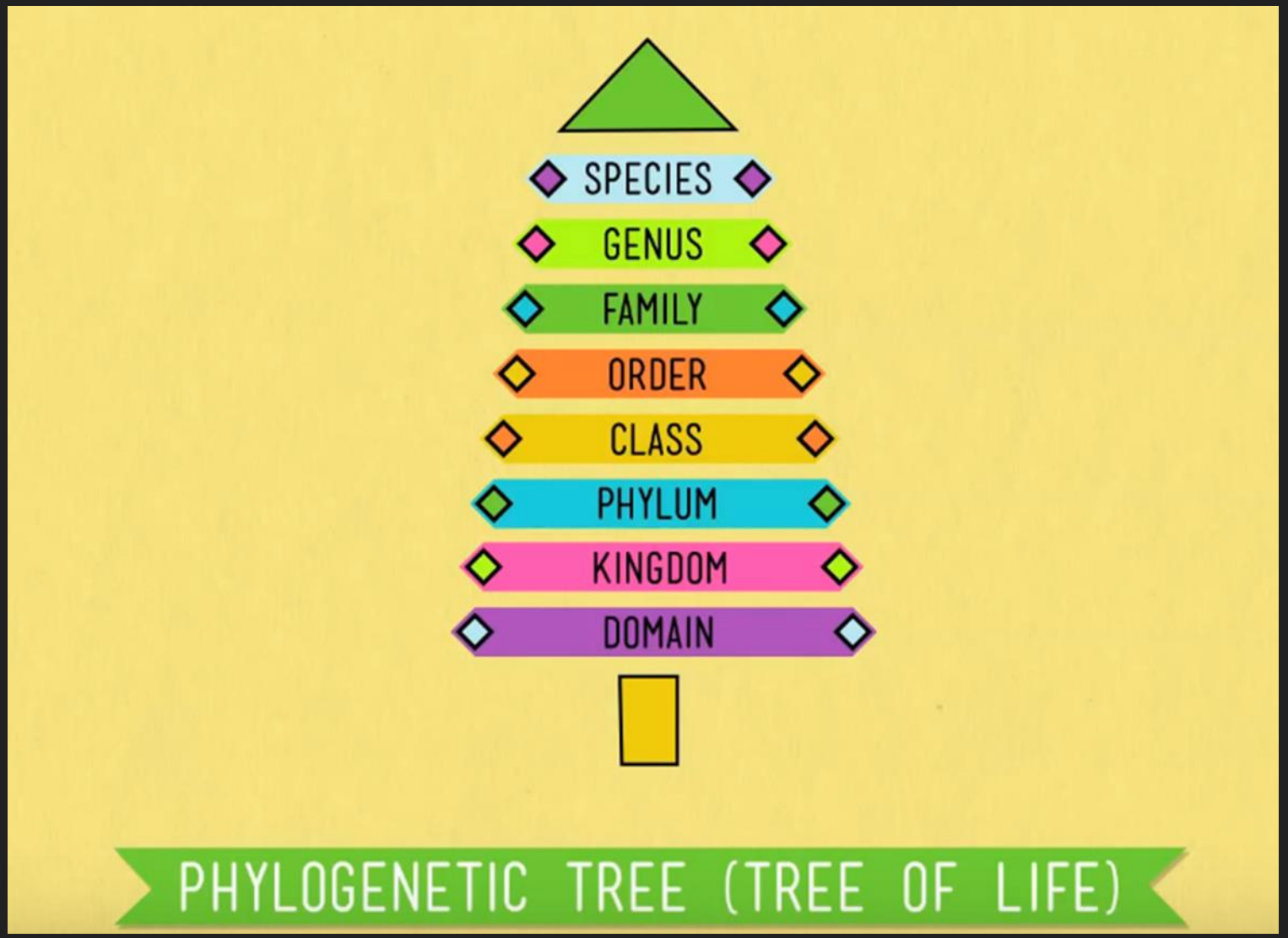
