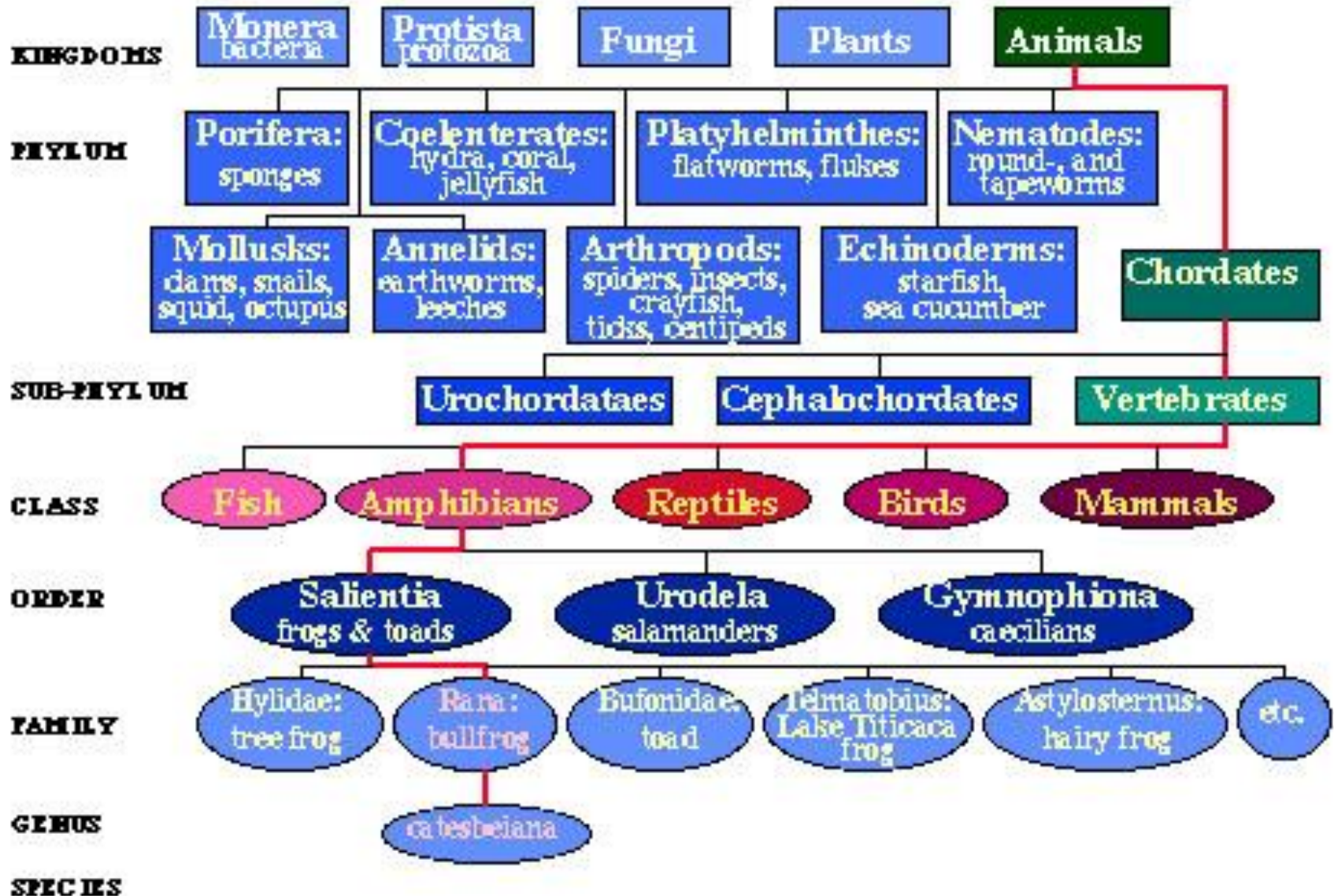


Classification

THE FIVE-KINGDOM SYSTEM OF BIOLOGICAL CLASSIFICATION



- * Biodiversity – the variety of organisms in an ecosystem.
 - * 10,000,000+ species known to exist today.
 - * Possibly 30,000,000+ species of insects alone.
- * Relationship between organisms determined by:
 - * Evolutionary relationship
 - * Biochemistry
 - * Behavior
 - * Developmental stages

Taxonomy – science of classifying organisms.

