



Characteristics of Living Things



Characteristics of Living Things?

Alive or not alive?



Characteristics of Living Things?

All living things exhibit several characteristics in combination.



The Building Blocks of Life

All living things are made of the same *ELEMENTS*:

- Carbon
- Hydrogen
- Nitrogen
- Oxygen



Organization

All life is organized the same way!

Organization

MULTICELLULAR ORGANISM

ORGAN SYSTEM

ORGAN

TISSUE

CELL

ORGANELLE

MOLECULE

ATOM (*smallest*)

Biome "the world's major communities, classified according to the predominant vegetation and characterized by adaptations of organisms to that particular environment" (Campbell 1996)



Biosphere
Parts of the planet and its atmosphere where life is possible.

Ecosystem
The living and nonliving environment. (The community of life, plus soil, rocks, water, air, etc.)



Community
All organisms in a given place and time.

Population
A group of the same type of organism living in the same place and time.



Multicellular organism
A living individual.

Organ system
Organs connected physically or chemically that function together.





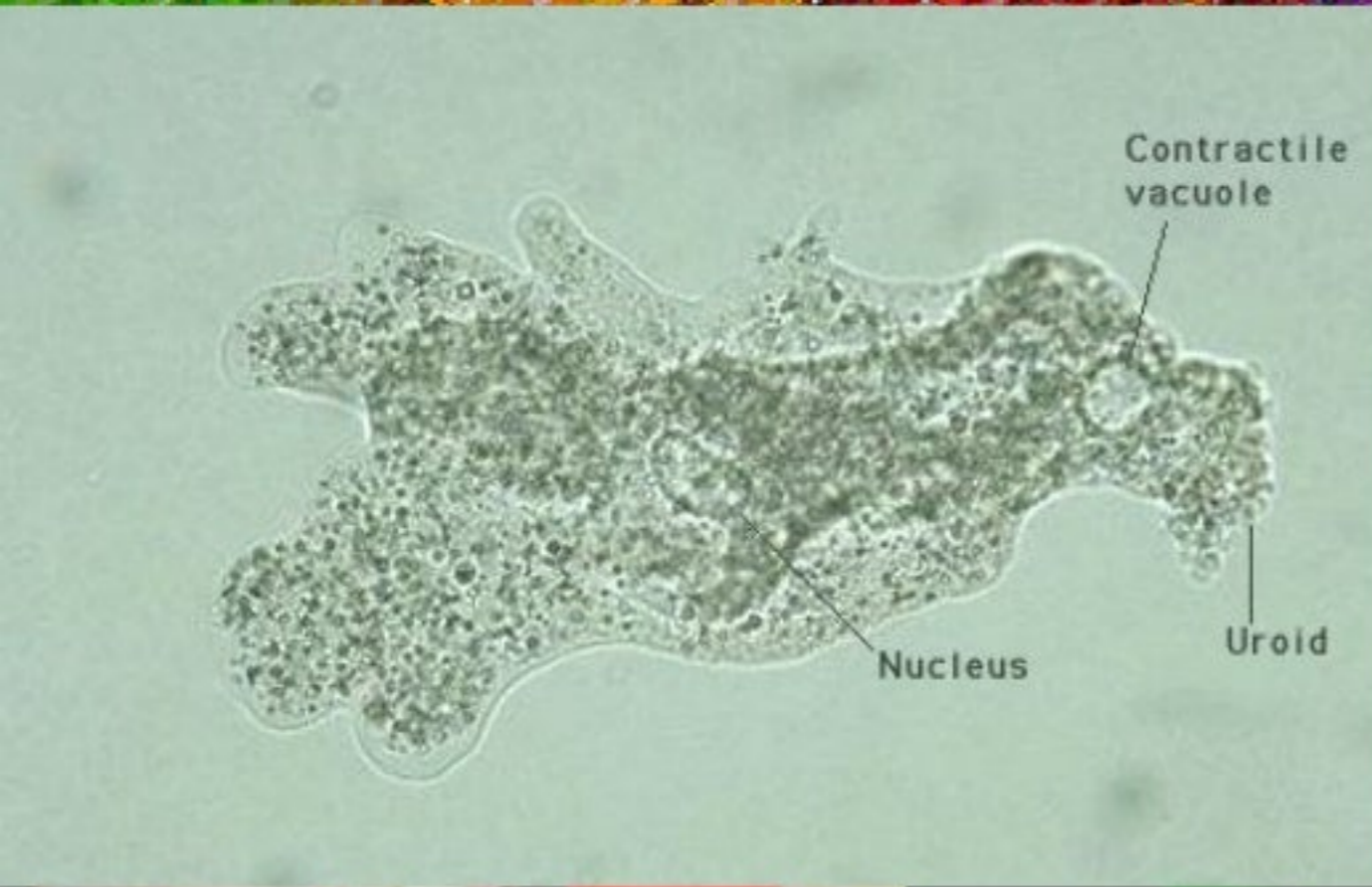
**CHARACTERISTICS
OF LIVING THINGS
(Organisms)**