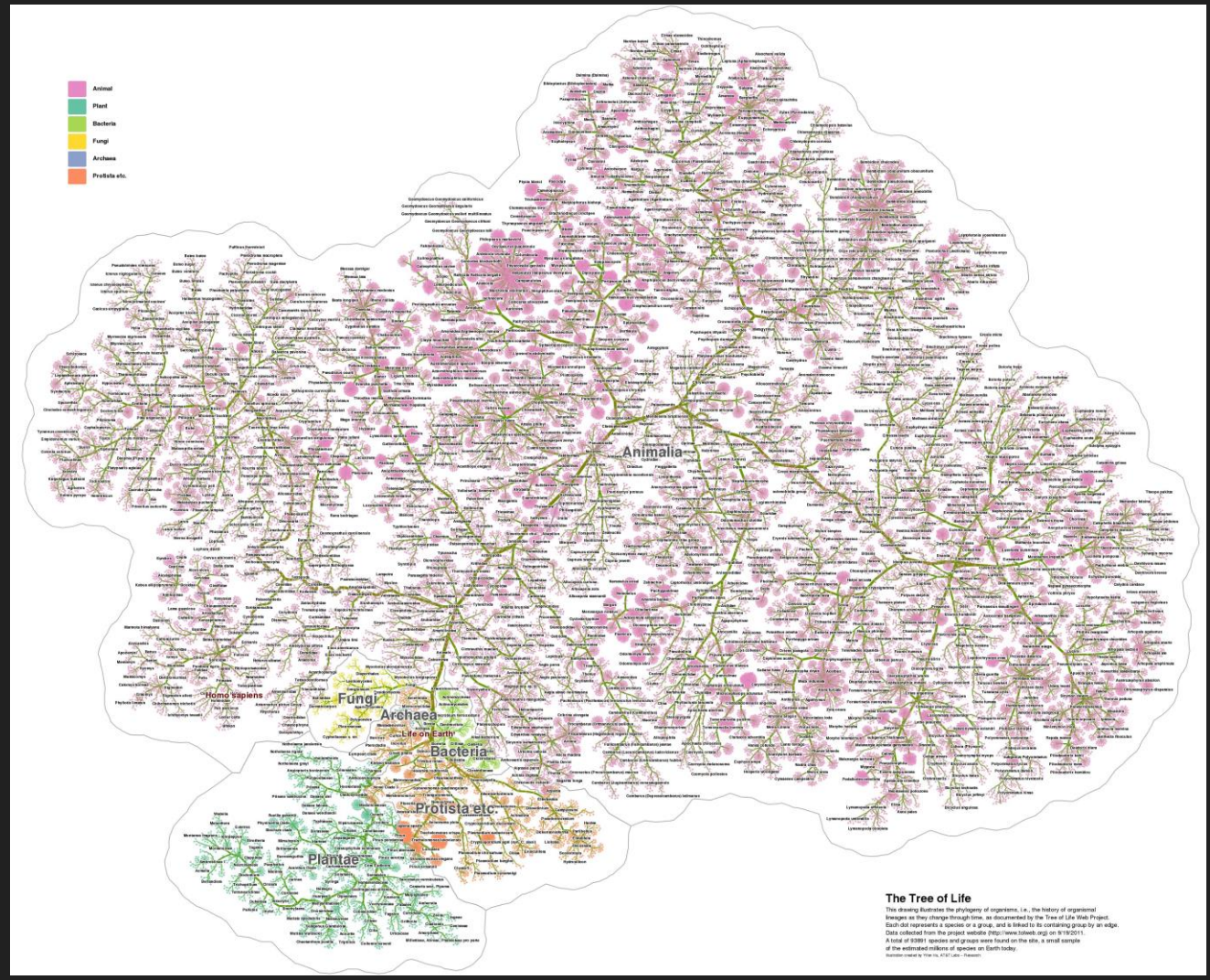
Taxonomy