* Carolus Linnaeus (year 1735)

- * “father of modern taxonomy”
- * Based on structural similarities.
- * Only **two groups (plant & animal)** based on habitat and stem structure.
 - * Only recognized two Kingdoms: Plantae vs. Animalia



Classification

* **7 Levels of classification in modern system.**

* Can be used to classify all BUT asexually reproducing species

1. Kingdom (largest category, organisms are least similar)
2. Phylum
3. Class
4. Order
5. Family
6. Genus (smallest category, organisms most similar)
7. Species (down to a single organism!)

Grizzly bear	Black bear	Giant panda	Red fox	Abert's squirrel	Coral snake	Sea star
						

KINGDOM Animalia



PHYLUM Chordata



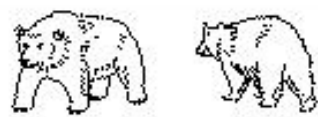
CLASS Mammalia



ORDER Carnivora



FAMILY Ursidae



GENUS Ursus



SPECIES *Ursus arctos*

TABLE 18-1 Classification Hierarchy of Organisms

	<u>Bobcat</u>	<u>Lion</u>	<u>Shaggy mane mushroom</u>
Kingdom	Animalia	Animalia	Fungi
Phylum/division	Chordata	Chordata	Basidiomycota
Class	Mammalia	Mammalia	Homobasidiomycetae
Order	Carnivora	Carnivora	Agaricales
Family	Felidae	Felidae	Copricaceae
Genus	<i>Lynx</i>	<i>Panthera</i>	<i>Coprinus</i>
Species	<i>Lynx rufus</i>	<i>Panthera leo</i>	<i>Coprinus comatus</i>



Which is more closely related to the ...



