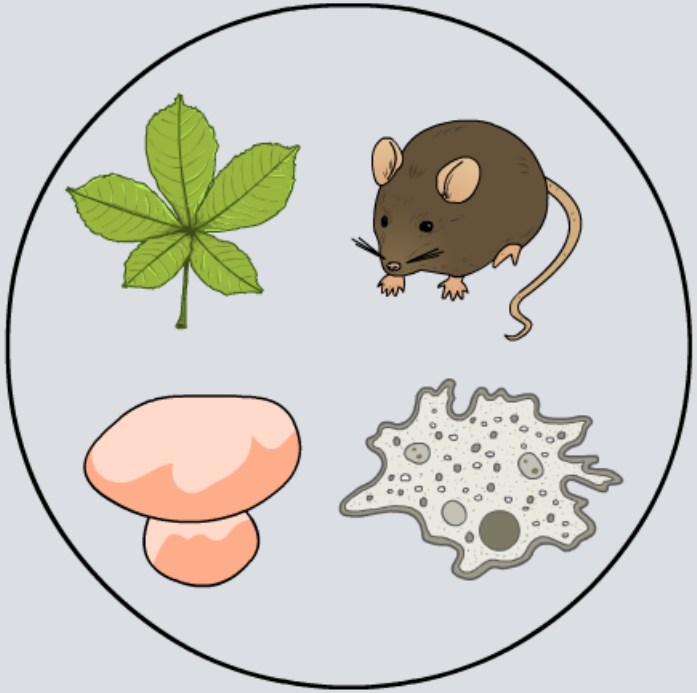
Classification

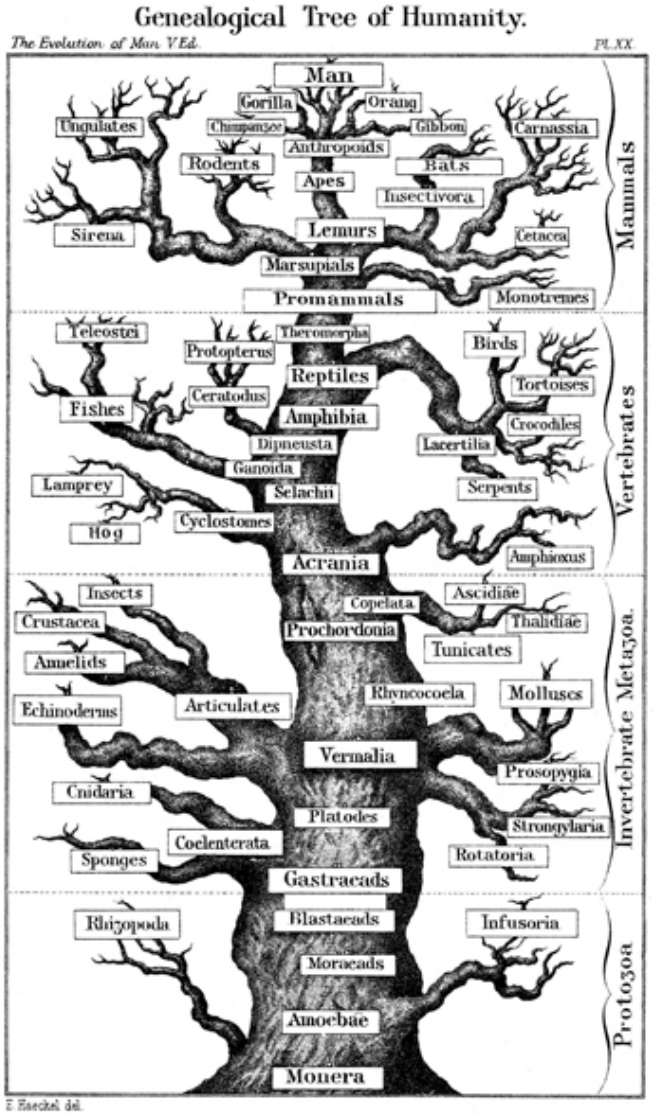


What is classification?

Classification is the arrangement of organisms into groups of various sizes on the basis of shared features.

Taxonomy is a form of classification that focuses on physical similarities between different species, for ease of naming and identification.

Phylogeny is the classification of organisms by these evolutionary relationships, so that every group shares a common ancestor.



Choosing taxa

Classify these animal species by their shared features









How might these animals be classified?

