

# CHAPTER 1

Biology: Exploring  
Life

# WHY BIOLOGY?

- ◉ درک جهان پیرامونی
- ◉ تصمیم گیری های آگاهانه
  - خود
  - خانواده
  - پزشکی
  - رژیم
- ◉ اظهار نظر کردن های آگاهانه
- ◉ درک اهمیت کارهای به انجام رسیده

## DEFINITION

- ◉ *Bios* = حیات، زندگی
- ◉ *ology* = مطالعه کردن
- ◉ *Biology* = علم مطالعه حیات

# ORGANIZATION OF LIFE

Atom (اتم)

- Carbon

Molecule (ملکول)

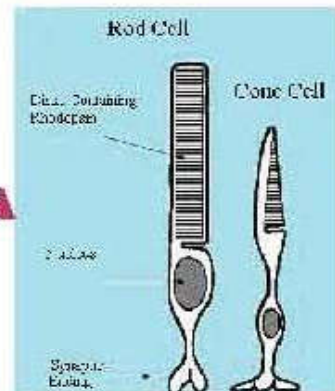
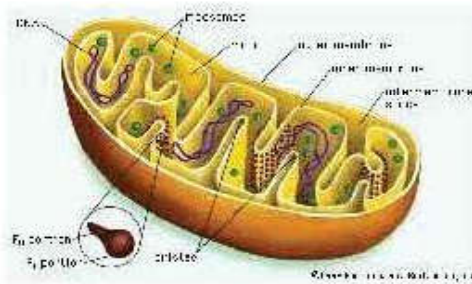
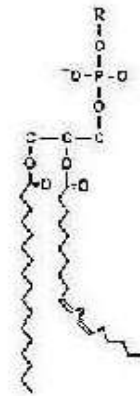
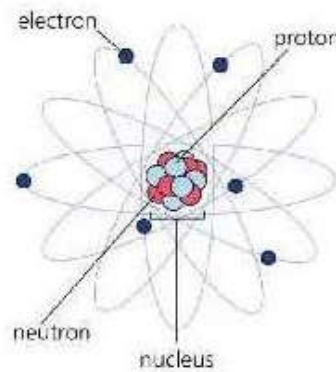
- Lipid

Organelle (اندامک)

- Mitochondrion

Cell (یاخته)

- Eye receptor



# ORGANIZATION OF LIFE

## • Tissue (بافت)

- Nervous

## • Organ (اندام)

- Eye (multiple tissues)

## • Organ system (دستگاه)

- Visual system (multiple organs: eye, tear ducts, eyelids, brain, etc.)

## • Multicelled organism

(پُرسلولی)

- Sparrow

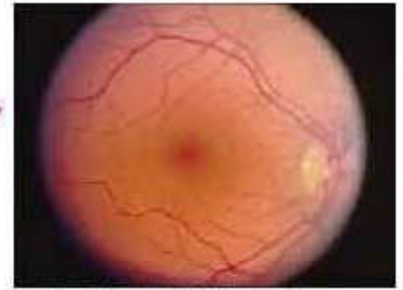
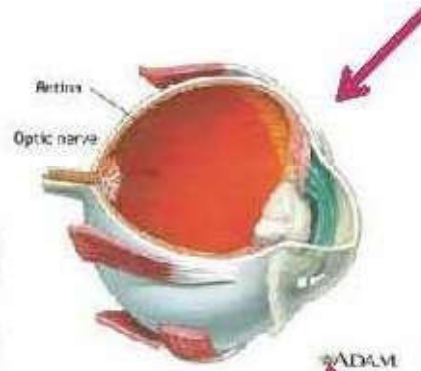
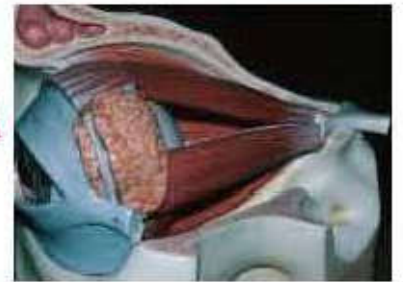


Fig. 23.15. Microscopic systems of the retina show the muscle tube (system around lens).



