

CLASSIFICATION



ORGANIZATION OF LIVING THINGS

S7L1



- Students will investigate the diversity of living organisms and how they can be compared scientifically.

Classification

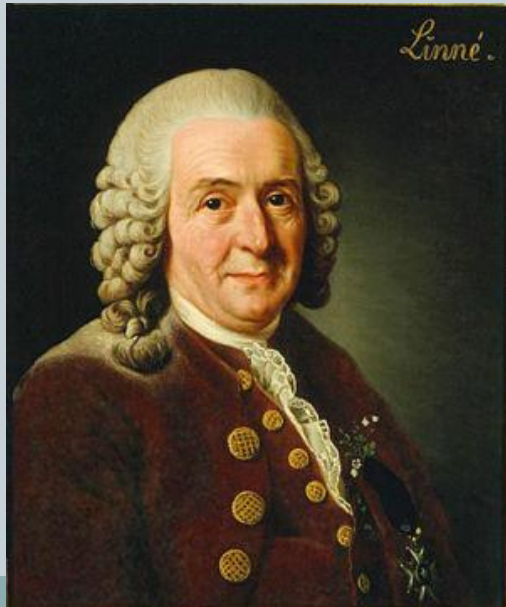


- Putting things into orderly groups based on similar characteristics.
- Why do scientists classify?
 - Biologists classify living organisms to answer questions such as:
 - How many known species are there?
 - What are the defining characteristics of each species?
 - What are the relationships between these species?

How do scientists classify?



- Taxonomy: the science of describing, classifying, and naming living organisms.
- Carolus Linnaeus developed a system of classification that scientists still use today!



His classification system is now
known as
“Binomial Nomenclature”

How do scientists classify?



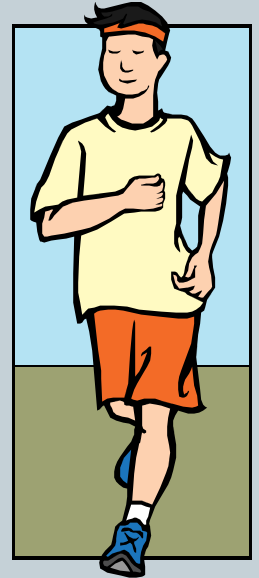
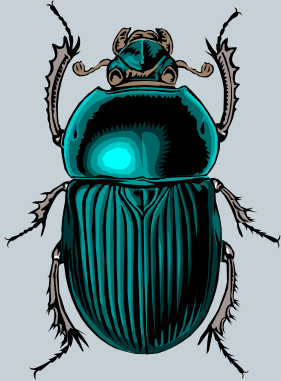
- There are seven levels of classification:
 - Kingdom
 - Phylum
 - Class
 - Order
 - Family
 - Genus
 - Species

**A species is a group of organisms that are closely related and can mate to produce fertile offspring **

How do scientists classify?



- Kingdom Animalia

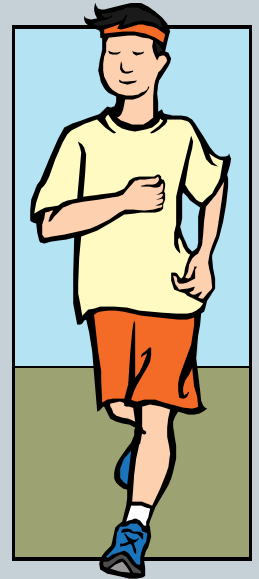


All animals are in the kingdom animalia

How do scientists classify?



Phylum Chordata

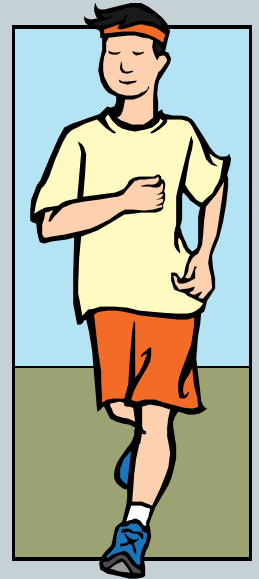


All animals in the **phylum chordata** have a hollow nerve cord.
Most have a backbone.

How do scientists classify?



- Class Mammalia



Animals in the **class Mammalia** have a backbone.
They also nurse their young.

