

Characteristics Of Life, The Levels of Organization, and Homeostasis

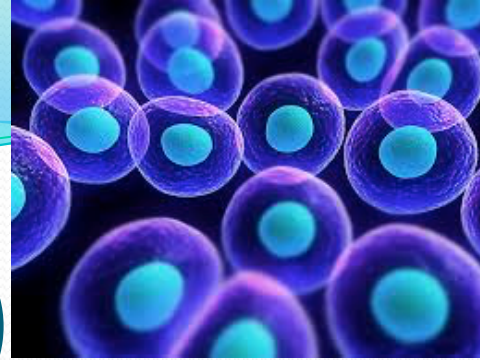
Chap 1.1, 1.3, and 1.4

Biology

- Biology is the study of life
- An Organism refers to anything that possess ALL the characteristics of life



Characteristics Of Life (6)



1. It responds to its environment

- Organisms detect changes in the environment and respond to them

A Stimulus – is something that requires an organism to adjust

A Response – is the reaction that an organism has to a stimulus

2. It grows and develops

- Growth – cells getting bigger and multiplying

-Development – changes in an organism over time

-In order to grow, organisms must obtain energy by either making their own food or eating to live

Characteristics Of Life (6)

3. It produces offspring

- to produce offspring
 - a. sexually (2 parents)
 - b. asexually (1 parent copies itself)
- Reproductions creates species
- A species is a group of organisms that can breed together and produce fertile offspring



4. It maintains homeostasis

- homeostasis is the balance that an organism is trying to maintain with its environment (regulation to maintain suitable conditions)
 - an organism's ability to maintain a stable internal environment (examples: sweating when it's hot, shivering when it's cold)

Characteristics of Life (6)

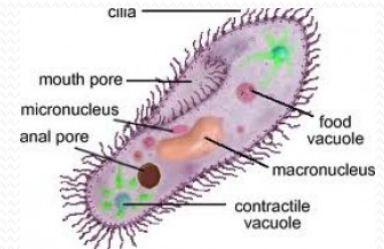


5. It has complex chemistry

- Living things consist of large complex molecules and undergo many complicated chemical changes to stay alive

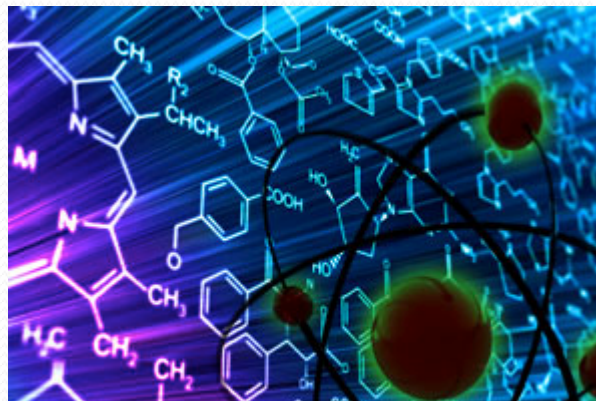
6. It consists of cells

- Organized into cells
 - a. unicellular- one cell (bacteria, algae etc)
 - b. multicellular – many cells (humans, animals most plants)



The Chemistry of Life

- The purpose of all organisms is to survive in its environment long enough to reproduce. In order to survive maintaining a balance with the environment is key. Maintaining homeostasis with the environment can be done both internally and externally. Internal homeostasis is controlled by chemical reactions



Levels of Organization

- All organisms are organized from the smallest parts that work together to create larger structures.
- Single celled organisms, like bacteria, are made of atoms, molecules and organelles that all work together to keep the cell alive

