

# WHAT DO BIOLOGY MEAN?

---

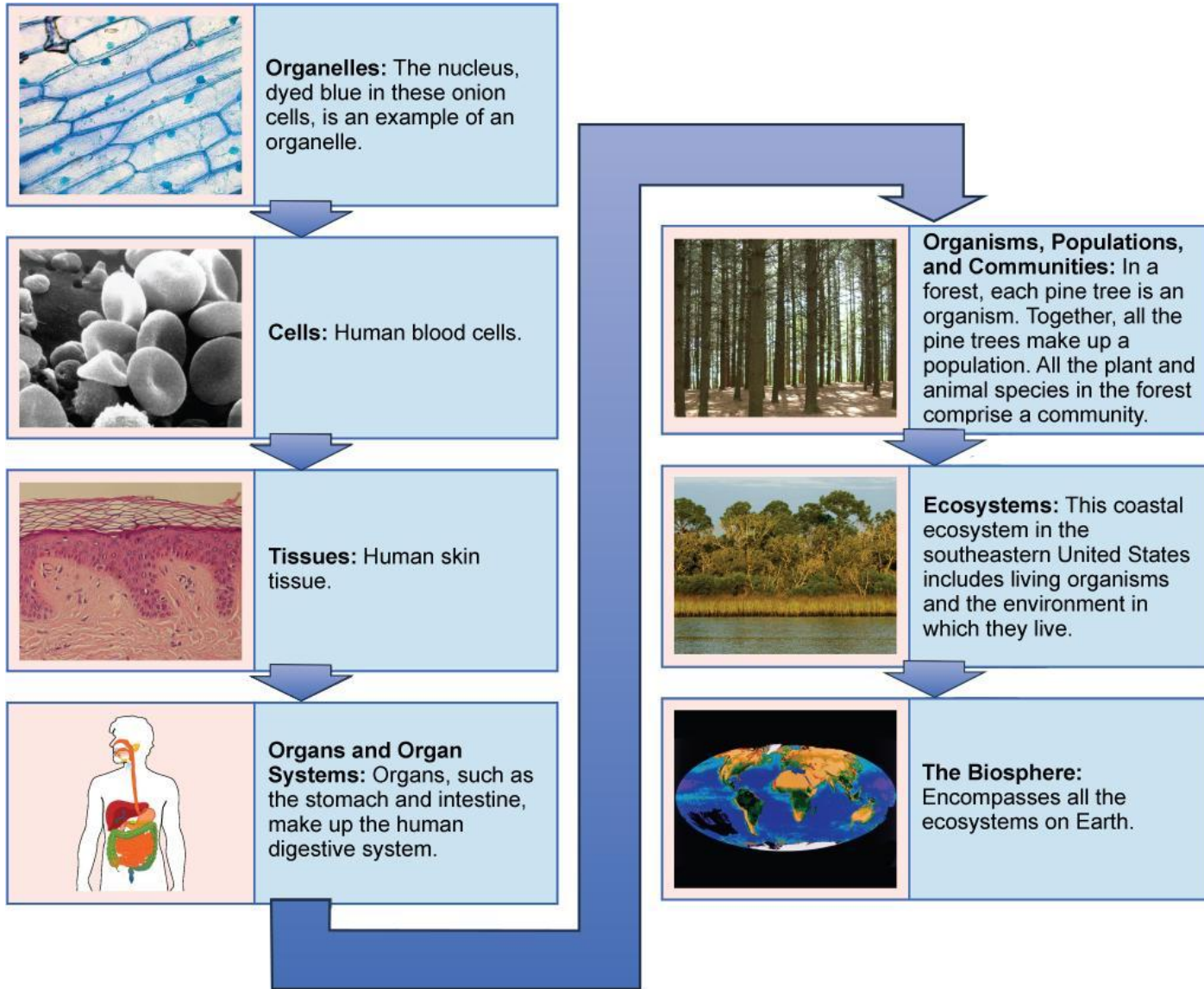
- **Etymology**

- **bios**=life
- **logos**= argument

- **Biology: natural science concerned with the study of life and living organisms**



