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# Kentucky Class Notes

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**SAMPLE**  
*BIO 150*  
*Course Packet*

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**SAMPLE**

# Biology: The Study of Life

## *How Do We Define Life?*

- Life is something that is constantly growing and developing. For something to be considered alive it must reproduce, have a metabolism, perform respiration, must breath oxygen, must evolve, must have regeneration, life cycles, the ability to grow, must respond to stimuli, and have movement.
- What are the properties of life?
  - Highly ordered and has organization
  - Reproduction
  - Growth and development
  - Metabolic activity
    - Metabolic activity is all the chemical reactions in a living organism.
  - Response to a stimuli
  - Inheritable traits:
    - Inheritable traits are traits that can be passed on from generation to generation.

## *Levels of Biological Order of Living Things*

- From smallest to largest:
  - Molecular (Covered in this class)
  - Cellular (Covered in this class)
  - Tissue
  - Organ
  - Organ systems
  - Organism
  - Population
  - Ecosystem

The monosaccharide is the \_\_\_\_\_ of carbohydrates.

Smallest

\_\_\_\_\_ consist of two sugar molecules.

Disaccharides

Sucrose is a common \_\_\_\_\_

Disaccharide

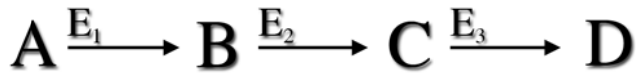
The process of water formation when two sugars break apart is what?

Dehydration synthesis or condensation

Amylopectin is a \_\_\_\_\_.

Complex starch

Figure 2.3



The pathway will stop when there is an excess of product D produced. This is because product D acts as an inhibitor on enzyme one to help regulate the reaction.

## Oxidation-Reduction Reactions

- Oxidation-reduction reactions deal with the movement of electrons.
- Oxidation is the process of losing an electron
- Reduction is the process of gaining an electron
  - In each chemical equation there is an oxidized molecule and a reduced molecule.
  - The molecule that is oxidized is known as the reducing agent because it gives its lost electrons to another molecule in the equation.
  - Therefore, the molecule that is reduced is known as the oxidizing agent because it takes an electron from the molecule that was oxidized.
- In biology, a biological oxidation-reduction has two forms of molecules that are often reduced. These are
  - NAD<sup>+</sup> and FAD.
  - NAD<sup>+</sup> is reduced to form NADH and FAD is reduced to form FADH<sub>2</sub>. For example
    - $NAD^+ + 2e^- + 2H^+ \rightarrow NADH + H^+$  is an example of a reduced molecule or an oxidizing agent.
    - NADH has more free energy associated with it because it has the most electrons.
- When a molecule is reduced, three things must happen:
  - The molecule gains electrons
  - It usually gains electrons in the form of hydrogen
  - There is also a net energy gain.

- 25.) Charles Darwin's final and major conclusion was that new species gradually result from the accumulation of \_\_\_\_\_ favorable conditions.
- 26.) All proteins contain a \_\_\_\_\_ group, a \_\_\_\_\_ group, hydrogen, and an R group.
- 27.) The smallest of the carbohydrates is the \_\_\_\_\_.
- 28.) A pH of 5 is how many times more \_\_\_\_\_ than a solution with a pH of 7?
- 29.) The presence of a \_\_\_\_\_ in a prokaryotic cell helps the bacteria avoid phagocytosis.
- 30.) \_\_\_\_\_ processes are going from an area of high concentration to an area of low concentration.
- 31.) Thomas Malthus predicted that the human population would increase faster than the food supply causing a \_\_\_\_\_.
- 32.) Most are single celled prokaryotic cells in this domain: \_\_\_\_\_.
- 33.) Gram negative cells have a lipid bi-layer made of \_\_\_\_\_ and a single layer of peptidoglycan between the bi-layer and the cell membrane.
- 34.) \_\_\_\_\_ is when scientists single out desirable genes in order to create a better version of that organism. \_\_\_\_\_ flagella found in spiral shaped bacteria.
- 35.) \_\_\_\_\_ is all the chemical reactions in a living organism.
- 36.) This type of cell contains a nucleus: \_\_\_\_\_.
- 37.) Protista, Animalia, Fungae, and Plantae fall under the domain \_\_\_\_\_.
- 38.) This group is considered to be the linking group between prokaryotic and eukaryotic organisms: \_\_\_\_\_.
- 39.) \_\_\_\_\_ is the number and relative abundance of a certain species in a biological community.
- 40.) A \_\_\_\_\_ is a possible explanation for what has occurred. .