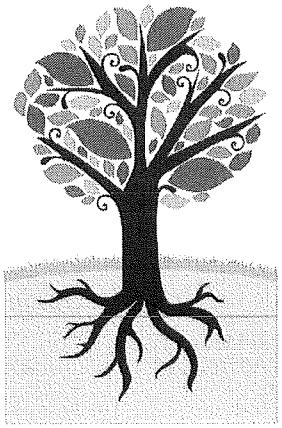
Ms. Smith Biosphere & Taxonomy Name: SMITH



Think w partner / aloud.

Is the life of a tree as simple as it appears?

- What hardships may it experience?
- What if there is a shortage of sunlight?
- Or a shortage of nutrients in the ground?
- What if the deer start eating its leaves?
- Insects eating holes through its bark and into the wood?
- Think about how trees relate to other organisms?

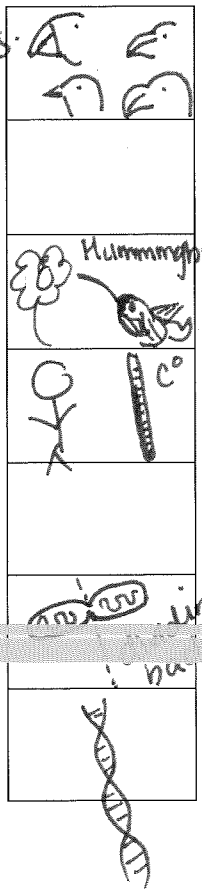
~~Extend off what Text says.~~

★ You may have answers to some of these questions

Branches of Biology

- BIO = Life OLOGY = the study of → BIOLOGY = the study of life
- Biologists may be **Botanists (** plants **)**, **Microbiologists (** cell biology **)**, **Zoologists (** animals **)**, or **Ecologists (** ecosystems **)** and many other types.

Themes associated with Life ★ NOT TO MEMORIZE TO UNDERSTAND.



galapagos finches.

- Evolution: Living organisms today are modified descendents of common ancestors.
- Emergent Properties: each level of organisation has new EP the one before didn't have. A hierarchy structure building one on another.
- Interaction with environment: everything interacts w environment including organisms & nonliving factors.
- Homeostasis: Biological processes self-regulate
- Correlation between structure/function: what things are similar between structure / function. ie Hollow bones ; flight.
- Continuity of life: "Heritable Information"
  - all cells have DNA
  - The heritable material directs cell activities
  - passing info from parents to offspring.
  - sexual + asexual reproduction

performing all life's activities . Ability to reproduce, divide, grow and repair.

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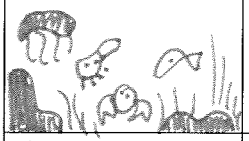
Levels of Organization

Something is alive b/c it does what living things do.

- **Life** is defined by what living organisms do. Life is also studied at different levels. Biology can be studied from any level in the table below.
- Using these levels helps us make sense of the enormous topic of biology.
- **For example**, consider a multi-cellular organism with systems like a digestive system. This system has organs made from tissues that are made from even smaller parts. Going larger, that organism lives in an area like a pond, or a forest where all the plants, animals and other organisms living there influence the entire environment.

_____ above organism

~~~~ below organism "within"

Ecosystem →	Community →	Population →	Organism →
community + nonliving surroundings 	Populations live together in defined area 	Group of organisms of 1 type in same area 	Individual living thing 

Organ system →	Organ →	Tissue →	Cellular →	Molecules →
organs working together toward common activity	organ performs 1 or more function	ie. Muscular or nervous	functional unit of life.	Atoms form molecules (H_2O)
Digestive + Circulatory	heart	Cardiac tissue	Heart or cardiac cells.	cells carry oxygen + CO_2.

☆ NOT TO MEMORIZE BUT TO UNDERSTAND AS A PROCESS

☆ HELPFUL TO READ ALOUD.
~~~~

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You're at the grocery store and need to pick up some pizza crusts....
Safeway - deli but superstore - bakery.
why? reasoning?

How do we organize animals or in general living things?

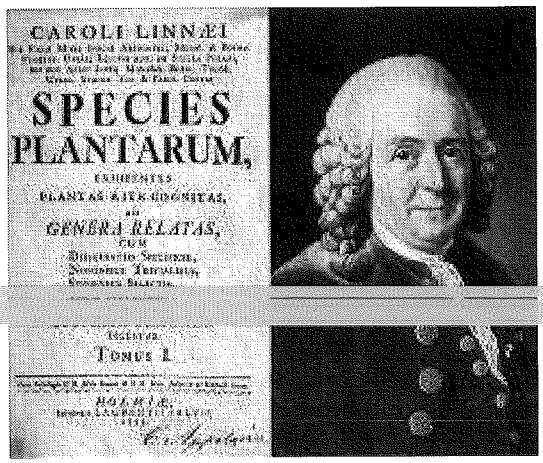
- Grouping and arranging objects together is something we do naturally, and it is something we do for classifying organisms.

- Indigenous peoples all around the world did not need complicated classification systems.
- Some plants were food, some were medicine, others for shelter, or for weapons etc.
- Animals were grouped based on how they moved; swim, fly, run. etc.

Taxonomy

Taxonomy is a branch of biology that is concerned with the ordered division and naming of organisms.

It also enables scientists to design and rearrange the groupings as the knowledge of organisms increases. Systems that are modifiable are not likely to disappear.



CARL LINNAEUS – used and promoted binomial nomenclature system
Known as the "Father of modern taxonomy" and his system is still in use today.
widely used today in parts.

- Species organized into specific groups
- according to similarities and characteristics
- groups called TAXA / TAXON.

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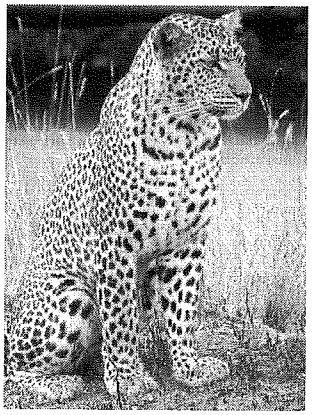
HOW TO SCIENTIFICALLY NAME ORGANISMS



1. Each species has a 2 part name
2. 1st part → Genus (must capitalize first letter)
3. 2nd part → specific name (all lower case)
4. Entire name is *italicized*

EXAMPLE: *Panthera pardus*

Panthera pardus students can underline

**most often you will write by hand, so underline instead of italicizing.

**scientific names are built with last names first. There are many types of maple trees, so we identify that it is *Acer* and then identify what type of maple it is…*Acer glabrum* (Maple Douglas).

/ maple / douglas.

The Taxonomic System

S species **G** genus **F** family **O** order **C** class **P** phylum **K** kingdom **D** domain

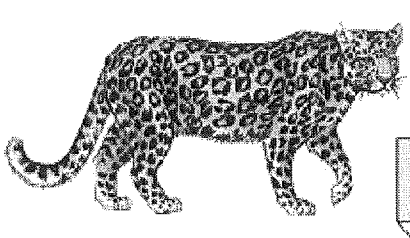
species genus family order class phylum kingdom domain

most Specific ← → most General

← leads to identifying a specific species
→ tells you how it is organized – the larger group it is from.

- Linnaeus introduced a system for grouping species. It is an 8-step approach
- Each step or **taxon** represented a clustering of organisms.

Hierarchical classification



Carolus Linnaeus
Binomial nomenclature

the system for naming.

Examples using Domain Eukarya

HUMAN: Animalia, Chordata, Mammalia, Primates, Hominidae, *Homo sapiens*

CAT: Animalia, Chordata, Mammalia, Carnivora, Felidae, *Felis catus*

WOLF: Animalia, Chordata, Mammalia, Carnivora, Canidae, *Canius lupus*

TRY THIS:

species: extinct sabre-toothed cat fatalis

genus: ~~fatalis~~ smiloden

WRITE IT OUT → Fatalis smiloden Fatalis smiloden

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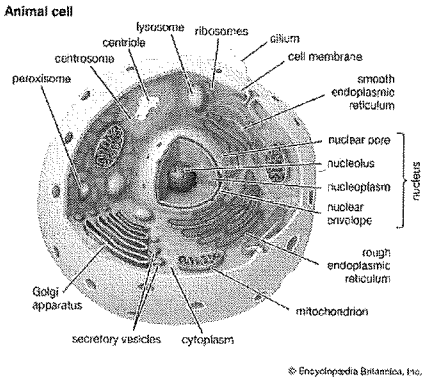
New and Old

- Early taxonomists classified all species as plants and animals
- 5 kingdoms were eventually made: Monera, Protista, Plantae, Fungi, and Animalia
- Reassessment came for 3 domains and the 6 kingdoms within them

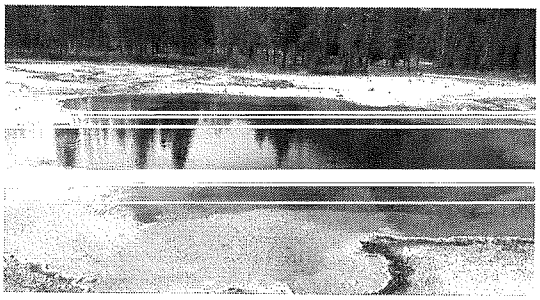
There are currently 3 Domains:



1. Domain Eukarya: **eukaryotic** cell structure – all plants & animals – 4 kingdoms

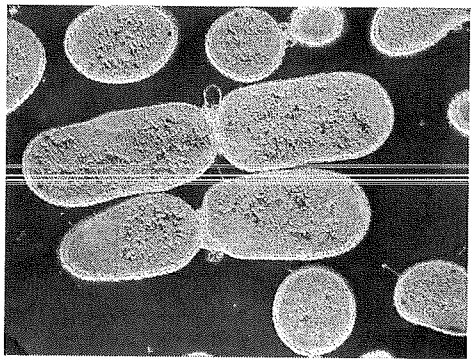
- Multicellular organisms
- Kingdom plants
- Kingdom fungi
- Kingdom protists
- Kingdom animals

2. Domain Archaea: Kingdom archaea



- Single - celled organisms
- Can live in very extreme conditions (too salty, acidic, hot, cold)
- I.e. Volcanic thermal vents in the ocean

3. Domain Bacteria: Kingdom bacteria



- single - celled organisms
- I.e. Streptococci = strep throat
- Can also help produce many antibiotics, vitamins and yogurt.