf's specific epithet is "lupus". However, the name of the species is "*Canis lupus*" or "*C. lupus*"

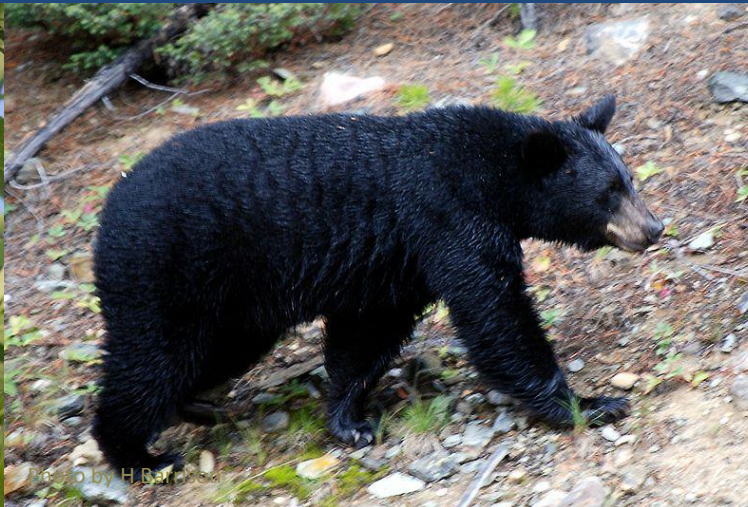


It is important to name a species using both *genus* and *specific epithet* so that there is no confusion about which species is being discussed. The specific epithet often notes the location of the species. Because of this, different species may use the same epithet if they are from the same region.

Yellow-billed Cuckoo
Coccyzus americanus



American Black Bear
Ursus americanus



Devilwood
Osmanthus americanus



The genus tells us what type of organism we are talking about while the specific epithet tells us that they are all found in America.

Taxonomy

Different species are considered to be more related to other species when they share a large number of taxonomic categories. The most closely related *organisms* are in the *same species*, but the most closely related *species* are in the *same genus*.

Black-Footed Cat
Felis nigripes



Domestic Cat
Felis silvestris



Taxonomy

When examining the relatedness of different organisms, it is important that you learn to **ignore common names**. On a test, these will **always** be used to confuse to you.

Dogs (*Canis familiaris*) are most closely related genetically to which of the following organisms?

- A ~~African hunting dog~~ (*Lycaon pictus*)
- B ~~Gray wolf~~ (*Canis lupus*)
- C ~~Grizzly bear~~ (*Ursus arctos*)
- D ~~Domestic cat~~ (*Felis catus*)

American bobtails (*Felis catus*) are a breed of domestic cat. Which of the following is most closely related to American bobtails?

- A ~~Lion~~ (*Panthera leo*)
- B ~~Black footed cat~~ (*Felis nigripes*)
- C ~~Andean mountain cat~~ (*Leopardus jacobitus*)
- D ~~Burmese cat~~ (*Felis catus*)

Taxonomy Mnemonic

Once upon a time, a rich merchant was told that he would be visited by King Philip. Knowing that Grape Soda was the King's favorite drink, the merchant was sure to have plenty on hand. The merchant went out to make some final preparations before the King's visit, and when he returned he noticed that some of the soda was gone.



The merchant went to the butler and asked, “**Did King Phillip Come Over For Grape Soda?**” The butler did not know, so the merchant asked the maid, “**Did King Phillip Come Over For Grape Soda?**” The maid did not know either, and the merchant was so anxious that he might have missed the king that his heart stopped and he fell dead on the spot. To this day, his ghost is said to haunt the house asking everyone who enters, “**Did King Phillip Come Over For Grape Soda?**”



What question did the merchant ask?

“Did King Phillip Come Over For Grape Soda?”

Did	Domain
King	Kingdom
Phillip	Phylum
Come	Class
Over	Order
For	Family
Grape	Genus
Soda	Species

Remembering
this question can
help you
remember the
order of the
Taxonomic
Categories.