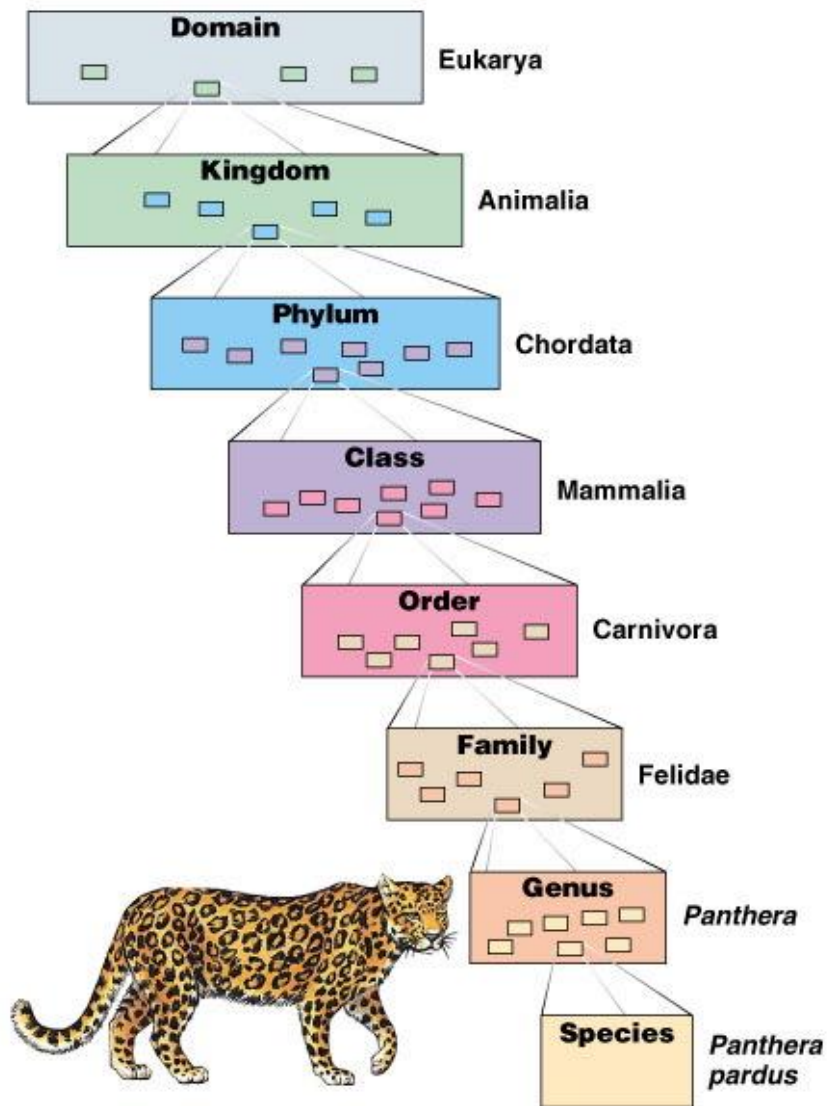


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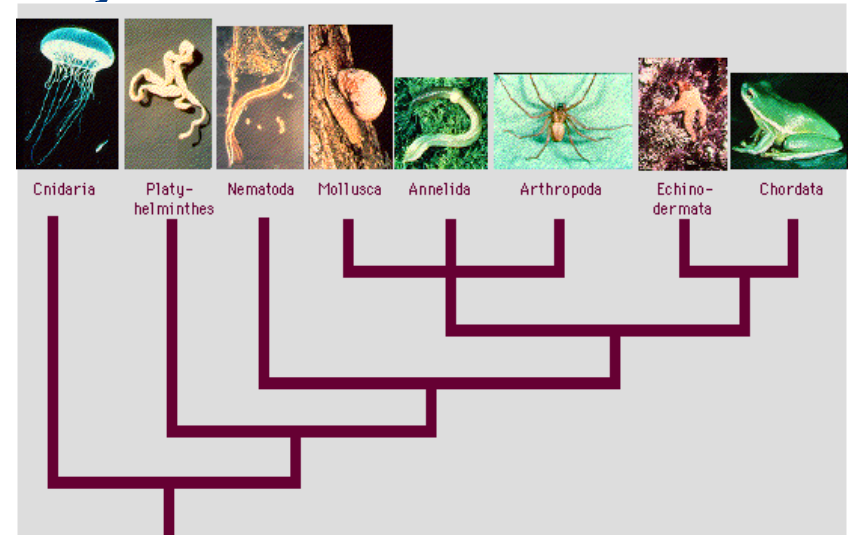


Binomial nomenclature – 2 name naming system.

- * “Genus & species”
- * First word capitalized, second word not.
- * Always italicized or underlined.
- * Always in Latin because...
 - * Dead language... It is universal
- * Example: *Homo sapien* or Homo sapien

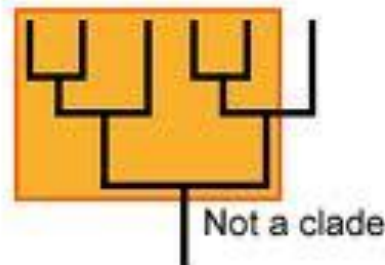
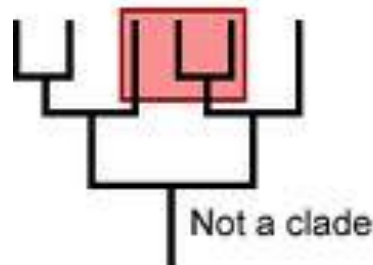
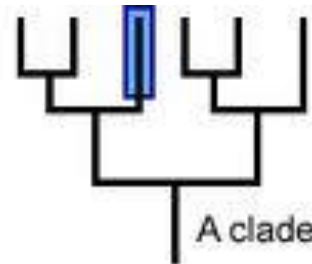
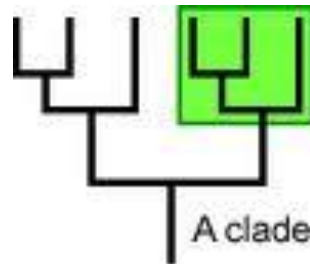
Classifying organisms based on Evolution

- * Phylogeny – the **evolutionary** relationship between organisms.
- * Cladogram / Phylogenetic Tree- looks like family tree, used to show evolutionary history of organisms
- * Evidence of shared ancestry:
 - * Fossil records
 - * Homologous features
 - * Embryological evidence



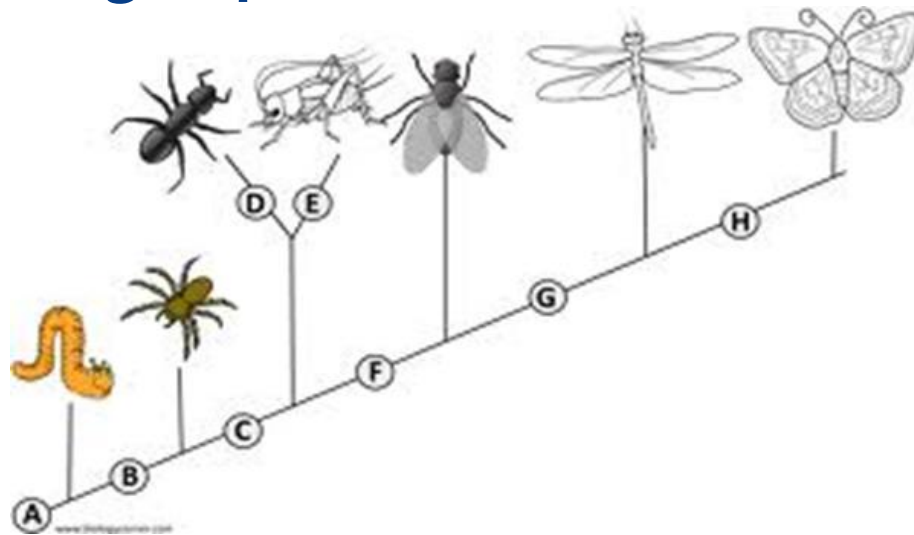
Cladistics (Cladograms)

