Classification / Taxonomy

 In order to work with such a diversity of life it is useful to have a system of biological classification that <u>names</u> and orders organisms in a <u>logical</u> manner.

Classification is important because:

- It assigns a world wide accepted name to each organism
- It places organisms into groups that have biological meaning. (When we say "bird" or "fish" we have an idea of what type of organism we are discussing about.)

- The Swedish botanist <u>Carolus</u>
 <u>Linnaeus</u> developed a system of naming plants and animals that is still used today.
- This system is known as <u>binomial</u> <u>nomenclature</u>.

Binomial Nomenclature Rules

- Each organism has a <u>two-part</u> scientific name.
- The language <u>Latin</u> is still used to name organisms. The genus name is <u>capitalized</u>, but not the species name. Both the genus and species names are *italicized* or <u>underlined</u>.
- Example: *Homo sapiens* or <u>Homo sapiens</u>

 Linnaeus also grouped organisms together by similar body structure. These groups are called <u>taxa</u> or (singular: <u>taxon</u>).

Taxonomy

 Taxonomy is the science of naming organisms and assigning them to groups (taxa).

An example of the 8 Taxa

Domain	Eukarya
Kingdom	Animalia
Phylum	Chordata
Class	Mammalia
Order	Carnivora
Family	Felidae
Genus	Felis
Species	domesticus

 The taxon species is the only one that has a clear biological identity. Members of the same species can **breed** with one another and produce offspring that in turn mate and produce more offspring.

Mule / Liger

- Mules come from male donkey x female horse
- Ligers come from male lion x female tiger

 Scientists can classify organisms by similar structures in the adult organisms. Scientists try to group organisms that show their evolutionary relationships. Species that are closely **related** are classified together.

- Other species that look alike but possess <u>analogous</u> structures only are classified in different groups.
- Analogous means organisms that have similar looking structures but have different origins and internal structures.
- Examples: bird wings vs butterfly wings

 Today we can also examine biochemical similarities. This may involve examining the organism's <u>DNA</u> and /or the <u>amino acid</u> sequence.

The Five Kingdoms

- Linnaeus only created two kingdoms: Animalia and Plantae. However, your textbook describes five kingdoms in order to group all the diverse organisms.
- The five kingdoms are <u>Monera, Protista</u>, <u>Fungi, Plantae, and Animalia</u>.

Kingdom Monera

- They include all the prokaryotes, which means they lack <u>nuclei</u>, <u>mitochondria</u>, and <u>chloroplasts</u>.
- They are <u>single</u>-celled organisms and reproduce by <u>binary fission</u>.
- An example from this kingdom would be <u>bacteria.</u>
- ***Note: This kingdom has been reorganized and is not used anymore.

Kingdom Protista

- The organisms in this kingdom are <u>single</u>celled organism.
- They are also <u>eukaryotic</u>, which means they possess a <u>nucleus</u> and membrane-bound <u>organelles</u>. Kingdom Protista is also divided into three groups: <u>fungus-like</u> protists, <u>plant-like</u> protists, <u>animal-like</u> protists.
- An example from this kingdom would be diatoms, paramecium, amoebas.

Kingdom Fungi

- The members in this kingdom have cell walls that do not contain <u>cellulose</u>. Fungi are <u>heterotrophic</u> and do not carry on <u>photosynthesis</u>.
- Heterotrophic means an organism that cannot produce its own food and instead it obtains energy by consuming other organic material.
- Fungi have <u>nuclei</u> but do not always have separate cells divided by cell walls.
- An example from this kingdom would be <u>mushrooms & molds</u>.

Kingdom Plantae

- The members in this kingdom are <u>multicellular</u>. They have cell walls that contain <u>cellulose</u>. They are also <u>autotrophic</u> and carry on <u>photosynthesis</u> using chlorophyll. Autotrophic means an organism that uses an energy source (sun) to produce its own from from simple inorganic sources (water & CO₂)
- An example from this kingdom would be <u>trees</u>, <u>grasses</u>, etc.



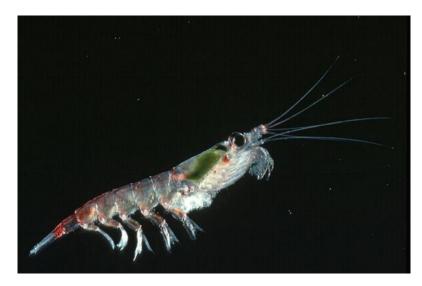


Kingdom Animalia

- The members in this kingdom are <u>multicellular</u>, <u>heterotrophic</u> and cells that do not have a <u>cell wall</u>.
- An example from this kingdom would be <u>dogs</u>, <u>cats</u>, tigers, monkeys, humans, etc.









Dichotomous Keys Assignment

- Scientists use dichotomous keys to identify organisms based on their physical characteristics
- Cut out your organisms & create a dichotomous key.
- Write down the characteristic you use that always divides the group into 2 groups or branches. Keep doing this until you end up with only individual organisms
- Use only physical characteristics that are observable
- Can you identify which organisms might be in similar genera or families?
- Present to the class and explain your how you organized your creatures the way you did. Make up scientific names for your organisms/creatures.
- Bonus: Make up scientific names for your organisms/creatures!