

# Biology

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Biology - the study of life.

What makes us alive? - atoms, molecules, dna, oxygenated, reproduction, movement, ability to grow, adapt, require outside energy source, organized function,

What makes us human? - Way we move, awareness, complex body structure and brain, emotions, build of existing knowledge, complex thoughts and voicing opinions, way we communicate, dna, ability to tell the difference between right and wrong, ability to use our resources, thumbs.

## **4 Things that make us human**

1. Complex written and spoken language,
2. Large brain
3. Bipedal (stand on 2 legs)
4. opposable thumb

## **Organizations of humans**

Chemistry- atoms and molecules (proteins, lipids, carbs, dna)

Cellular- smallest unit of life

Tissue- groups of similar cell types

Nervous, muscular, connective and epithelial

Organs- made up of all tissue types working together to carry out a specific function (stomach, heart, lungs)

Organ systems- multiple organs working together to perform a specific function within the body

Organism- all organ system working together (endocrine)

## Homeostasis

The ability to maintain a relatively constant internal environment in the body

Despite constant internal external disruptions (temp, blood glucose)

The **nervous** and **endocrine** systems are key in maintaining homeostasis (hormones)

Changes from the normal tolerance limits results in illness or even death

Feedback loops

Feedback loops keep the body informed of any changes and also attempt to correct the situation to restore homeostasis

Factors in a feedback loop:

- Normal controlled condition
- Receptor
- Control center
- Effectors

Normal- receptor-control center(brain)-effectors-to maintain homeostasis

2 mechanisms for maintaining homeostasis

### Negative feedback loop

- Immediately reverses the situation to restore homeostasis

Ex. Blood pressure

Most common

Immediate reversal

### Positive feedback loop

- Must first intensify the situation to restore homeostasis
- Ex. Child birth, blood clot, ovulation

BP-Baroreceptor- hypothalamus-down HR-BP Down

Uterus^contractions-activates stretch rec in the cervix-pituitary-oxytocin^hormone

\*intensification (escalates)

## Chapter 2. Chemistry

**Matter** anything that has weight and takes up space

**Elements** are basic building blocks of matter that cannot be broken down by chemical means

**Atoms** are the smallest units of an element that retain the elements physical and chemical properties. These bond together to form molecules

4 elements make up 96% of the body

H O N C

Other important minerals

K Na Fe Ca Cl I

Subatomic particles of atoms

**Neutrons** have a neutral charge

**Protons** are positively charged

Neutrons and protons make up the nucleus

**Electrons** are electrically charged and orbit around the nucleus in the electron shells

# of pro = # of ele

### **Octet Rule**

An atom can hold 2 electrons in its inner most shell, 8 in the second and 18 in the 3<sup>rd</sup>

However, if an atom have 8 electrons in the 2<sup>nd</sup> or 3<sup>rd</sup> it is stable

If an atom has not satisfied this octet rule, it will react with other atoms to form molecules or compounds