

# Classification of Life

# Taxonomy:

Def: branch of biology that names and groups organisms according to characteristics and evolutionary history

# Systems of Classification

## Early systems

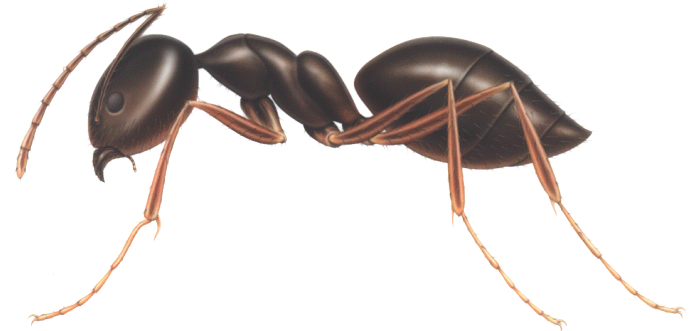
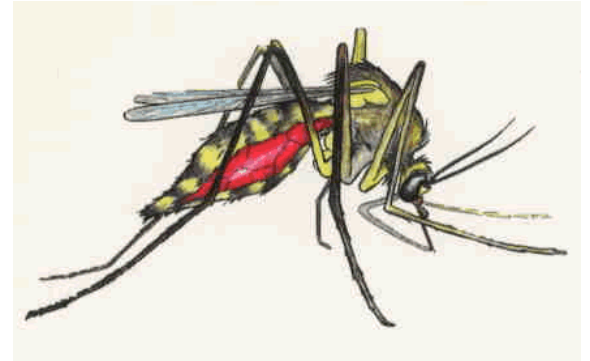
- Aristotle

ex: plants vs animals

-> land vs air vs water

\* bat/mosquito

\* mouse/ant



- Common names

- too confusing

- ex: bell pepper = green  
pepper



# Binomial Nomenclature (1700' s)

## 1) Linnaeus

a) focus on morphology  
(physical similarities)

















2) 2-part method of naming organisms

#1 = genus

(latin translation of common  
name)

#2 = species identifier

a.k.a. species epithet

(adjective, location, discoverer)