Science of classifying living things



- Biologists have identified and named around 1.5 million species
- Estimated 2-100 million additional unknown species



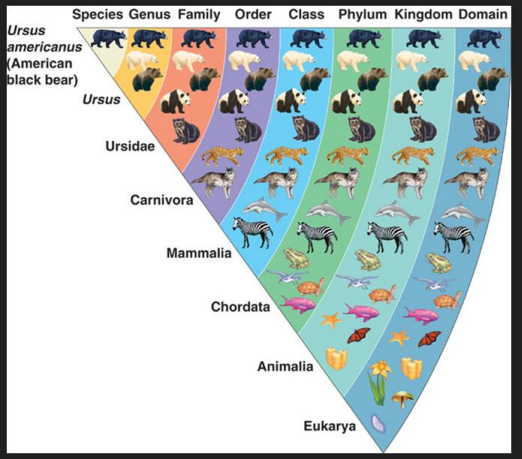
Why is Naming Important?

- Why would it be important that we have a standardized way of naming organisms?

Why Classify?

- Organisms need a name and organization
- By the 18th century, European scientists recognized that referring to organisms by their common name was confusing
- Common names vary among regions within a country
- By using a universal scientific name, you can be sure you are discussing the same organism
- In order to study the diversity of life, biologists need a classification system to name and group organisms in a logical manner

Taxonomy



- The Science of naming and assigning organisms into groups
- Groups of similar organisms are called taxa (taxon-singular)
- There are 7 taxa within taxonomy
  - 1.Kindgom
  - 2. Phylum
  - 3. Class
  - 4. Order
  - 5. Family
  - 6. Genus
  - 7. Species