CHARACTERISTICS OF LIVING THINGS

1. Are made up of cells

Unicellular – organisms that are made of only one cell

Multicellular – organisms that are made of more than one cell



CHARACTERISTICS OF LIVING THINGS

2. Reproduce to produce new organisms

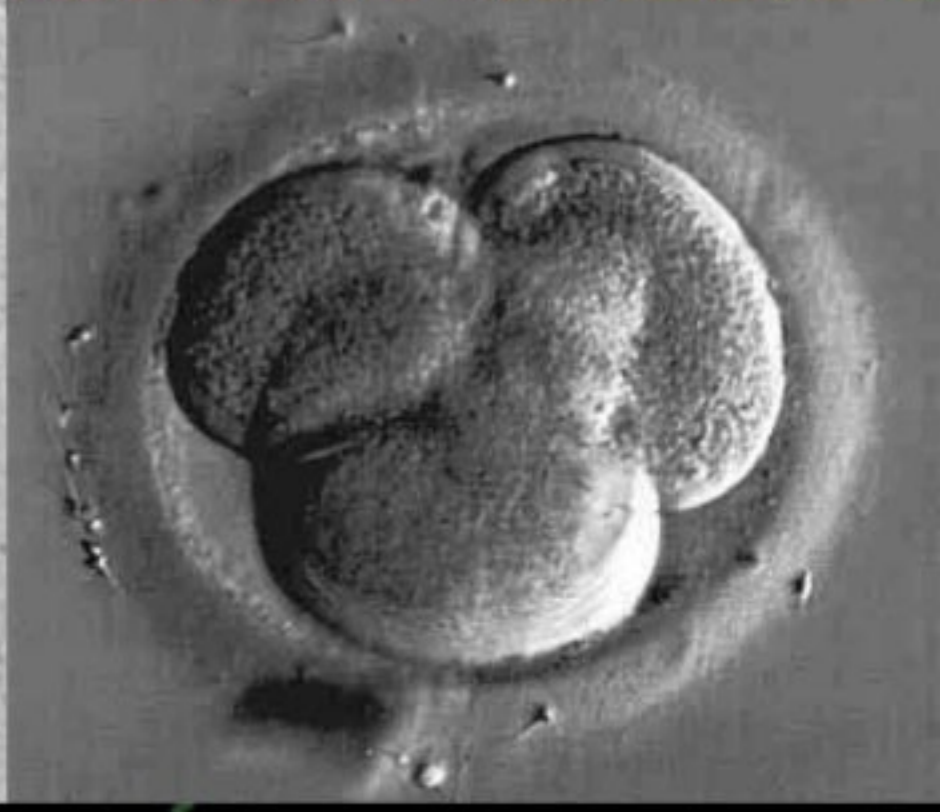
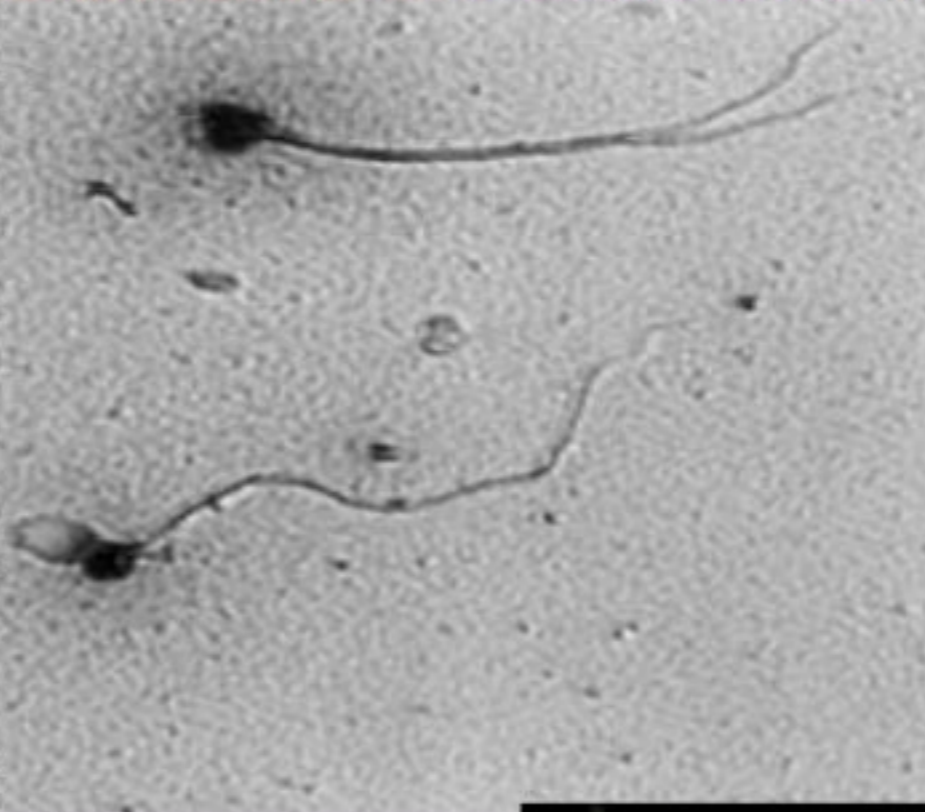
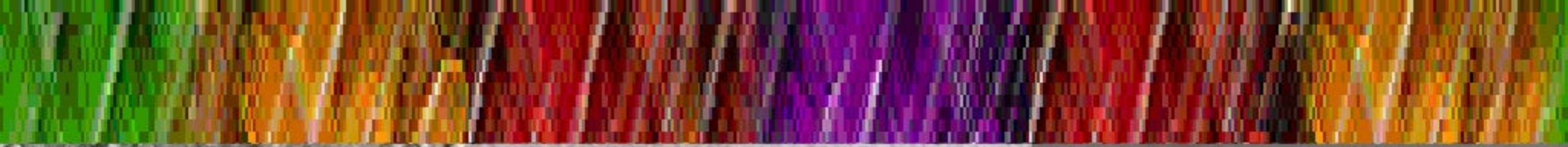
Asexual reproduction - involves a single parent; progeny are genetically identical to the parent.

Sexual reproduction - involves 2 parents; progeny are genetically diverse.



3. Common Genetic Code

- All living organisms use the same language to pass genetic info on to offspring.
- DNA & RNA contain the code.