Levels of Organization

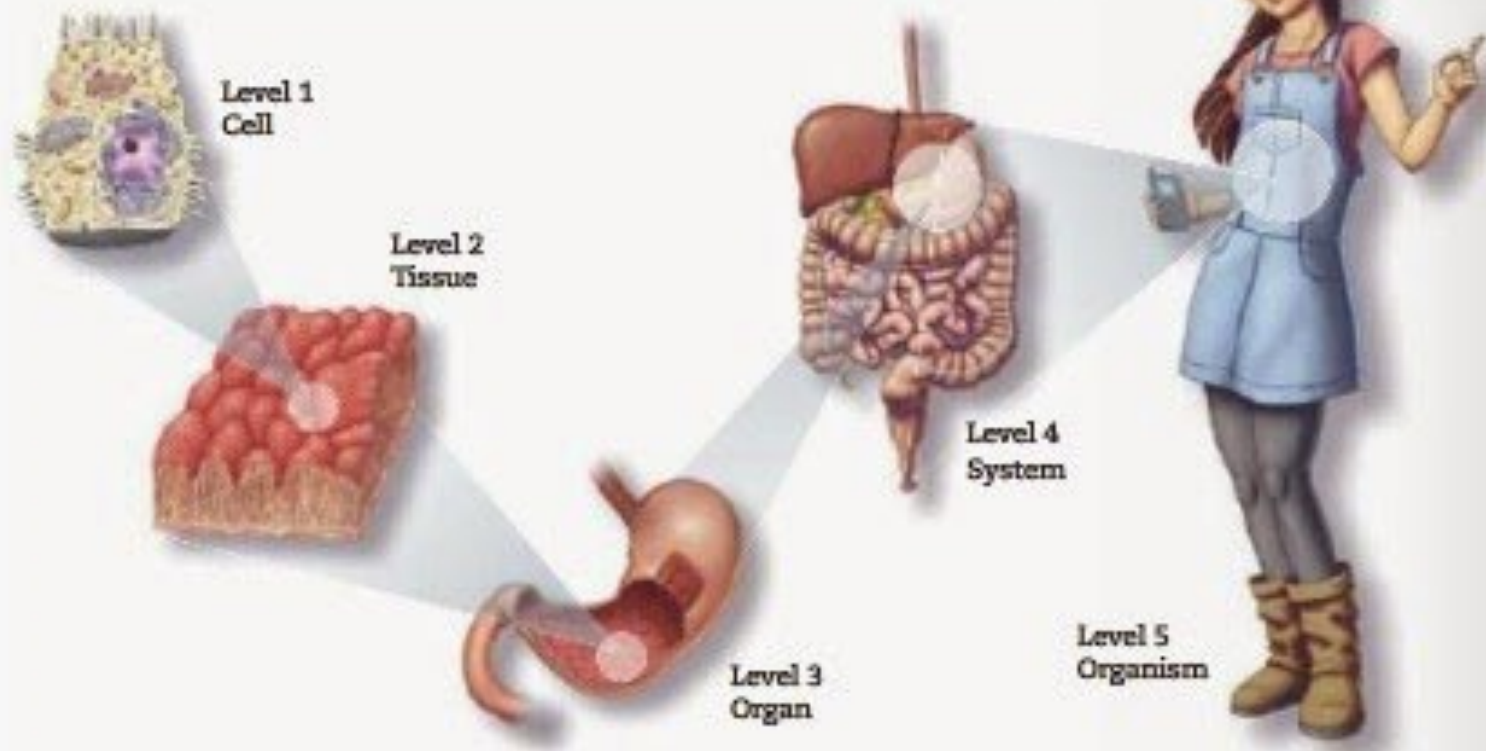
- Multi-celled organisms (plants, animals, fungi) are also organized

● Cells → Tissues → Organs → Organ systems → Organism

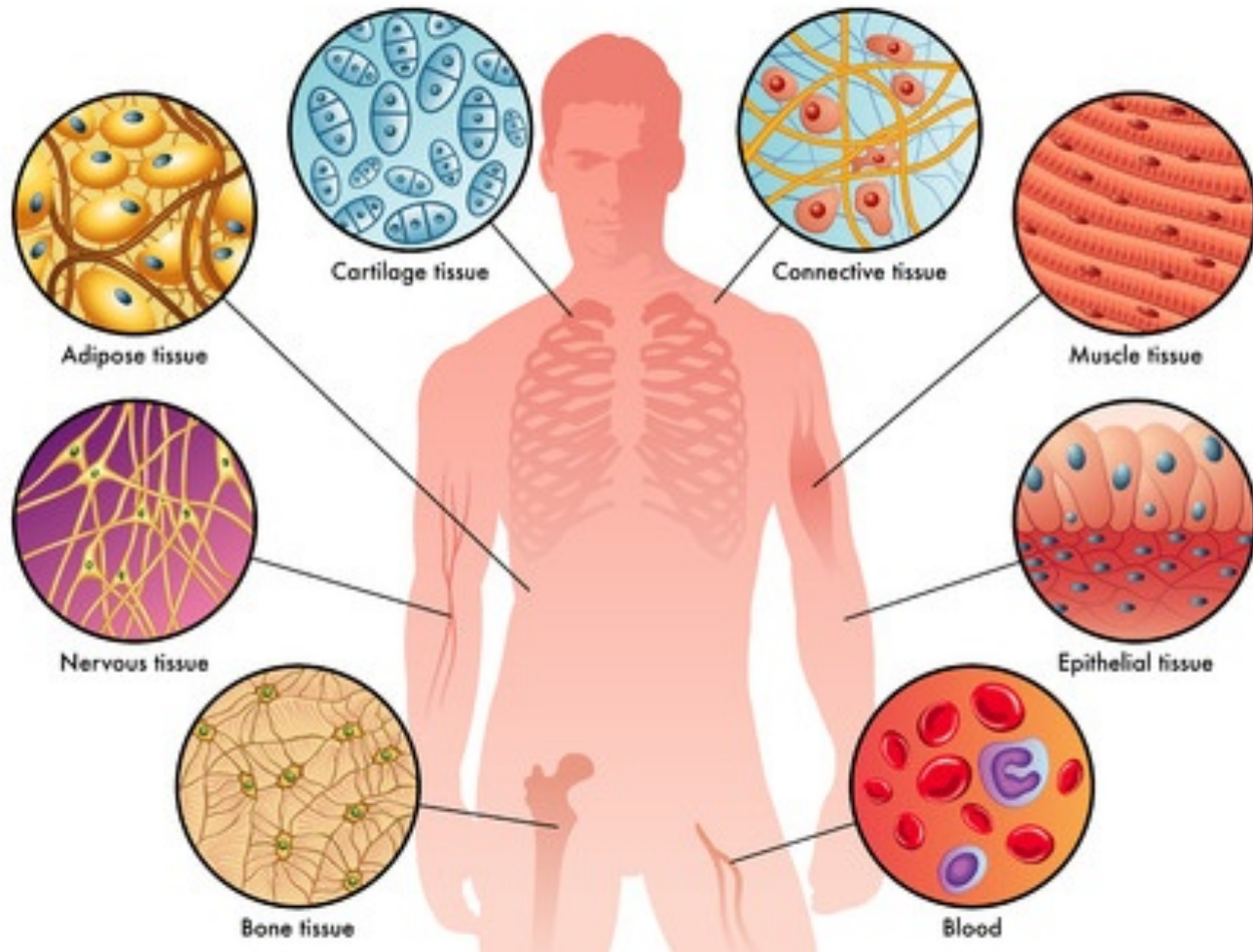
- Many types of cells work together to make tissues
- Tissues work together to create organs
- Organs work together to make organ systems
- Organ systems work together to allow an organism to live and function

Levels of Organization




Levels of organization



Animal Tissue



HUMAN BODY SYSTEM CHART

SYSTEM		FUNCTIONS	ORGANS/Major STRUCTURES
Skeletal		<u>Functions:</u> 1. Supports and protects the body 2. Protect organs 3. Makes blood cells 4. Gives the body the shape 5. Helps body to move	<u>Bones</u> <u>Ligaments:</u> connects bones to bones <u>Cartilage:</u> provides cushion between the bones <u>Red Marrow:</u> makes blood
Muscular		<u>Function:</u> Help the body move <u>Two Types of Muscles:</u> 1. <u>Voluntary Muscles:</u> muscles you CAN control (Skeletal Muscles) 2. <u>Involuntary Muscles:</u> muscles you CANNOT control (smooth and cardiac muscles)	<u>Heart, diaphragm, biceps/triceps</u> <u>Tendon:</u> connects muscle to bones <u>Skeletal Muscles:</u> attached to the bones and helps us move <u>Smooth Muscles:</u> make up most of the organs of our body <u>Cardiac Muscles:</u> make up the heart
Digestive		<u>Function:</u> Breaks down food to make energy for the body <u>*Direction of food movement:</u> Mouth esophagus stomach Sm. Intestine lg. Intestine rectum anus <u>*Peristalsis:</u> muscle movement that moves food through the D.S	<u>Mouth</u> <u>Esophagus:</u> Long tube that connects the mouth to the stomach. <u>Stomach, Liver, Pancreas</u> <u>Small Intestine:</u> where most digestion takes place. <u>Large Intestine:</u> Takes water from the undigested materials <u>Rectum, Anus</u>

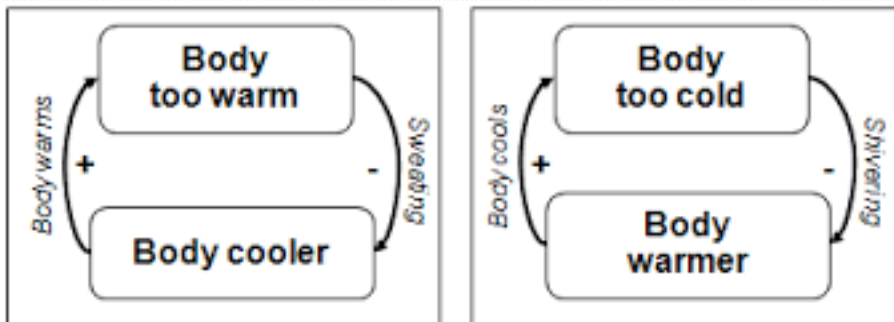
Homeostasis

- Homeostasis- is the process in which organ systems work together to maintain a stable internal environment
- All of the organs and organ systems work with each other to keep a balance in your body so you stay alive
- Examples: blood pressure, pH, water concentration, temperature, hormone levels, oxygen and carbon dioxide levels, blood sugar

How does the body maintain homeostasis?