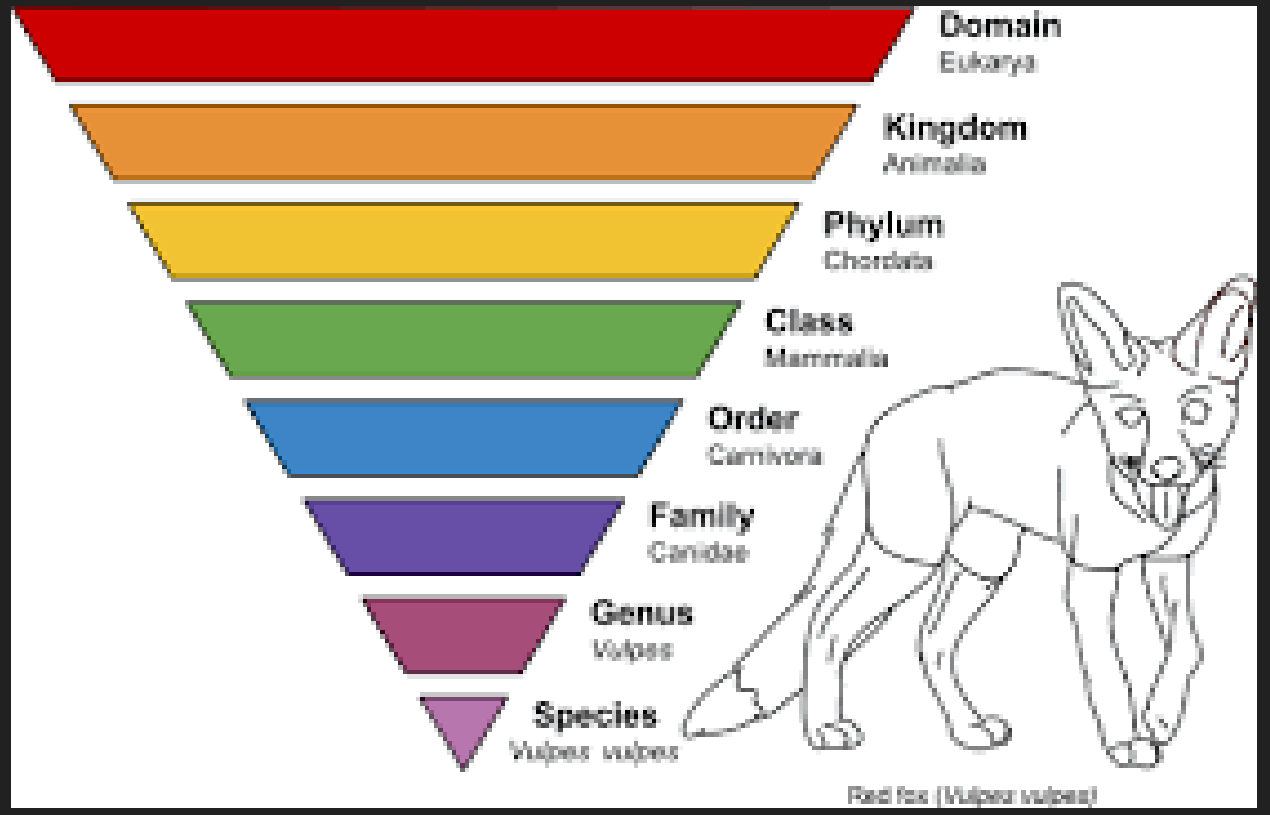
Very Large/General grouping

Very small/specific group of organisms

Come up with a mnemonic…

Mnemonic Device	
Kingdom	• King
Phylum	• Phillip
Class	• Came
Order	• Over
Family	• For
Genus	• Good
species	• Soup

Hierarchy



- Classification is hierarchal
- Starting from smallest to largest
  - Similar species are grouped into genera
  - Similar genera are grouped into families
  - Similar families are grouped into an order …..etc.

- Each level or taxon groups together organisms that share more characteristics than the level above

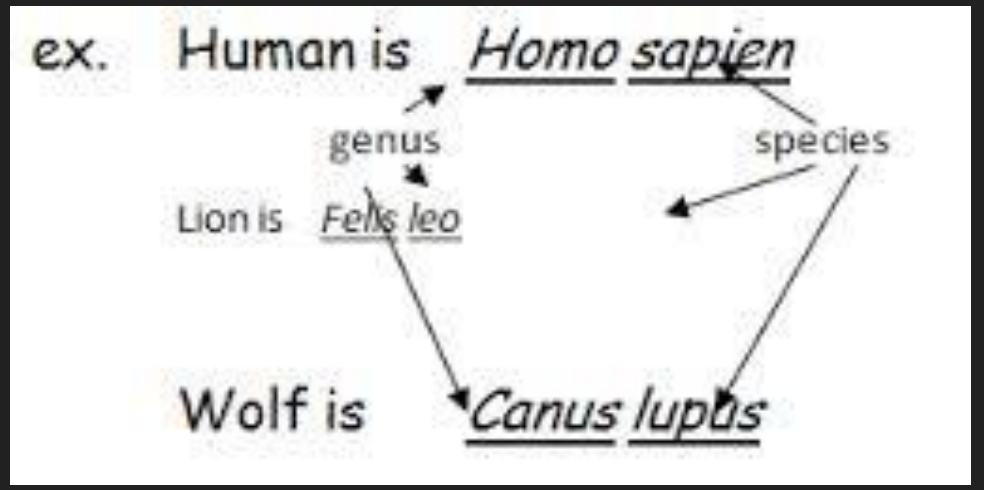
Assigning Names

- Discussed during the 18th century where Latin and Greek were well known
- First attempts of naming had scientists naming based on physical characteristics
  - Ended up with names 20 words long!

Ex.) The English translation of the scientific name of a particular tree might be “Oak with deeply divided leaves that have no hairs on their undersides and no teeth around their edges.”

Binomial Nomenclature

- Developed by Swedish Botanist Carl Linnaeus in the 18th century
  - Two part scientific name
  - Genus and Species
  - Always italicised
  - First letter of first word capitalized
  - Second name lowercase