### 3) examples:

#### a) Homo sapien

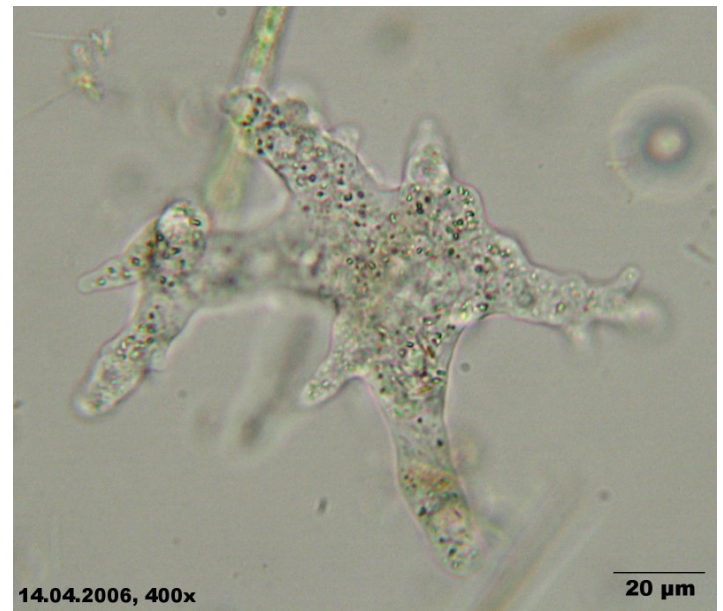


Homo= latin for human  
sapien = latin for wise

- \* Genus is capitalized
- \* italics or underlined

#### b) *Panthera leo*

#### c) *Chaos chaos*



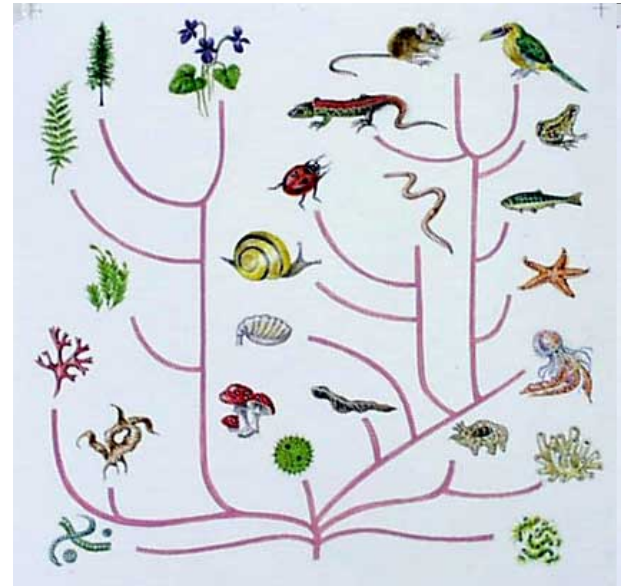
## 4) sub-species

- a) sometimes a 3<sup>rd</sup> name is used for variations of species that occur in different geographic areas



# Modern Techniques

## - Phylogeny



a) family tree showing evolutionary history

-see pg 282-283

b) based on anatomy (physical characteristics)

ex: insect & mammalian legs



ex: bones



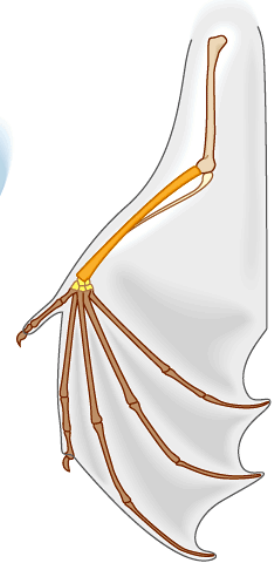
**Human**



**Cat**



**Whale**



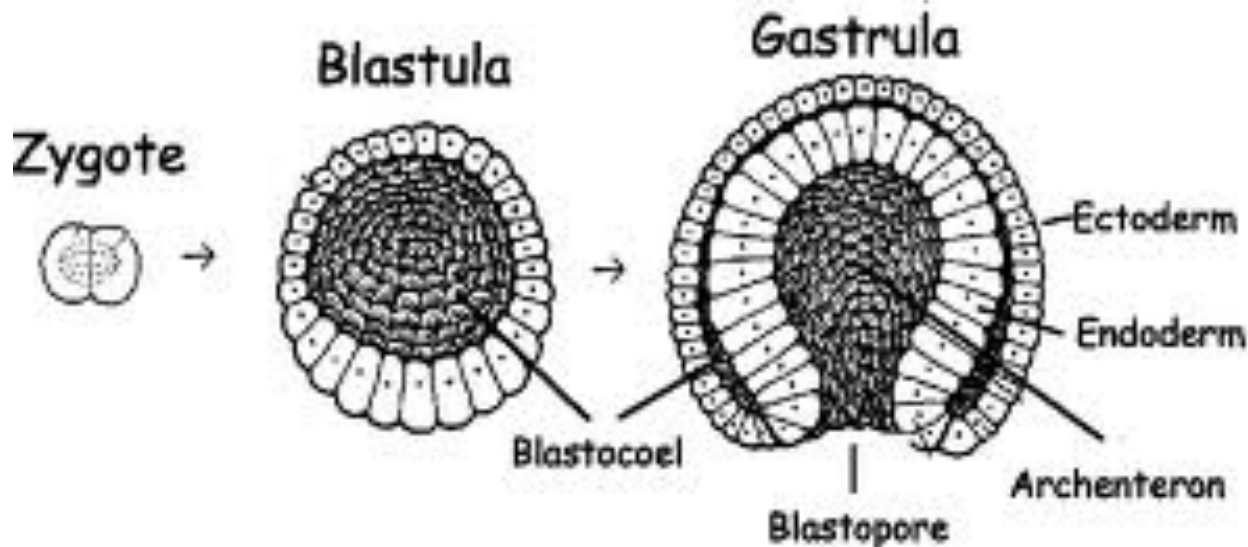
**Bat**

Copyright © Pearson Education, Inc., publishing as Benjamin Cummings.