CHARACTERISTICS OF LIVING THINGS

4. Growth, Development and Aging

Growth – some cells get larger and other new cells are added

Development – cells and body parts become specialized for certain jobs

Aging – cells and body parts become damaged and cannot be repaired

Ovum (egg)



Larva (caterpillar)



Pupa (chrysalis)



Imago (adult)

THE LIFE CYCLE OF A SWALLOWTAIL





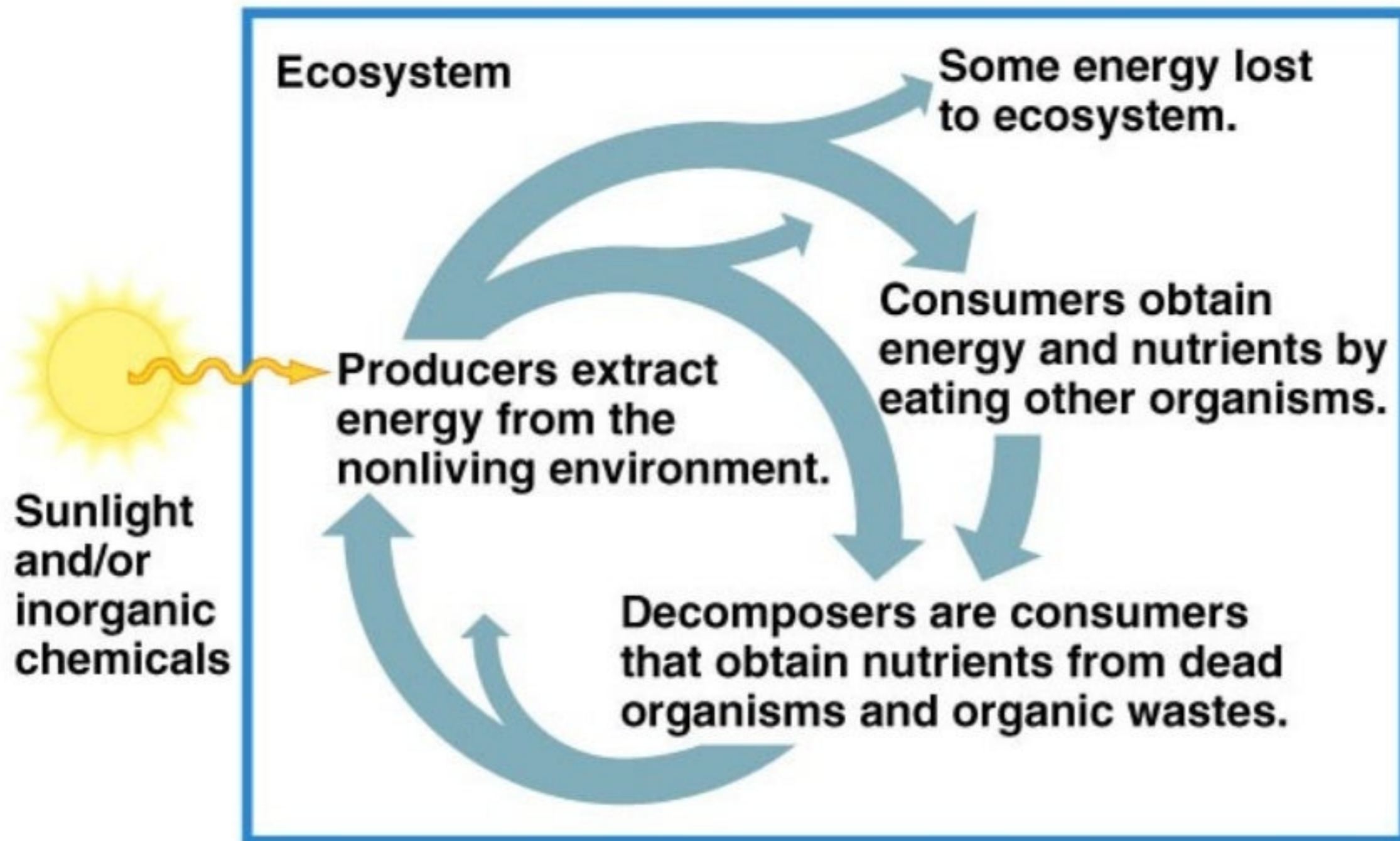
Energy Use & Metabolism

Metabolism - biochemical reactions that acquire & use energy.

Why do organisms need energy?

How do organisms obtain energy?