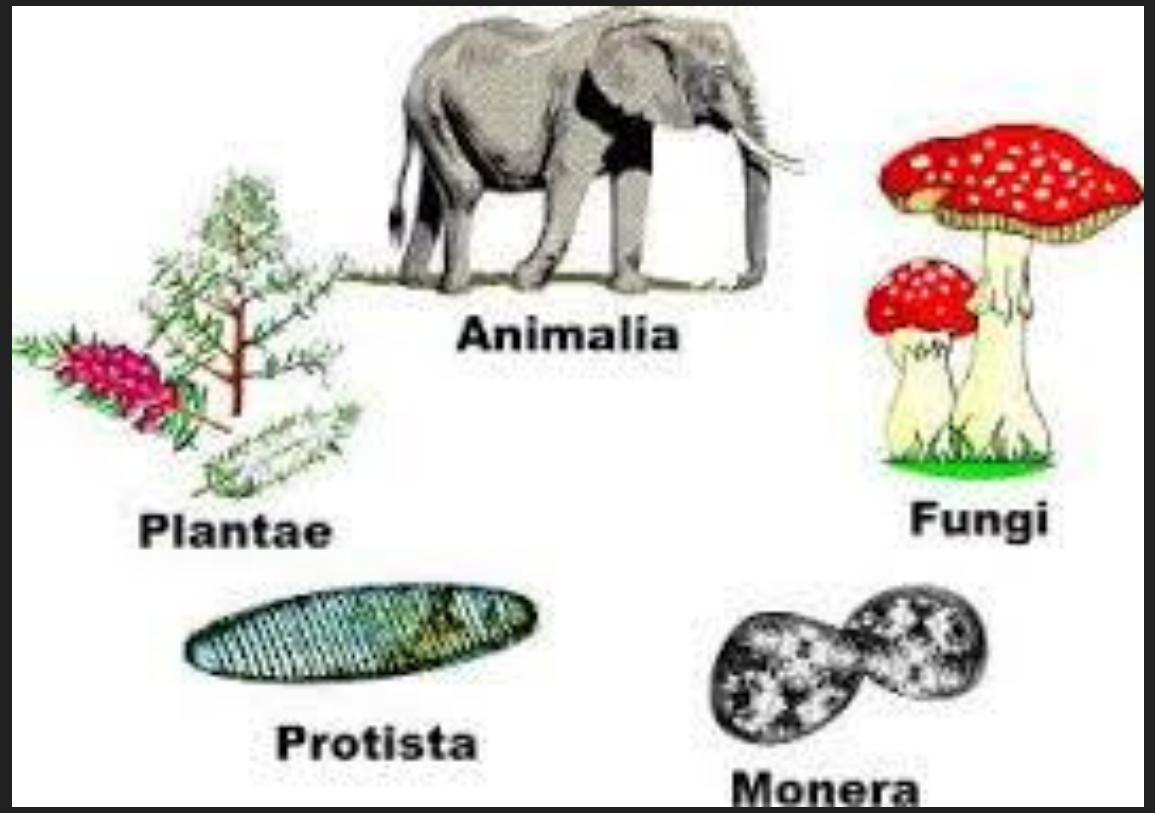


Examples of Classification

	HUMAN	OSTRICH
DOMAIN	Eukarya	Eukarya
KINGDOM	Animalia	Animalia
PHYLUM	Chordata	Chordata
CLASS	Mammalia	Aves
ORDER	Primate	Struthioniformes
FAMILY	Hominidae	Struthionidae
GENUS	*Homo*	*Struthio*
SPECIES	*sapien*	*camelus*

Traditional Taxonomy

- Linneaus- 2 Kingdoms
  - Animalia
  - Plantae
- A 5 kingdom system
  - Monera
  - Protista
  - Fungi
  - Plantae
  - Animalia