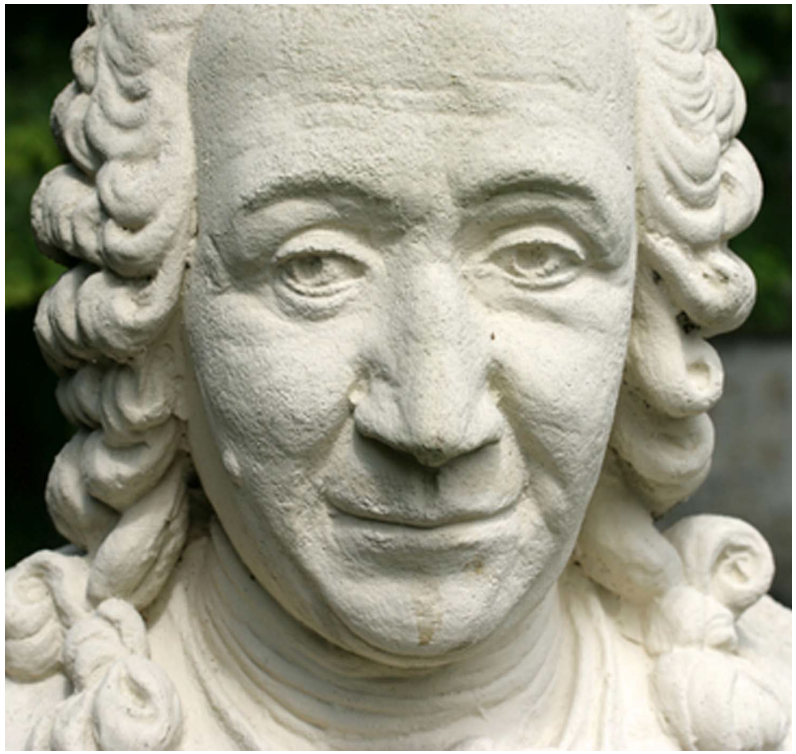
Click "**start**" to identify some of their distinguishing features.

start

Linnaean taxonomy

There are many different, and equally valid, ways of classifying organisms by shared features.

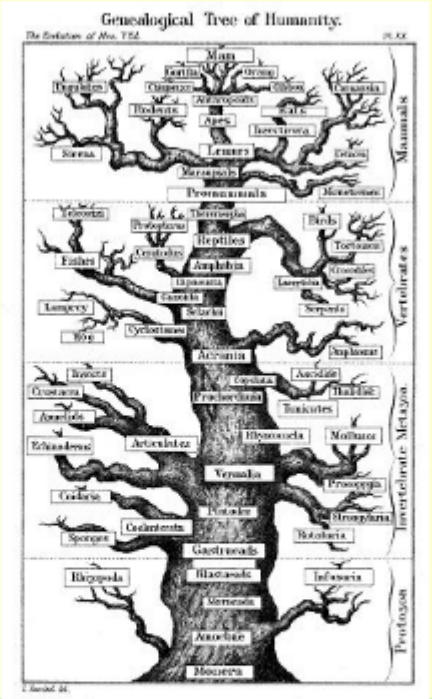
It is important to be able to choose key features and ignore others. For instance, many insects and birds are capable of winged flight, but the two groups are otherwise very different.



The first scientist to introduce a formal system of taxonomy was Carl Linnaeus. **Linnaean taxonomy** is still the basis of the systems we use today.

The evolution of classification

Click the dates in the timeline to find out more about how organisms have been classified through history.



1735 — 1866 — 1937 — 1956 — 1966 — 1977 — 1990

The taxonomic hierarchy

How are organisms classified in modern taxonomy?

There are many levels of classification, from subspecies to superphylum. The following eight levels are widely accepted as a modern standard.

Click on a button for more information.

- domain
- kingdom
- phylum
- class
- order
- family
- genus
- species

Kingdom Plantae

The main characteristic feature of individuals in the **plant** kingdom is their ability to manufacture their own sugars from simple molecules by photosynthesis. They are **autotrophs**.

Their other main defining feature is the **cellulose cell wall** found in every cell.

There are an estimated 350,000 species of plants, which include trees, herbs, bushes, grasses, vines, ferns and mosses.

Kingdom Animalia

Members of the **animal** kingdom are multicellular **heterotrophs** – they are dependent on other organisms for food.

