Classification

**Species of Organisms**

* There are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ billion known species of organisms
* This is only 5% of all organisms that ever lived!!!!!
* ­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organisms are still being found and identified

**What is Classification?**

* Classification is the ­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of organisms into orderly groups based on their similarities
* Classification is also known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Taxonomists are scientists that identify & name organisms

**Benefits of Classifying**

* Accurately & uniformly names organisms
* Prevents misnomers such as starfish & jellyfish that aren't really fish
* Uses same language (Latin or some Greek) for all names

**Carolus Linnaeus**: **1707 – 1778**

* 18th century \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Classified organisms by their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Developed naming system still used today
* Called the “Father of Taxonomy”
* Developed the modern system of naming known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ nomenclature
* Two-word name (Genus & species)

**Standardized Naming**

* Binomial nomenclature used
* *Genus species*
* Latin or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* *Italicized* in print
* Capitalize Genus, but NOT species
* Underline when writing

**Rules for Naming Organisms**

* The *International Code for Binomial Nomenclature* contains the rules for naming organisms
* All names must be approved by International Naming Congresses (International Zoological Congress)
* This prevents \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ names

**Classification Groups**

* Taxon ( taxa-plural) is a category into which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organisms are placed
* There is a hierarchy of groups (taxa) from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to most \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Domain, Kingdom, Phylum, Class, Order, Family, *Genus, species*

**Hierarchy-Taxonomic Groups**

* Domain (broadest)
* Kingdom
* Phylum
* Class
* Order
* Family
* Genus
* Species (most specific)

D\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ K\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ P\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ C\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ O\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_F\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ G\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!

**Domains**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, most inclusive taxon
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ domains
* Archaea and Eubacteria are unicellular prokaryotes (no nucleus or membrane-bound organelles)
* Eukarya are more complex and have a nucleus and membrane-bound organelles

**ARCHAEA**

* Probably the 1st cells to evolve
* Live in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ environments
* Found in:
  + Sewage Treatment Plants
  + Thermal or Volcanic Vents
  + Hot Springs or Geysers that are acid
  + Very salty water (Dead Sea; Great Salt Lake)

**EUBACTERIA**

* Some may cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Found in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ except harsh ones
* Important decomposers for environment
* Commercially important in making cottage cheese, yogurt, buttermilk, etc.

**Domain Eukarya is Divided into Kingdoms**

* Protista (protozoans, algae…)
* Fungi (mushrooms, yeasts …)
* Plantae (multicellular plants)
* Animalia (multicellular animals)

**Protista**

* Most are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_---
* Some are multicellular
* Some are autotrophic, while others are heterotrophic
* Aquatic

**Fungi**

* Multicellular, except \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Absorptive heterotrophs (digest food outside their body & then absorb it)
* Cell walls made of chitin

**Plantae**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Autotrophic
* Absorb sunlight to make glucose – Photosynthesis
* Cell walls made of cellulose

**Animalia**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Ingestive heterotrophs (consume food & digest it inside their bodies)
* Feed on plants or animals

**Taxons**

* Most genera contain a number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-- species
* The genus *Homo* is an exception (only contains modern humans)
* Classification is based on evolutionary \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Basis for Modern Taxonomy**

* Homologous structures (same structure, different function)
* Similar embryo development
* Molecular Similarity in *DNA*, *RNA*, or *amino acid* sequence of Proteins

**Cladogram**

* Diagram showing how organisms are related based on shared, derived characteristics such as feathers, hair, or scales

**Dichotomous Key**

* Used to identify organisms
* Characteristics given in pairs
* Read both characteristics and either go to another set of characteristics OR identify the organism