# Embryonic development

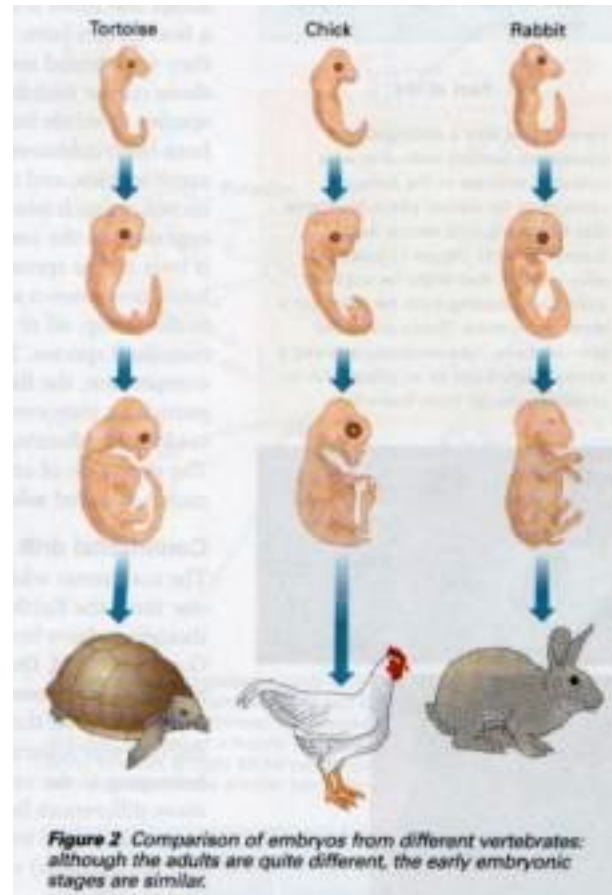
## a) blastopore

ex: echinoderms &  
vertebrates digestive  
system development more  
alike





## b) embryos of different species similar



# Chromosomes

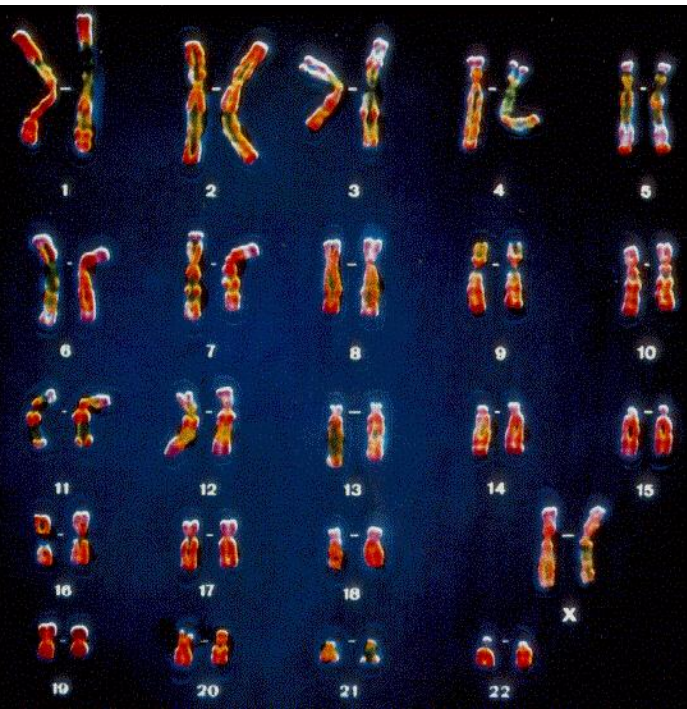
## a) DNA analysis

ex:

1. karyotypes (#)

