

Class2017.notebook December 04, 2017

Classification

- Groupings of different types of organisms based upon similarities in structure and evolutionary relationships

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Taxonomy

the branch of biology that groups and names organisms based on studies of their different characteristics.

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How Classification Began

- Aristotle's system:** (384-322 B.C.)
classified all the organisms he knew into two groups: plants and animals.
- * **Carolus Linnaeus** (1707-1778)
system was based on physical and structural similarities of organisms.

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Linnaeus's system of binomial nomenclature

- a 2 name system for writing scientific names**
(Taxonomists are required to use Latin) WHY? does not change

- Genus: first word, Uppercase, covers a group of related species
- Species: second word, lowercase, refers to a species within a genus

Both are italicized in print or underlined when written

Example- Homo sapien
- Canis lupus

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Scientific and common names

- a common name can be misleading. For example, a sea horse is a fish, not a horse.
- In addition, it is confusing when a species has more than one common name




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Common names can be misleading

Ex:
 A jellyFISH isn't a fish,
 but a seaHORSE is!




Image from: <http://en.wikipedia.org/wiki/Jellyfish>



Sea cucumber
sounds like a plant
but... it's an animal!

Image from: <http://www.alaska.net/~scabagen/images/sea cucumber.jpg>

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Common names vary



Chipmunk (English)
 Streifenhornchen (German)
 Tamia (Italian)
 Ardilla listada (Spanish)

Image from: http://www.entm.purdue.edu/wildlife/chipmunk_pictures.htm

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Common names can vary

Example:

mountain lion

puma

catamount

cougar



... are all names
for the same animal

By using a universally accepted scientific name
 scientists can be sure they are discussing
 the same organism

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Taxonomy: A useful tool

- Grouping organisms on the basis of their evolutionary relationships makes it easier to understand biological diversity.
- can be a useful tool for scientists who work in agriculture, forestry, and medicine.
- It often happens that the discovery of new sources of lumber, medicines, and energy results from the work of taxonomists.

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Dichotomous key

- A **Dichotomous** key- is made up of sets of numbered statements.

Each set deals with a single characteristic of an organism, such as leaf shape or arrangement.

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How Living Things Are Classified

- A group of organisms is called a **taxon**
- Organisms are ranked in taxa that range from having very broad characteristics to very specific ones.
- The broader a taxon, the more general its characteristics, and the more species it contains.

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THE DOMAINS OF LIFE

- Arranging life into kingdoms is a work in progress
- For several decades, biologists have classified life into five kingdoms

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THE DOMAINS OF LIFE

- A newer system recognizes two basically distinctive groups of prokaryotes
 - The domain **Bacteria** (Making a six kingdom system)
 - The domain **Archaea**
- A third domain, the **Eukarya**, includes all kingdoms of eukaryotes

Earliest organisms

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Kingdoms

- Based on the following criteria:
 - Presence or absence of a nuclear membrane
 - unicellular or multicellular
 - Type of nutrition
 - Autotrophic
 - Heterotrophic
 - Locomotion
 - motile
 - sessile[don't move]

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Monera or Bacteria and Archaea

more modern divided into **Bacteria & Archaea** (called extreme environments) (6 kingdoms)

- Prokaryotes
- Most primitive
- unicellular
- Asexual Binary Fission
- Many have a cell wall

- Some can move & some can't
- some are autotrophs, some are heterotroph

- Bacteria-CW composed of Peptidoglycan
 - can be gram stained ex. E. coli

Archaea - live in extreme env. [halophiles, thermophiles]
no peptidoglycan in C.Wall methanogen

Nov 29-9:02 AM

Protista



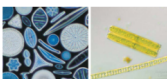
- Eukaryotic
- Moist environments
- Mostly unicellular
- Most diversity
- Most nutritionally diverse

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Protista

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Fungi

- Eukaryotes
- mostly Multicellular
- Asexual and sexual-spores
- Heterotrophic - absorption




Saprophytic nutrition
 -fungi release digestive enzymes outside of their body & absorb the digested nutrients back into their body.


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Fungi



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Plantae




- Eukaryotes
- Sexual/asexual

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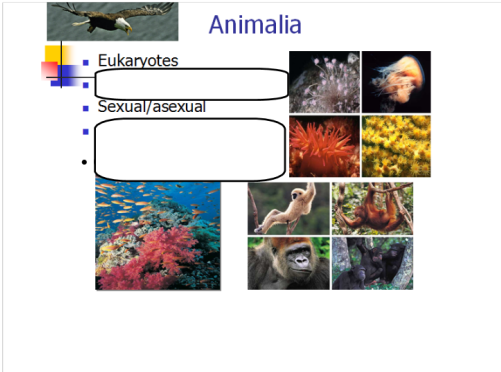
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Animalia

- Eukaryotes
- Sexual/asexual

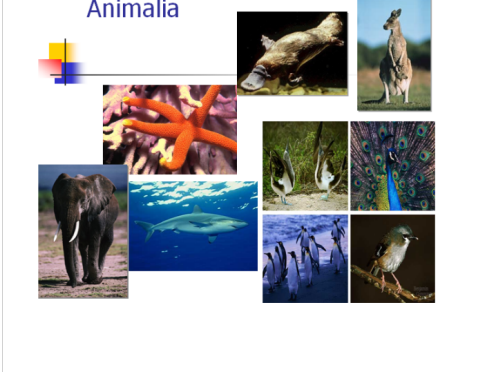


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Animalia



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Kingdom	Prokaryota		Eukarya			
	Bacteria	Archaea	Protista	Fungus	Plants	Animals
Cell Type	Prokaryote	Prokaryote	Eukaryote	Eukaryote	Eukaryote	Eukaryote
Body Type	Unicellular	Unicellular	Unicellular	Unicellular	Multi-cellular	Multi-cellular
Nutrition	Some are Auto & some are heterotroph	Some are Auto & some are heterotroph	Some are Auto & some are heterotroph	heterotroph Absorption	heterotroph	heterotroph
Motility	Some are motile some are sessile	Some are motile some are sessile	most are motile	Sessile	Sessile	motile
Examples	Streptococcus Bacillus lactis	Halophiles	Amoeba Paramecium	Yeast (single cell) mushroom	Sunflower Daisy	germy

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