# *The biological levels of organization of living things*



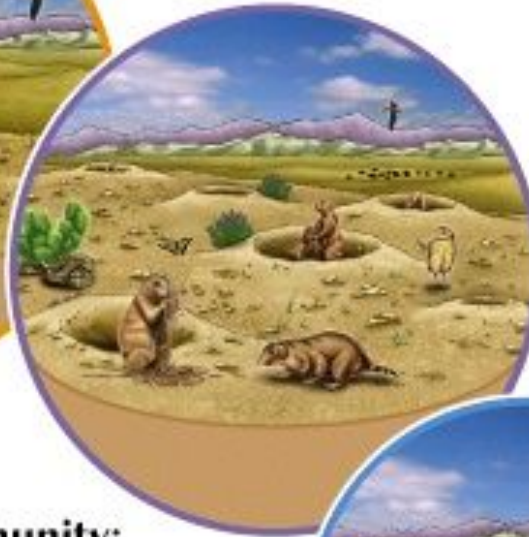
From a single organelle to the entire biosphere, living organisms are parts of a highly structured hierarchy



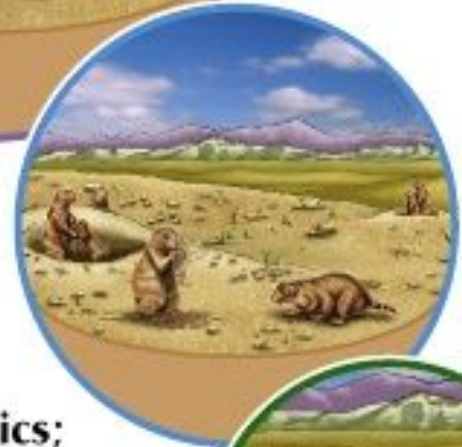
**Biosphere:**  
Global processes



**Ecosystem:**  
Energy flux and cycling  
of nutrients



**Community:**  
Interactions among  
populations



**Population:**  
Population dynamics;  
the unit of evolution

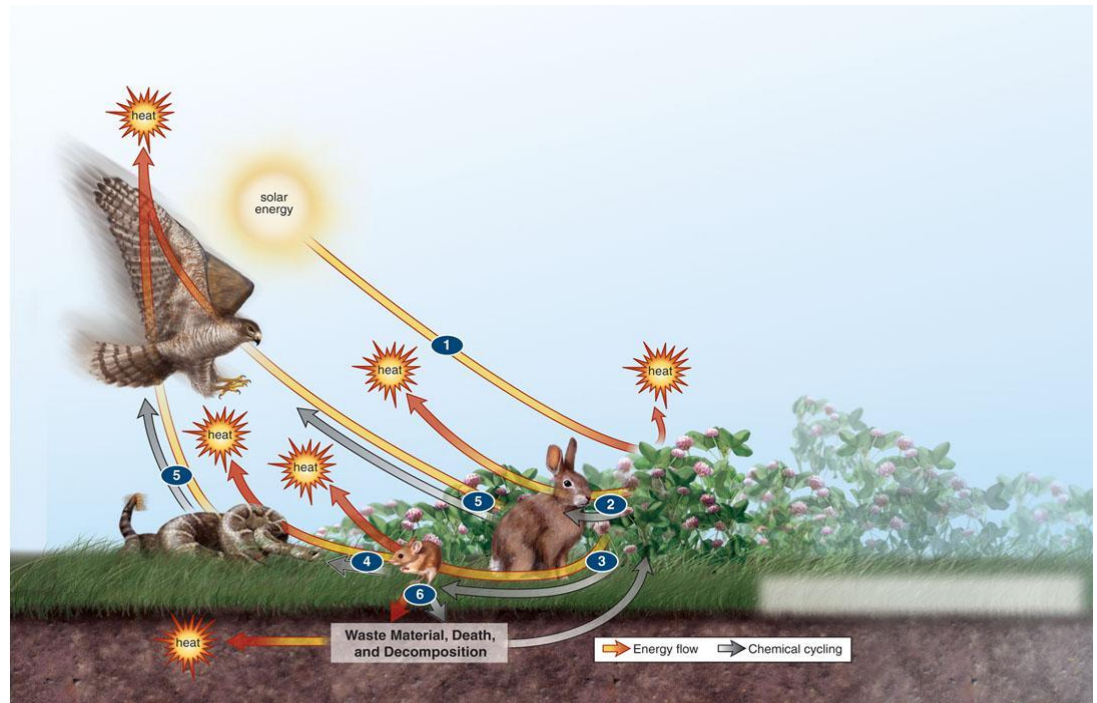


**Organism:**  
Survival and reproduction;  
the unit of natural selection



# The Biosphere

The most complex level of organization composed of



- **Populations:** all members of one species in one area
- **Communities:** the populations of various organisms in an area
- **Ecosystem:** the communities interacting with their physical environment

## 4.Acquisition of Materials and Energy

- Producers, Consumers, and Decomposers in the Forest Community.**

- Organisms need nutrients and energy to live through food**
- Nutrients**, the building blocks of cells;
- Energy**, the capacity to do work, our fuel;
- Metabolism**: all chemical reactions that occur in a cell;
- Photosynthesis**: plant process that transforms solar energy into chemical used by organisms.

# ***Producers***

---

- **A: Producers:** Photosynthesizing organisms
- Producers are any kind of green plant.
- Green plants make their food by taking sunlight and using the energy to make sugar.
- The plant uses this sugar, also called glucose to make many things, such as wood, leaves, roots, and bark.





# Consumers

Figure: Living things acquire materials and energy through food and they reproduce

---

- Cannot make their own food.
- They get energy and nutrients by feeding on other organisms.
- Animals are consumers



# *Taxonomy*

The discipline of identifying and classifying organisms according to their evolutionary history and relationships.

Organisms are grouped together into **taxa** (singular: taxon) and these groups are given a **taxonomic rank**.

## Levels of classification (specific to general):

Species (вид),

Genus (род),

Family (семейство),

Order (Ряд),

Class (класс),

Phylum (тип),

Kingdom (царство),

Domain (надцарство)