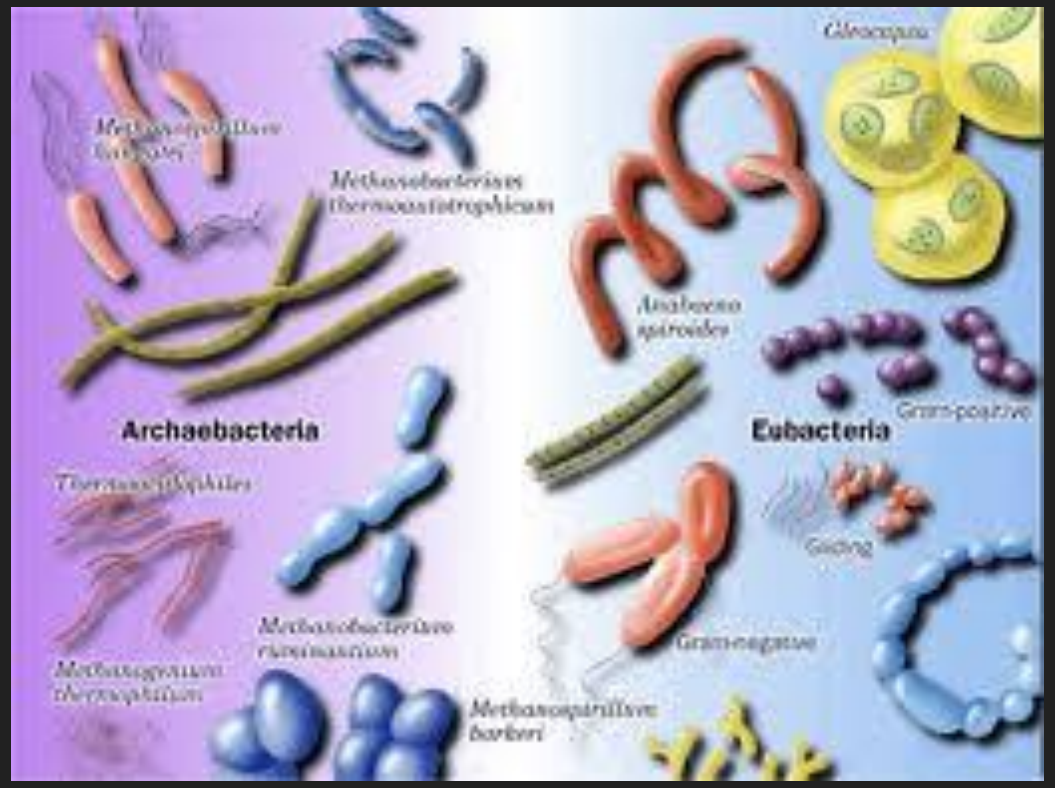


Time Out

- 18-1: Finding Order in Diversity

Recent Changes

- Was then split into a 6 Kingdom system
  - Due to large differences within Kingdom Monera, it was split into two different Taxa
    - Eubacteria
    - Archeabacteria

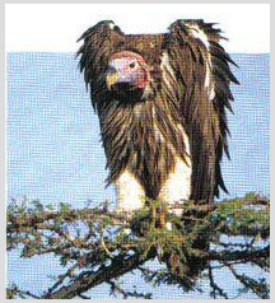


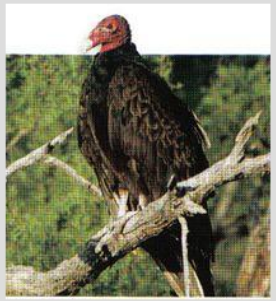
Changing Number of Kingdoms						
First Introduced	Names of Kingdoms					
1700s	Plantae					Animalia
Late 1800s	Protista			Plantae		Animalia
1950s	Monera		Protista	Fungi	Plantae	Animalia
1990s	Eubacteria	Archaebacteria	Protista	Fungi	Plantae	Animalia

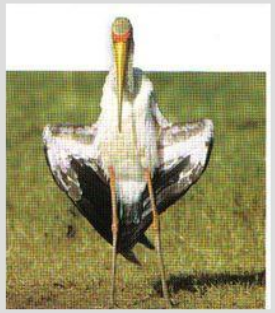
Molecular Analysis

- A lot of organisms have similarities on the molecular level
  - DNA/RNA
  - Indicates common ancestry
- These similarities are used to determine classification and evolutionary relationships
- Can also show how a species has changed
  - The more similar the DNA sequences of two species, the more recently they have shared a common ancestor.

Similarities in DNA can be used to help show evolutionary relationships and how species have changed.


African vulture


American vulture


Stork

Traditionally these first two were classified together in falcon family. Storks were put in a separate family.

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