Energy Flow is Connected





CHARACTERISTICS OF LIVING THINGS

5. Obtain and Use Energy from Environment

Autotroph – organism that can make its own food from its environment

Heterotroph – organism that has to obtain its energy from another organism



Spirogyra



CHARACTERISTICS OF LIVING THINGS

6. Respond to the Environment

Stimulus – anything in the environment that causes a reaction from an organism

Response – automatic reaction to a stimulus

Behavior – learned or inherited response to a stimulus

CHARACTERISTICS OF LIVING THINGS

Irritability - *immediate response to a stimulus.*



7. Maintain a stable internal environment (homeostasis)

Homeostasis - the ability of an organism to maintain its internal environment despite conditions in the external environment.

Human body temperature is.....

- if body temperature rises, you sweat.**
- if body temperature lowers, you shiver.**



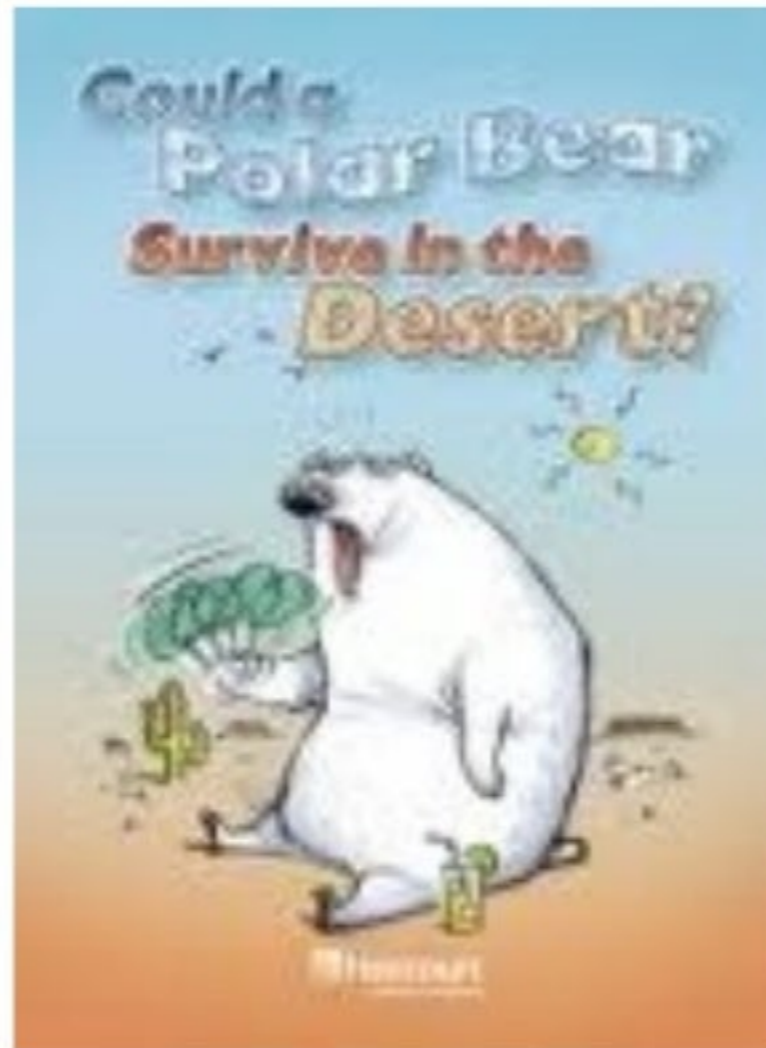


When your body gets too warm due to activity or stress, you will sweat to cool it down.



8. As a group, living things change over time.

- Organisms adapt to their environment in order to survive!