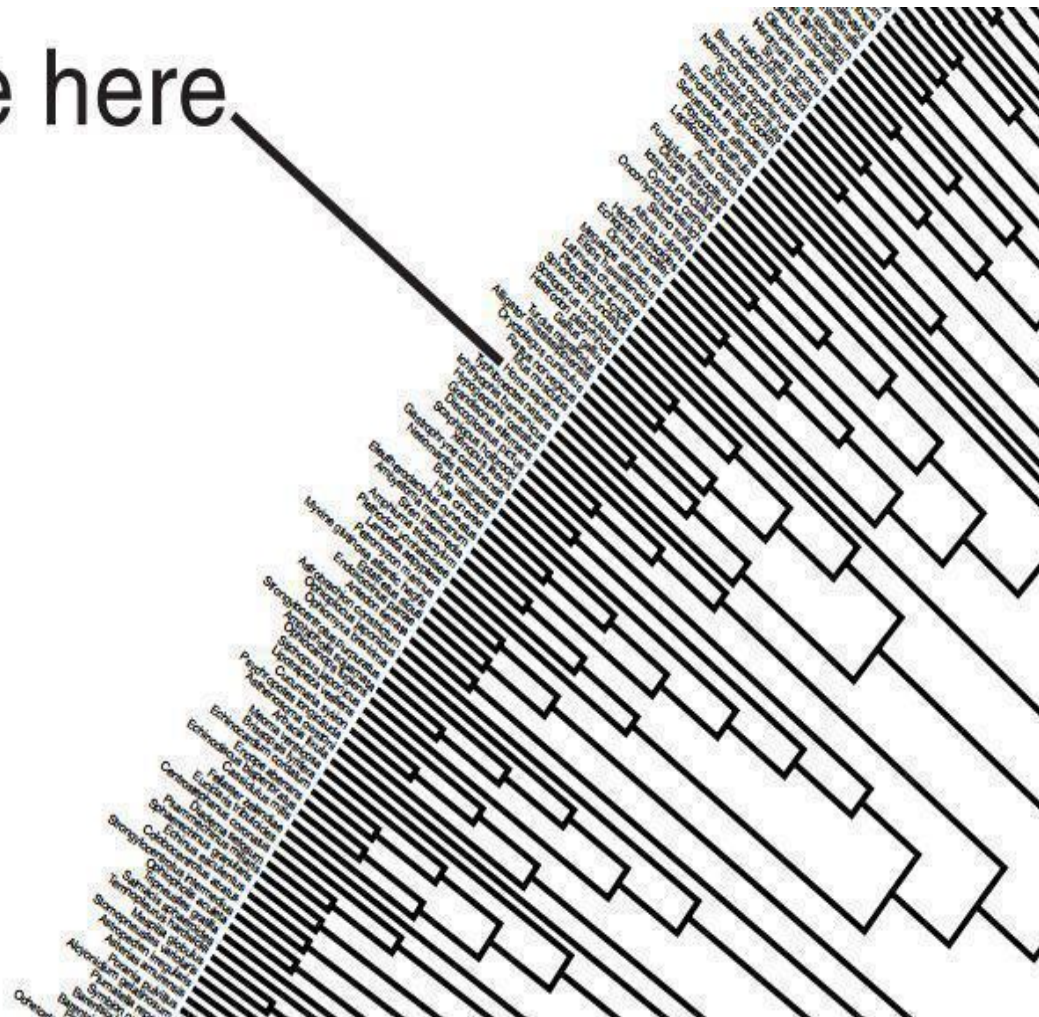
## Table 1.4 Levels of Classification

**TABLE 1.4 Levels of Classification**

Category	Human	Corn
Domain	Eukarya	Eukarya
Kingdom	Animalia	Plantae
Phylum	Chordata	Anthophyta
Class	Mammalia	Monocotyledones
Order	Primates	Commelinales
Family	Hominidae	Poaceae
Genus	<i>Homo</i>	<i>Zea</i>
Species*	<i>H. sapiens</i>	<i>Z. mays</i>

\*To specify an organism, you must use the full binomial name, such as *Homo sapiens*.

# You are here,



# Domain

In Nature we find Three domains:

- **Bacteria**
- **Archea**
- **Eukarya**

*Bacteria and Archaea* are **prokaryotes**  
single cell organism in which the DNA  
is not contained in a nucleus

*Eukarya* are **eukaryotes** and have  
membrane-bound nucleus



Figure. Domain  
Archaea:  
*Methanosarcina*  
*mazei*, an  
archaeon



single  
archaeon

Figure.  
*Domain*  
*Bacteria:*  
Escherichia  
coli, a  
bacterium.



— single  
bacterium

# Four Steps of the Scientific Methods

- **Observation:** what scientists can sense in the world around them
- **Hypothesis:** a proposed explanation for an observation of how a natural process works.
- **Testing:** using either observation or experimentation to disprove a hypothesis
- **Conclusion:** the results are analyzed and the hypothesis is supported or rejected



# Terminology

---

- Control group – In an experiment, a group to which one or more experimental groups can be compared.
- Experiment – A test carried out under controlled conditions that the researcher can manipulate.
- Experimental group- A group of objects or individuals that display or are exposed to a variable under investigation
- Variable (va'riabl)- a characteristic or event that differs among individuals.
- Sampling error- Distortion of experimental results, often because the sample size is too small.