How do scientists classify?



- Order Carnivora

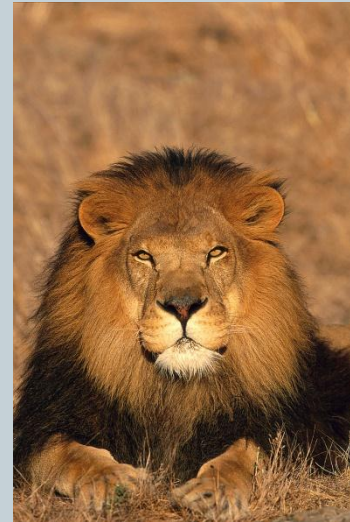


Animals in the **order Carnivora** have a backbone and nurse their young. They also have special teeth for tearing meat.

How do scientists classify?



- Family Felidae



Animals in the **family Felidae** are cats. They have a backbone, they nurse their young, have special teeth for tearing meat, and have retractable claws.

How do scientists classify?



- Genus *Felis*



Animals in the **genus *Felis*** have a backbone, nurse their young, have special teeth for tearing meat, and have retractable claws. However, these cats cannot roar; they only purr.

How do scientists classify?



- Species *domesticus*



The **species *Felis domesticus*** is the common house cat. The house cat shares traits with all of the organisms in the levels above the species level, but it also has unique traits.

How do scientists classify?



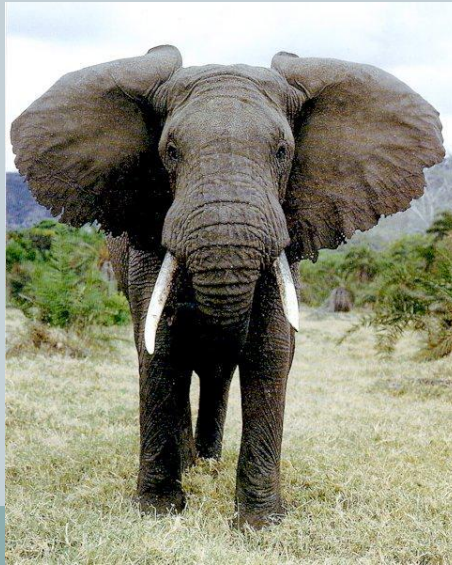
- Scientists give living organisms a scientific name.
- Linnaeus developed a system that gave each species a two-part name.
 - This is called “binomial nomenclature”
- The first part of a scientific name is the organism’s *Genus*
- The second part of a scientific name is the organism’s *species*

How do scientists classify?



- The scientific name of an elephant is *Elephas maximus*.
- What is the genus to which an elephant belongs?
- What is the species to which an elephant belongs?

Always write a
scientific name in
italics



Capitalize the
Genus name,
but keep the *species*
name lowercase

How do scientists classify?



- All living organisms are placed into one of the **SIX KINGDOMS**:
 1. Kingdom Archaeobacteria
 2. Kingdom Eubacteria
 3. Kingdom Protista
 4. Kingdom Fungi
 5. Kingdom Plantae
 6. Kingdom Animalia

Terms to know:



- Prokaryote: organisms whose cells do not have a nucleus.
- Eukaryote: organisms whose cells have a nucleus and membrane-bound organelles.
- Autotrophs: organisms who produce their own food.
- Heterotrophs: organisms who are unable to produce their own food.

Kingdom Archaeobacteria



- All organisms in the kingdom Archaeobacteria are *prokaryotes*.
- Most archaeobacteria live in extreme environments, where other organisms could not survive.



A hot spring found in Yellowstone National Park (194°C). The yellow and orange rings around the edge of the hot spring are made up of billions of archaeobacteria.

Kingdom Archaeobacteria



- Some archaeobacteria are heterotrophs, but some are autotrophs.
- Most archaeobacteria are **unable** to move, but a few can move.
- Archaeobacteria are the oldest known life forms.
- Why are archaeobacteria not classified with “modern bacteria”?
 - Archaeobacteria and eubacteria are chemically different!