- Organisms are grouped into **clades**
 - A clade is a group of species that includes an ancestral species and all of its descendants
- Based on a new trait developing and being passed down to descendants
 - Groups of organisms that share these new traits are more closely related to each other than to groups who only have ancestral traits

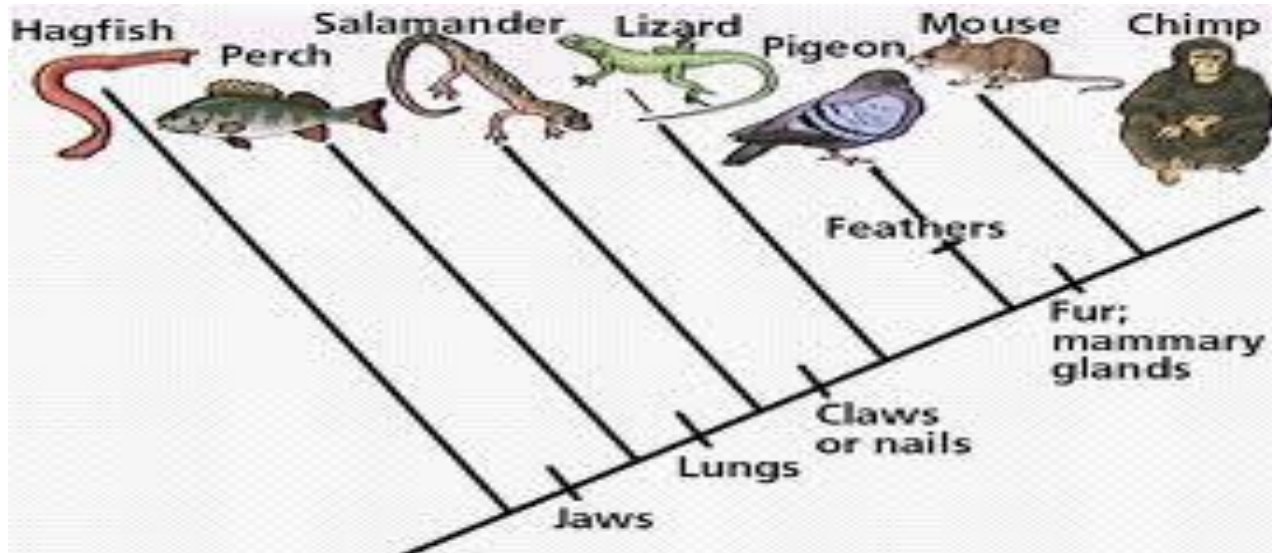


Making Cladograms / Phylogenetic Trees

- * **Shared derived characters** – new traits that are shared by a group
 - * These shared derived characters distinguish between clades and are “branches” in the tree of life (and branches in cladograms)
- * **Shared ancestral characters** – original traits present in ancestral groups



	hagfish	perch	salamander	lizard	pigeon	mouse	chimp
Fur; mammary glands	0	0	0	0	0	1	1
Feathers	0	0	0	0	1	0	0
Claws or nails	0	0	0	1	1	1	1
Lungs	0	0	1	1	1	1	1
Jaws	0	1	1	1	1	1	1



Dichotomous key

- * "divided into two choices"
- * looks at the similarities and differences
- * leads the user to the organism's name



MONEY TAXONOMIC KEY

- 1 A. Metal.....go to 2
- 1 B. Paper.....go to 5
- 2 A. Brown (copper).....penny
- 2 B. Silver.....go to 3
- 3 A. Smooth edge.....nickel.
- 3 B. Ridges around the edge.....go to 4
- 4 A. Torch on back.....dime
- 4 B. Eagle on back.....quarter
- 5 A. Number 1 in the corners.....\$1 bill
- 5 B. Number 2 in the corners.....\$2 bill