CLASSIFICATION

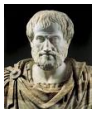
Classification
= the grouping of objects or organisms based on a set of criteria.

TAXONOMY

= A branch of biology that groups and names organisms.

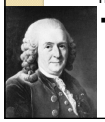
I. History

A. **Aristotle** (384-322 B.C.)
- Greek philosopher
- 1st method of classification
  - 2 groups: **plants** & **animals**



I. History

B. **Carolus Linnaeus** (1707-1778)
- Swedish botanist
- System we still use today
- **Binomial nomenclature** (2 word naming system)
- Every living organism has a genus name and a species name!



Genus & Species Name:

- Genus species:
  - scientific name Ex: *Homo sapiens*
    - common name Ex: = **human beings**
  - scientific name Ex: Acinonyx jubatus
    - common name Ex: *Cheetah*

Genus & Species Name:

- Writing scientific names (genus & species):
  - The **genus** name is **capitalized**; the species name is **lowercase**
  - Both genus and species names are always:
    - **Underlined** or **Italicized**

II. Why are living things organized?

- Provides **logic** and **organization**
- **Universal** understanding-useful tool
- Important to **economy**-discoveries!
  - New sources of lumber, medicines, energy, etc..

III. How are living things classified?

A. ***Taxa***- series of categories, each one larger than the previous one
- **Species** (only one)
- **Genus**
- **Family**
- **Order**
- **Class**
- **Phylum**
- **Kingdom**
- **Domain**(Very Broad Category)

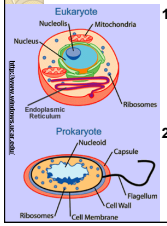
III. How are living things classified?

B. Classified by similarities in:
1. **Developmental** stages
2. **Biochemical** analysis (DNA)
3. **Behavioral** patterns

IV. DOMAINS:

- Organisms are classified into **domains** according to *cell type* and *structure*
- Organisms are classified into **kingdoms** according to *cell type*, *structure*, and *nutrition*

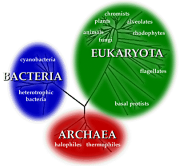
2 Cell Types:



1) **Eukaryotic cells** = have membrane-bound nucleus and organelles; usually more complex than prokaryotic cells
2) **Prokaryotic cells** = does NOT have a nucleus or other membrane-bound organelles

3 Domains:

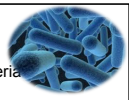
1) Bacteria
2) Archea (pronounced- ar KEE uh)
3) Eukarya



A. Bacteria

- Prokaryotes
- Cell walls contain peptidoglycan (polymer of sugars)
- Contains Kingdom Bacteria

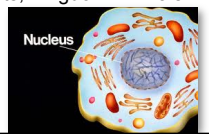
B. Archea



- More ancient than bacteria
- Prokaryotes
- Cell walls **DO NOT** contain peptidoglycan
- Live in **extreme** environments
  - Boiling hot springs, salty latkes, thermal vents on the oceans' floors, mud of marshes where there is NO oxygen

C. Eukarya

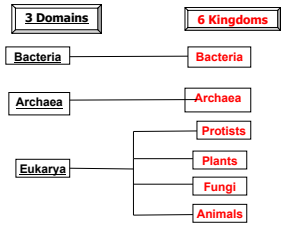
- Eukaryotes
- Contains Kingdom Protists, Kingdom Fungi, Kingdom Plants, Kingdom Animals



V. THE SIX KINGDOMS:

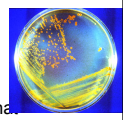
1. **BACTERIA**
2. **ARCHAEA**
3. **PROTISTS**
4. **FUNGI**
5. **PLANTS**
6. **ANIMALS**

Flow Chart of Domains & Kingdoms:



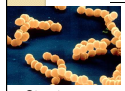
A. BACTERIA

- Cell type –**prokaryote**
- Cell walls with peptidoglycan
- Unicellular
- Autotroph (organism that makes their own food) or heterotroph (organism that gets its nutrients by feeding on other organisms)



BACTERIA (continued)

- Common bacteria
  - Ex: bacteria you would find on your skin
  - Ex: streptococcus bacteria causes strep throat
  - Ex: ***E. coli***


Streptococcus


E. Coli

B. ARCHAEA

- Cell type –**prokaryote**
- Cell walls **DO NOT** contain peptidoglycan
- Unicellular
- Autotroph or heterotroph

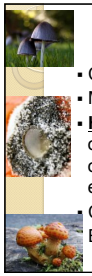

Hot Springs


Deep Sea Vents

C. PROTISTS

- Most **diverse** group
- Cell type – eukaryote
- Unicellular and multicellular
- Some **plant-like**, **animal-like** and **fungus-like**
- DO NOT have **organs**
- Usually live in **moist** environments
- Ex: **paramecium**, slime mold, **kelps**

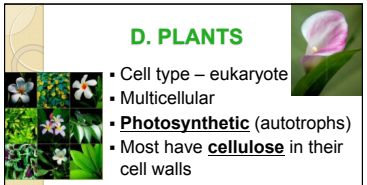
C. FUNGI



- Cell type – eukaryote
- Most multicellular
- **Heterotrophic** - absorb nutrients obtained by **decomposing** dead organisms and wastes in environment
- Cell walls with chitin (polymer)

Ex: **mushrooms**, **molds**

D. PLANTS



- Cell type – eukaryote
- Multicellular
- **Photosynthetic** (autotrophs)
- Most have **cellulose** in their cell walls
- **Tissues** organized into **organs** (roots, stems, leaves)

E. ANIMALS

- Cell type – eukaryote
- Multicellular
- Consumers that **eat** and digest **other organisms** for food
- No **cell walls**
- Have tissues organized into complex organ systems

Kingdom Characteristics

Domain	Bacteria	Archaea	Eukarya			
Kingdom	Bacteria	Archaea	Protists	Fungi	Plants	Animals
Cell Type	Prokaryotic		Eukaryotic			
Cell Walls	Contains peptidoglycan	Does NOT contain peptidoglycan	Some with cellulose	Chitin	Cellulose	NO Cell walls
Number of Cells	Unicellular		Unicellular & Multicellular	Most Multicellular	Multicellular	
Nutrition	Autotroph or heterotroph			Heterotroph	Autotroph	Heterotroph

Page 6- Identifying Beans using a dichotomous Key

Pinto Bean

White Northern

Kidney Bean

Identifying Beans using a dichotomous Key

Black Bean

Garbanzo Bean