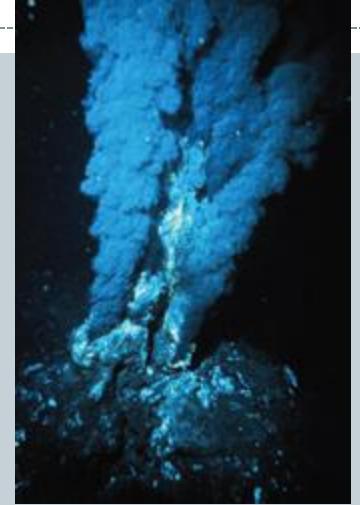
Kingdom Archaeobacteria



- Cool archaeobacteria info:
- Three divisions of archaeobacteria:
Methanogens: methane producing organisms

Thermophiles: These can live in extremely hot, acidic environments like sulfur springs.

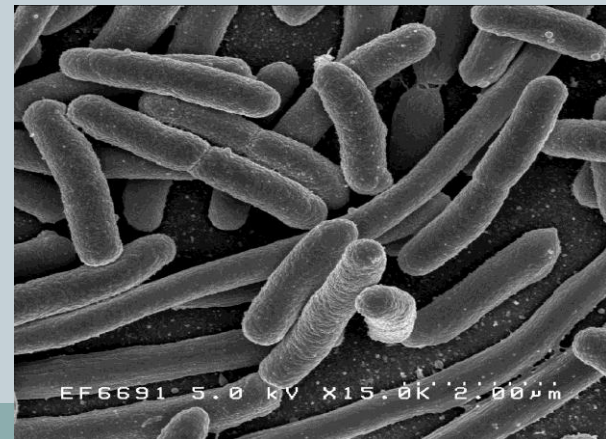
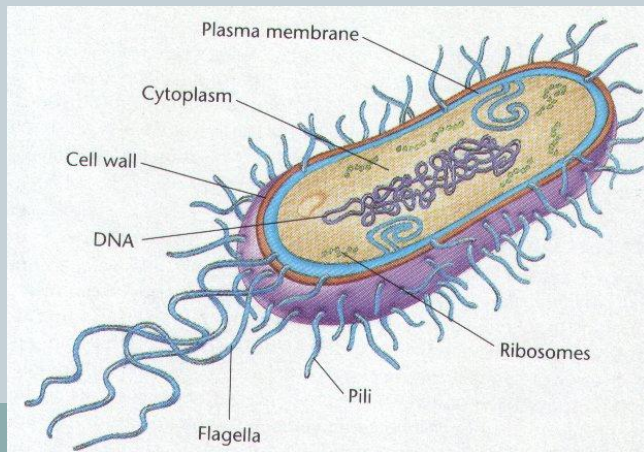
Halophiles: Can only live in bodies of concentrated salt water, like the Dead Sea.



Kingdom Eubacteria



- Traditional prokaryotic bacteria
- Unicellular.
- Some are autotrophic, some are heterotrophic.
- Found in soil, water, human body, etc.
- *Esterichia coli* (*E. coli*) is found in large numbers in human intestines, where it produces vitamin K.



Kingdom Eubacteria



- Unlike archaebacteria, eubacteria require oxygen.
- Some bacteria contain cilia or flagella which allows them to move.

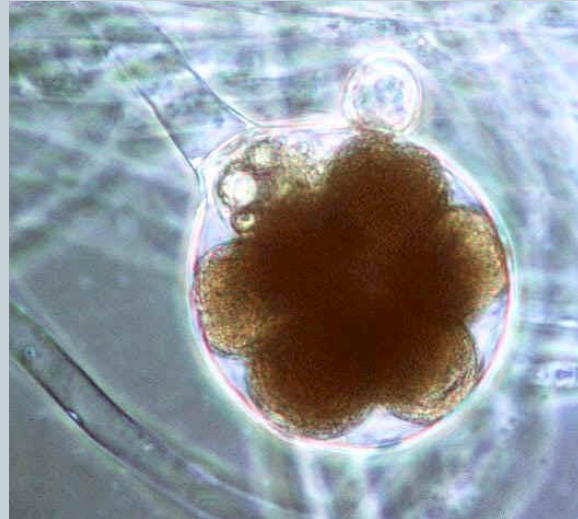


Kingdom Protista



- Eukaryotic organisms.
 - This is why they are not considered *bacteria*!
- Most protists are single-celled but some are simple, multicellular organisms
- “Junk Drawer Kingdom” or “Odds and Ends Kingdom”
- Some protists are autotrophic, some protists are heterotrophic.
 - Animal-like protists, plant-like protists

Kingdom Protista



Kingdom Fungi



- Fungi are eukaryotic organisms.
- Most are multicellular, only one type of fungi is unicellular (yeast).
- Fungi are heterotrophic.
 - Decomposers
 - Do NOT photosynthesize!
- Fungi are not able to move.
- Reproduce by spores.
- Molds and mushrooms are examples of fungi.