2. similarities between  
regions

3. chimps & people...5mya



# Levels of classification

Kingdom

Phylum

Class

Order

Family

Genus

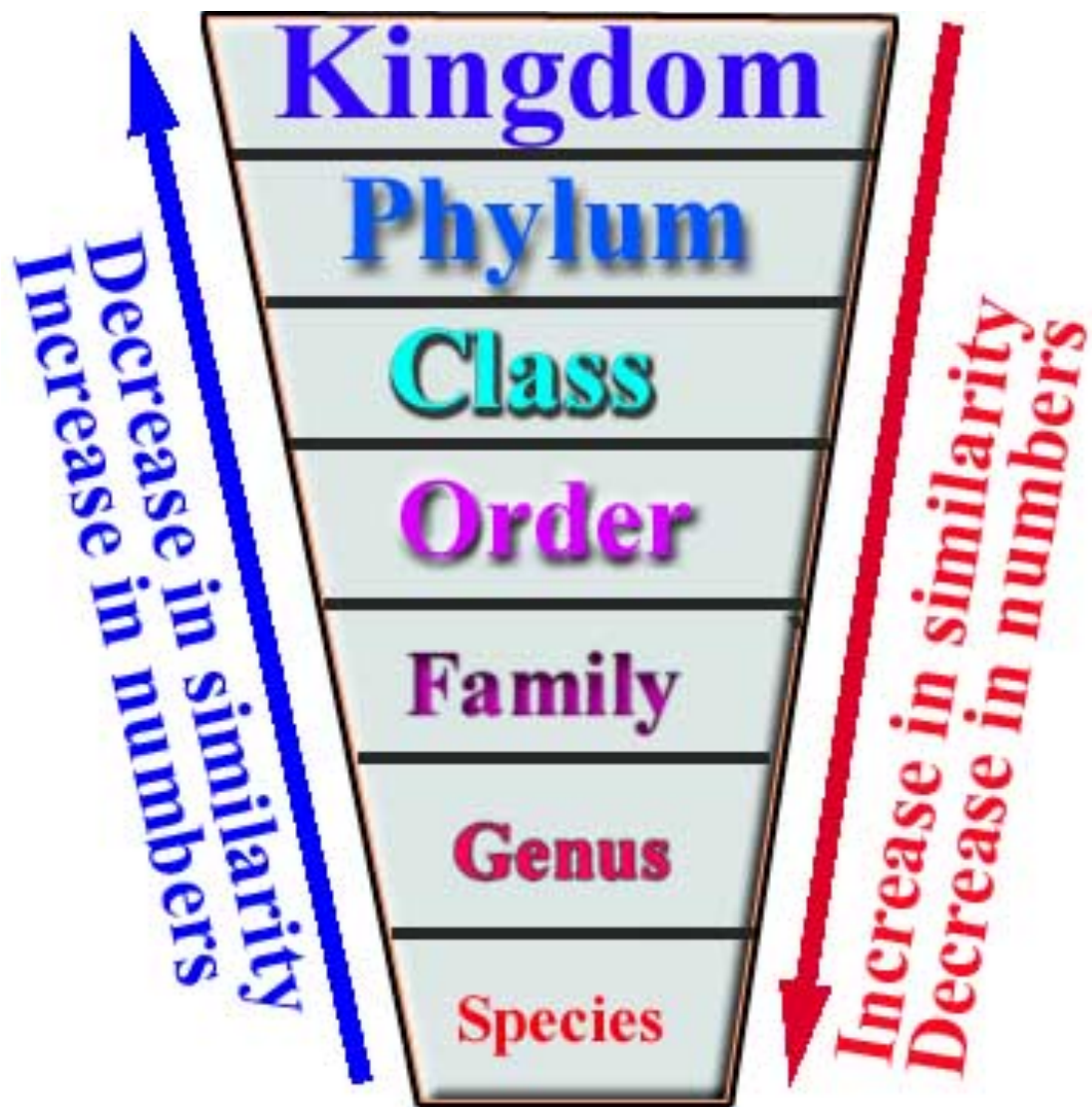
Species

general

specific









KINGDOM ANIMALIA

PHYLUM CHORDATA

CLASS MAMMALIA

ORDER CARNIVORA

FAMILY Felidae

Canidae

Ursidae

GENUS *Felis*

*Panthera*

*Canis*

*Ursus*



SPECIFIC EPITHET

*catus*

*pardalis*

*pardus*

*familiaris*

*lupus*

*arctos*

*horribilis*



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



**KINGDOM Animalia**

---



**PHYLUM Chordata**

---



**CLASS Mammalia**

---



**ORDER Carnivora**

---



**FAMILY Ursidae**

---



**GENUS Ursus**

---



**SPECIES *Ursus arctos***

# 3 Domains

## 1) bacteria

- prokaryotic cells

ex: no membrane bound  
nucleus

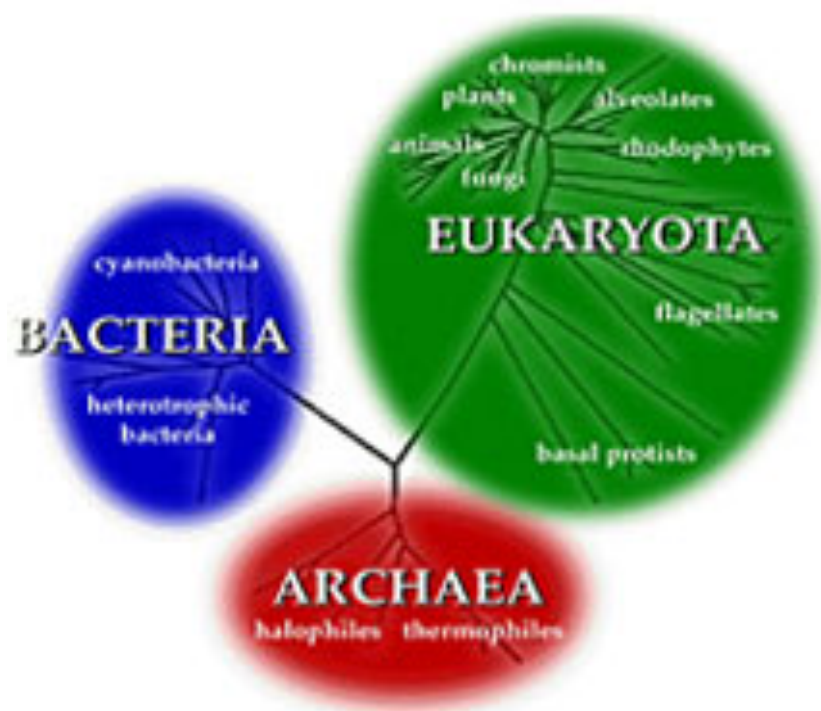
## 2) archaee

- prokaryotes

ex: no membrane bound  
nucleus