All animals, except sponges, have nervous and muscular systems, enabling them to react quickly to environmental stimuli. This means most animals are **motile** – they can move spontaneously and voluntarily.

The animal kingdom contains most multi-cellular organisms and is the most diverse of all the kingdoms.

Kingdom Fungi

Fungi are eukaryotic **heterotrophic** organisms that have a chitin cell wall. Some grow as single cells, but most are multicellular.

Reproduction usually occurs via **spores**, often produced by specialized fruiting bodies. This is the sexual phase of a fungal life cycle and is the most visible – mushrooms, for example, are fruiting bodies.

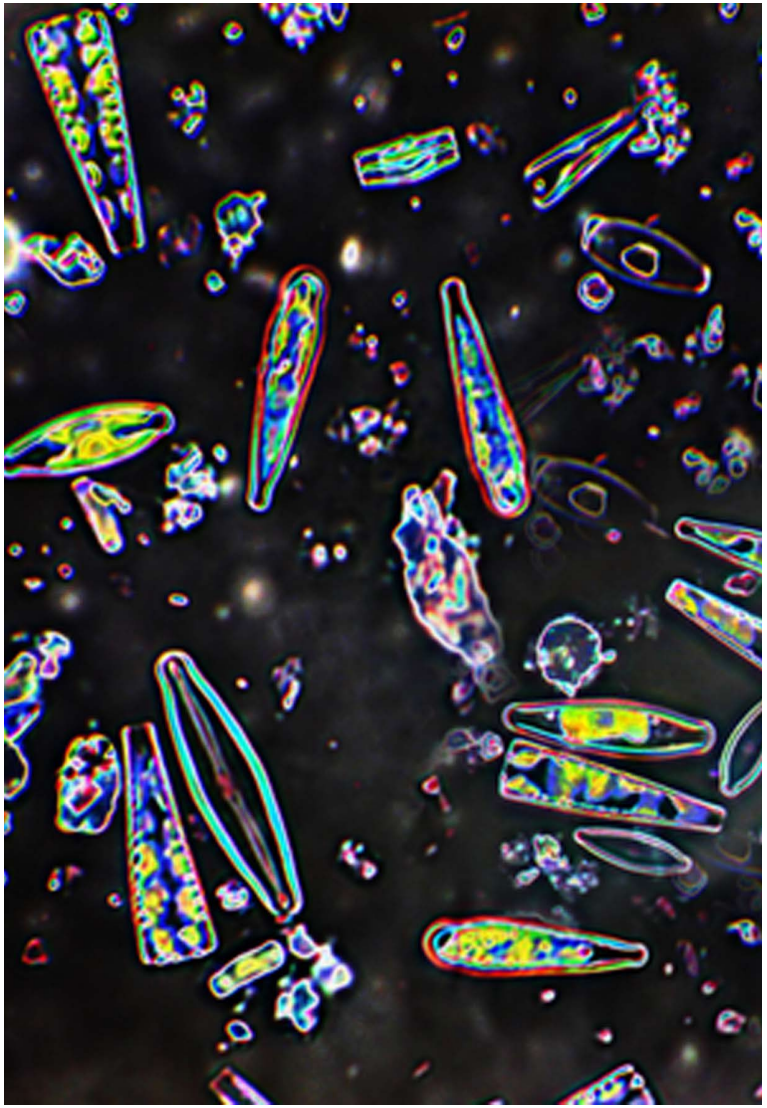
The vegetative part of a fungus, called the **mycelium**, consists of a mass of thread-like structures. It often extends underground and can reach a massive size.

Kingdom Protista

Protists are a group of eukaryotic organisms that do not fit into other kingdoms.

As such, they do not have much in common, apart from having relatively simple organizations. They are unicellular, or multicellular but with unspecialized cells.

Some groups resemble other kingdoms. The **protophyta** resemble plants, and **protozoa** resemble animals.



Kingdom Monera

Monera are bacteria and other unicellular organisms whose genetic material is loose in the cell. They form one kingdom in the five-kingdom system and were previously called **Prokarya**.

Monera have been subdivided into the domains **Eubacteria** and **Archaebacteria** based upon molecular **phylogenetics**, as well as into kingdoms in the six-kingdom system.

Archaebacteria were initially thought to only live in extreme environments (e.g. hot sulfur springs) but have now been discovered in all major habitats.

Taxonomic rankings

Arrange these groups in order from largest to smallest

phylum

order

class

kingdom

genus

species

domain

family