# ORGANIZATION OF LIFE

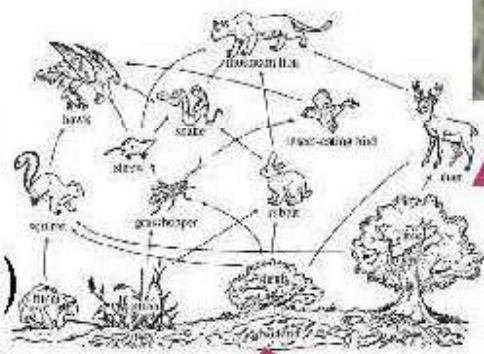
## Population (جمعیت)

- All sparrows in a forest



## Community (جامعه)

- All living things in the same forest



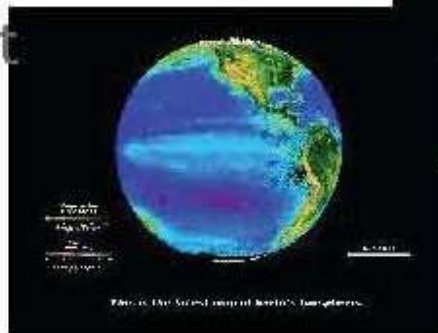
## Ecosystem (بوم سازگان)

- All living & nonliving (soil, water, etc.) things in a geographical area



## Biosphere (زیست گره)

- Everything on Earth that supports life



# INTERACTION OF LIFE

● تولیدکنندگان (Producers): تولید غذا برای اکوسیستم

- Plants
- Photosynthesis

● مصرف کنندگان (Consumers): خوردن / هضم سایر

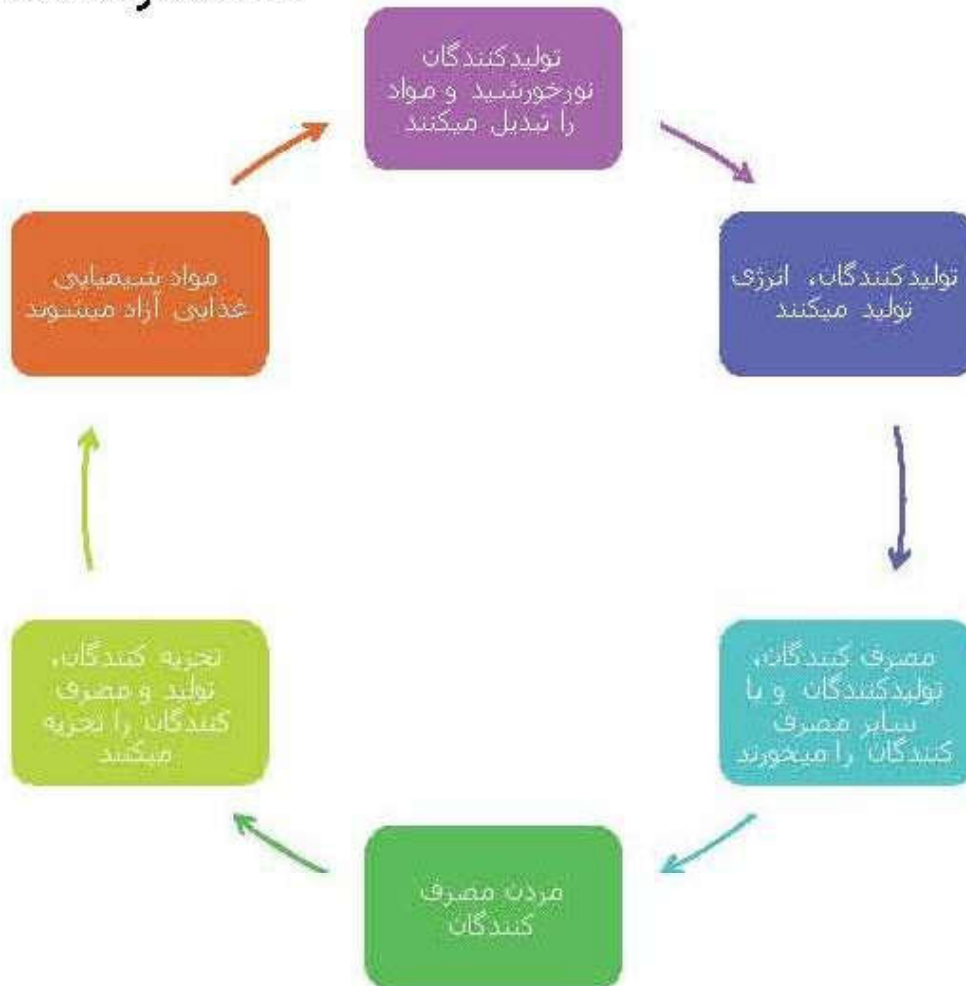
- Eat other animals

● تجزیه کنندگان (Decomposers): تجزیه تولیدکنندگان  
مصرف کنندگان مُرده

- Recycle chemical nutrients
- Fungi

# INTERACTION OF LIFE

## Cycle in ecosystem

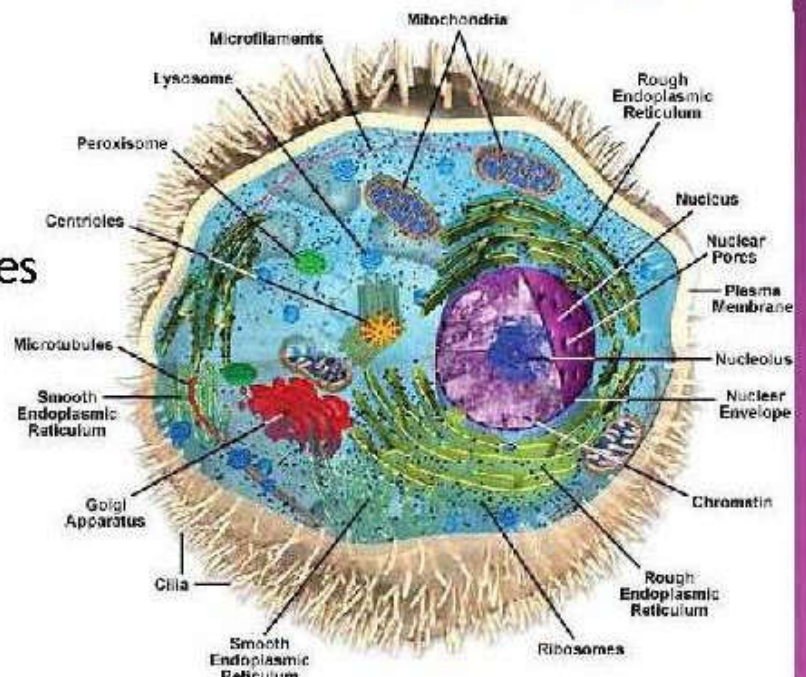
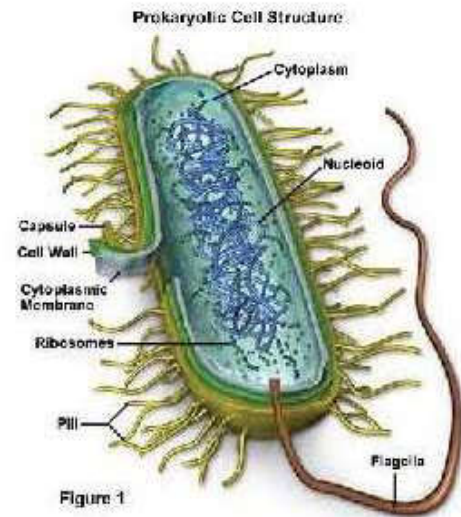




# UNIT OF LIFE

## Cell (ياخته)

- Basic functional unit of life
- Prokaryotic
  - Small, very simple
  - Bacteria
- Eukaryotic
  - Complex
  - Organelles with membranes
  - Plants, animals, fungi



# CHARACTERISTICS OF LIFE

- ◉ Shared by all living things regardless of the form or complexity of life
- ◉ Order (نظم)
  - Organization
- ◉ Regulation (تنظیم)
  - Maintain internal environment
- ◉ Growth & Development (رشد و نمو)
  - Change with age during lifetime
- ◉ Energy Processing (بشرد یا تبدیل انرژی)
  - Metabolism
  - Take in energy, transform to maintain life

# CHARACTERISTICS OF LIFE

## ◉ Response to Environment (باسبخ به محیط)

- Environmental stimuli affect organism
- Sweating, chills

## ◉ Reproduction (تولید مثل)

- Method to pass on genetic information
- Sexual, asexual

## ◉ Adaptation (سازش)

- Traits that aid survival are passed to next generation

# CHARACTERISTICS OF LIFE

◉ In summary, living organisms must....

- Have organization
- Regulate themselves
- Grow
- Metabolize
- Respond
- Reproduce
- Adapt