## 3) eukaryotes

- cells with nucleus





# 6 Kingdom system

## 1) Kingdoms:

Bacteria-

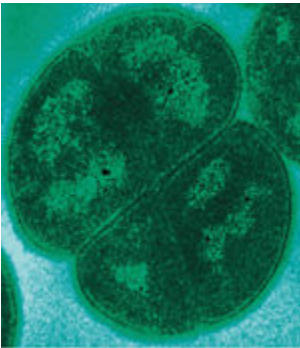
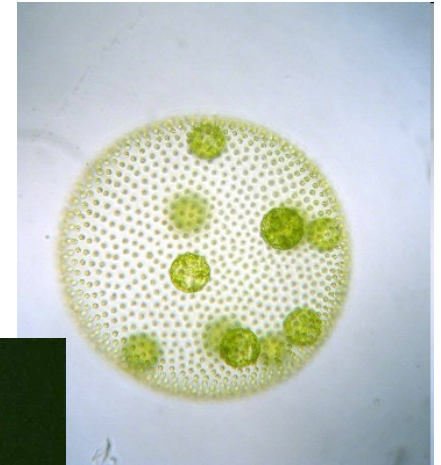
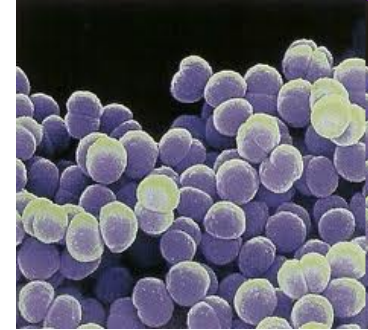
Archaea-

Protists-

Fungi-

Plants-

Animals-



2) based on cell type, # cells, cell wall material, nutrition, primary means of reproduction

Kingdom	Cell type	# Cells	Cell wall	Nutrition	Reproduction
Bacteria	prokaryote	unicellular	peptidoglycan	autotroph & heterotroph	asexual
Archaea	prokaryote	unicellular	no peptidoglycan; sometimes no cell wall	autotroph & heterotroph	asexual
Protista	eukaryote	unicellular & multicellular	cellulose; sometimes none	autotroph & heterotroph	asexual & sexual
Fungi	eukaryote	unicellular & multicellular	chitin	heterotroph	sexual
Plantae	eukaryote	multicellular	cellulose	autotroph & heterotroph	sexual
Animalia	eukaryote	multicellular	no cell wall	heterotroph	sexual