Feedback Loops!!!

<http://study.com/academy/lesson/what-is-negative-feedback-in-biology-definition-examples.html>

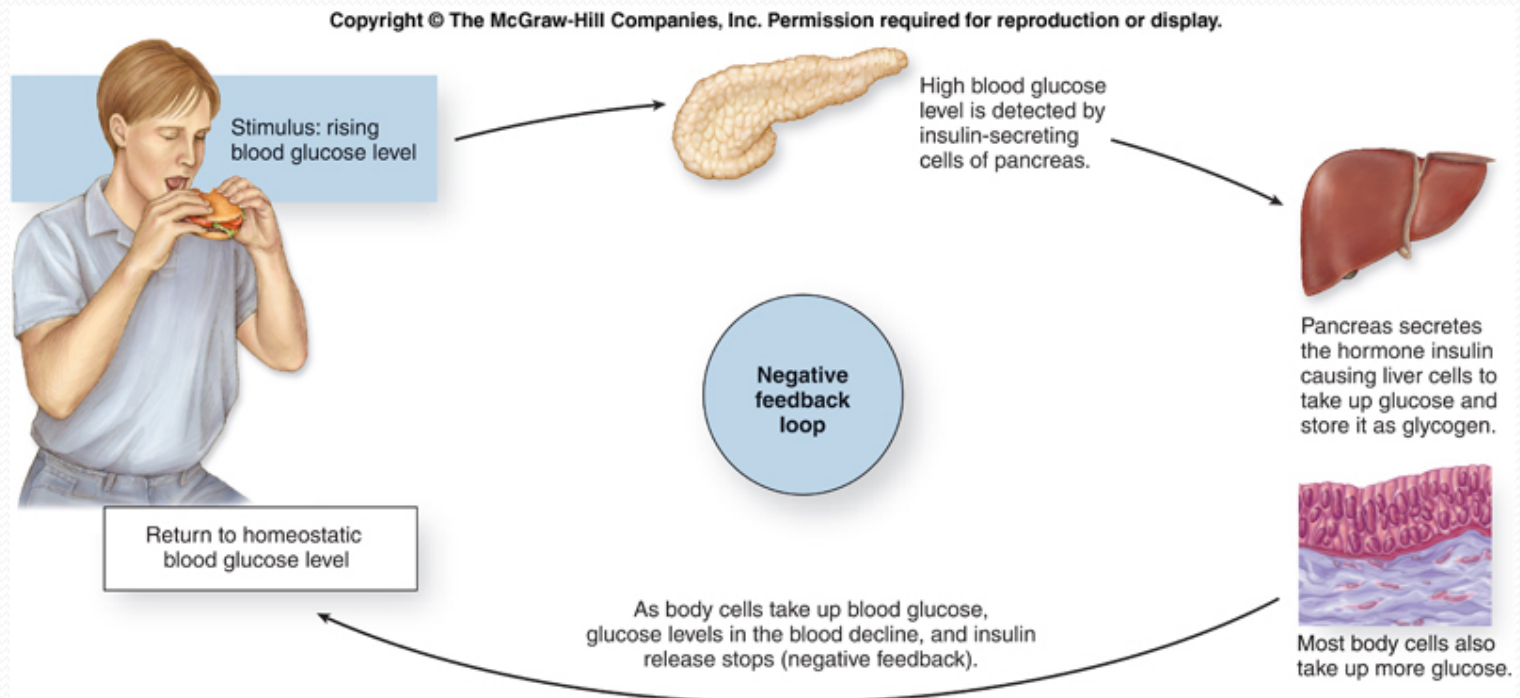


Negative Feedback Loop

- A response to a stimulus that inhibits or stops a change from happening.
- Keeps a balance in the organism
- Decreases the change that is happening
- Most common feedback loop in the body

Negative Feedback Loop

- Examples: shivering when it's cold to get warmer, sweating when it's hot to cool down, producing insulin when your blood sugar gets too high, breathing out when carbon dioxide levels get too high



(a) Negative feedback

Positive Feedback Loop

- A response to a stimulus that reinforces the change that is happening
- It increases the change that is happening
- Takes the organism out of homeostasis

Positive Feedback Loop

- Examples: increasing oxytocin levels to increase contracts while having a baby, increasing clotting factors in the blood to make a scab when you bleed, increasing levels of white blood cells when you are sick