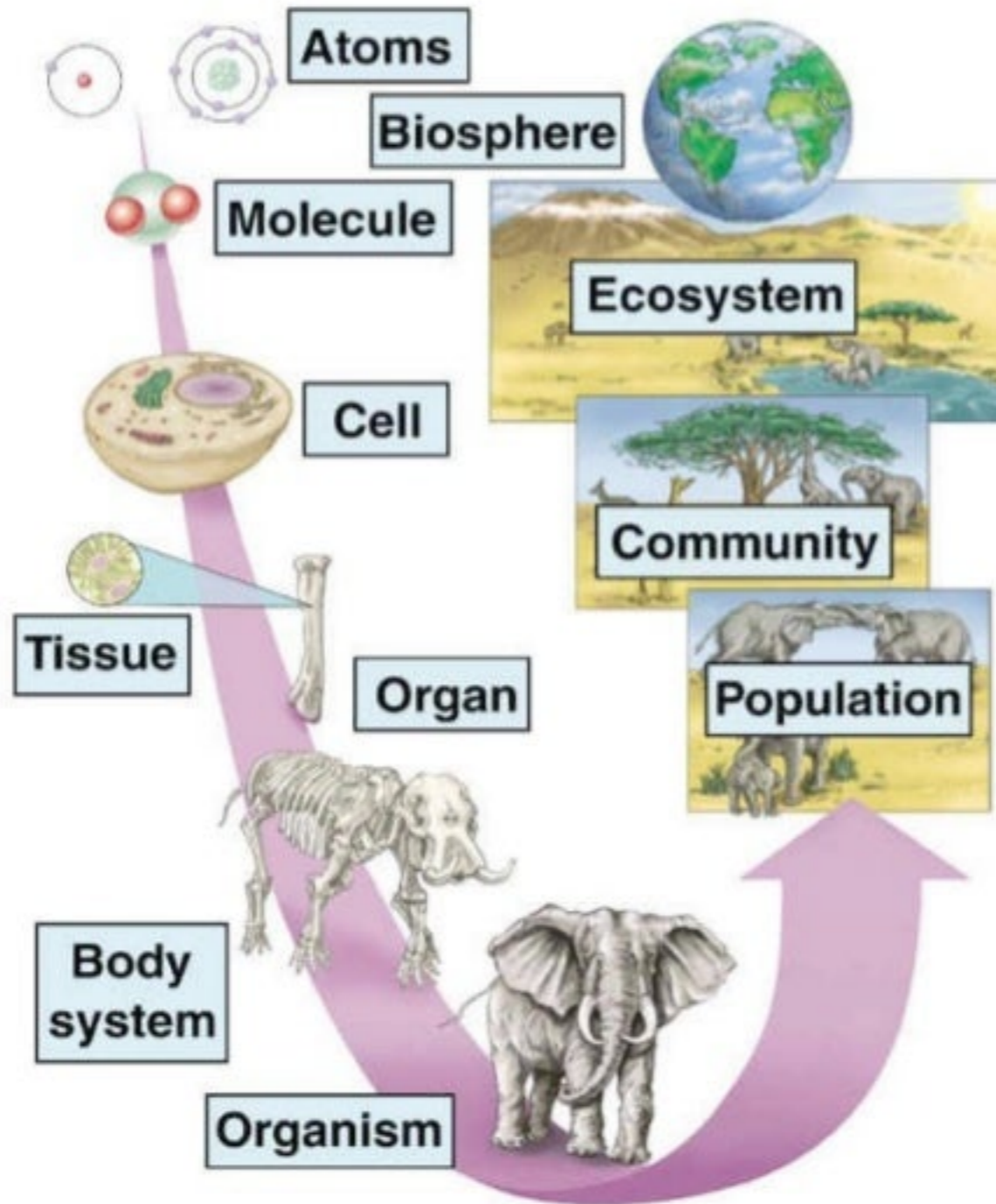
Living things are **VERY** organized!

Can you guess the smallest part of a living organism?

Hint: It's so tiny that you can't see it!!



Raven/Berg, Environment, 3/e
Figure 4.1



Levels of Organization of Biological Study

- Atoms/Molecules
- Cells
- Groups of cells (tissues, organs, organ systems)
- Organism
- Population
- Community
- Ecosystem
- Biosphere