Kingdom Fungi



- Molds and mushrooms are examples of fungi.
- Fungal cell walls contain chitin.
 - (cell walls of plants contain cellulose).
- The study of fungi is known as *mycology*.
- Fungi are more closely related to animals than to plants!
- Usually, the only fungi that we see are reproductive structures. Tasty!!



Kingdom Plantae



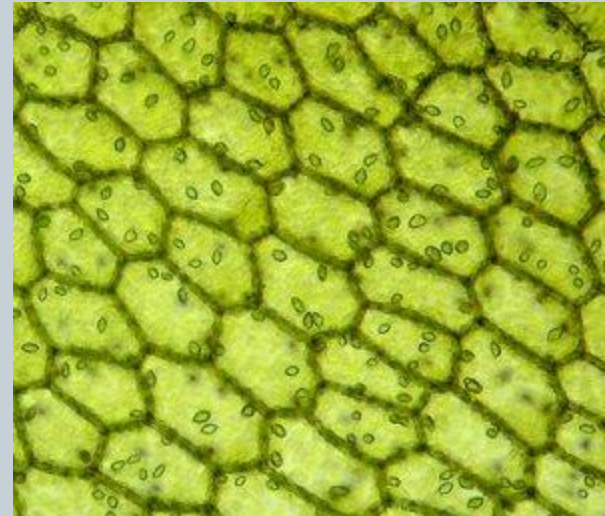
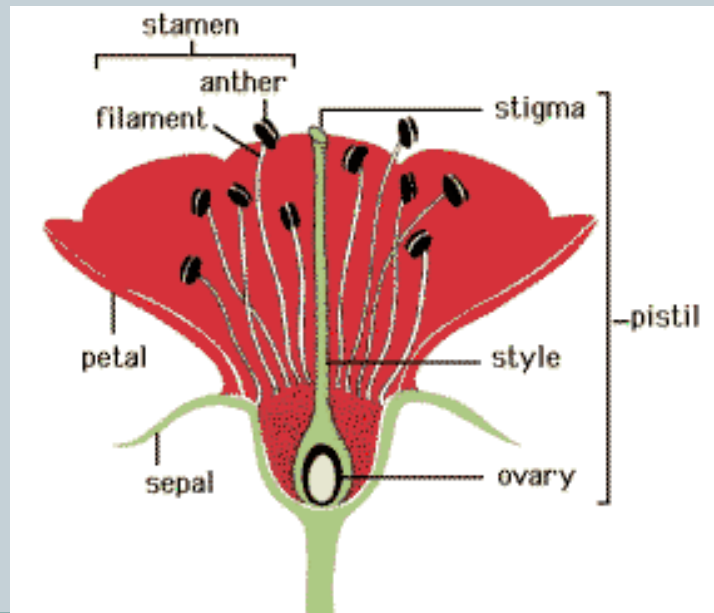
- Plants are eukaryotic, multicellular organisms.
- They are autotrophs- they make their food through photosynthesis.
- Plants can be found on land and in shallow water (where there is light)



Kingdom Plantae



- Plant cells have cell walls
 - Made up of cellulose, to provide them with a rigid structure
- Some plants reproduce through both asexual and sexual reproduction.



Kingdom Animalia



- This kingdom contains many complex, multicellular organisms.
- All animals are heterotrophic.
- All animals are able to move, even if it is only during some stages of the life cycle.



Kingdom animalia



- All animals are eukaryotic organisms, but animal cells do **not** have a cell wall.
- Most animals reproduce through sexual reproduction, but some are able to reproduce asexually (or both!).
- The most simple organism in the kingdom animalia is a sponge.

