

Biology I – Unit 2 Study Guide

bio1u2sg (Biochemistry)

Learning Objectives (things to learn):

1. Recognize that cells are composed primarily of a few elements (carbon, hydrogen, oxygen, nitrogen, phosphorus, and sulfur).
 - What is unique about carbon atoms?
 - Describe what functional groups are and how they change the nature of a molecule.
2. Summarize how large carbon molecules are synthesized and broken down.
 - Compare and contrast a monomer and polymer.
 - Compare and contrast condensation reaction and hydrolysis.
3. What is a carbohydrate?
 - Distinguish between monosaccharide, disaccharide, and polysaccharide
 - What role do carbohydrates play in living systems?
4. Recognize that the work of the cell is carried out primarily by proteins, most of which are enzymes, and that protein function depends on the amino acid sequence and the shape it takes as a consequence of the interactions between those amino acids.
 - Explain the relationship between amino acids and protein structure.
 - Why are proteins important macromolecules?
 - Why is the shape of the protein so important?
5. What are enzymes?
 - Describe nature of enzymes and their importance in chemical reactions.
 - Describe how the induced fit model of enzyme action works.
6. What are lipids?
 - Define lipids.
 - Construct a table comparing the structure and function of each of the different types of lipids:
 - ✓ Fatty Acids
 - ✓ Triglycerides
 - ✓ Phospholipids
 - ✓ Waxes
 - ✓ Steroids
7. Describe the structures and roles of nucleic acids.
 - Name the two main kinds of nucleic acid.
 - What is the connection between nucleic acids and proteins?

Terms to be familiar with:

organic monomer inorganic polymer lipid carbohydrate monosaccharide disaccharide
polysaccharide hormone fatty acid protein amino acid enzyme catalyst substrate active site
functional groups macromolecule condensation reaction hydrolysis peptide bond triglyceride
phospholipid wax steroid nucleotide DNA RNA

To Do:

- Resources: Modern Biology (pages 51-60); articles; slides; www.hsph.harvard.edu/nutritionsource/
- Notebook:
 - Notes(Input) on Learning Objectives
 - Reflections
- Molecular Computer Model (submit in Moodle)
- Activity: Saponification (Exploration/Application/History)
- Lab Conclusion: Catalysts of Life **10pts**
- Biochemistry Online Quiz **20pts**
- Biochemistry Exam **20pts**

Group: 14/IVA/IVB

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12.011

Electron
Configuration:

$1s^2$

$2s^2p^2$

Oxidation
States:

+2

+4

-4

C

Carbon

H																								He
Li	Be												B	C	N	O	F	Ne						
Na	Mg												Al	Si	P	S	Cl	Ar						
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr							
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe							
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn							
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Uuu	Uub							Uuq						
			Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu								
			Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr								