

Elements of Life & Biomolecules

1) List out the 5 major elements found in living things:

C – _____

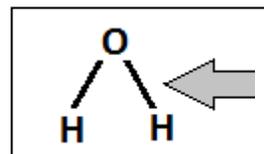
H – _____

O – _____

N – _____

P – _____

2) What is the significance of the line (indicated by the arrow) in the molecule to the right? _____



3) How many Hydrogen atoms are present in this molecule? _____

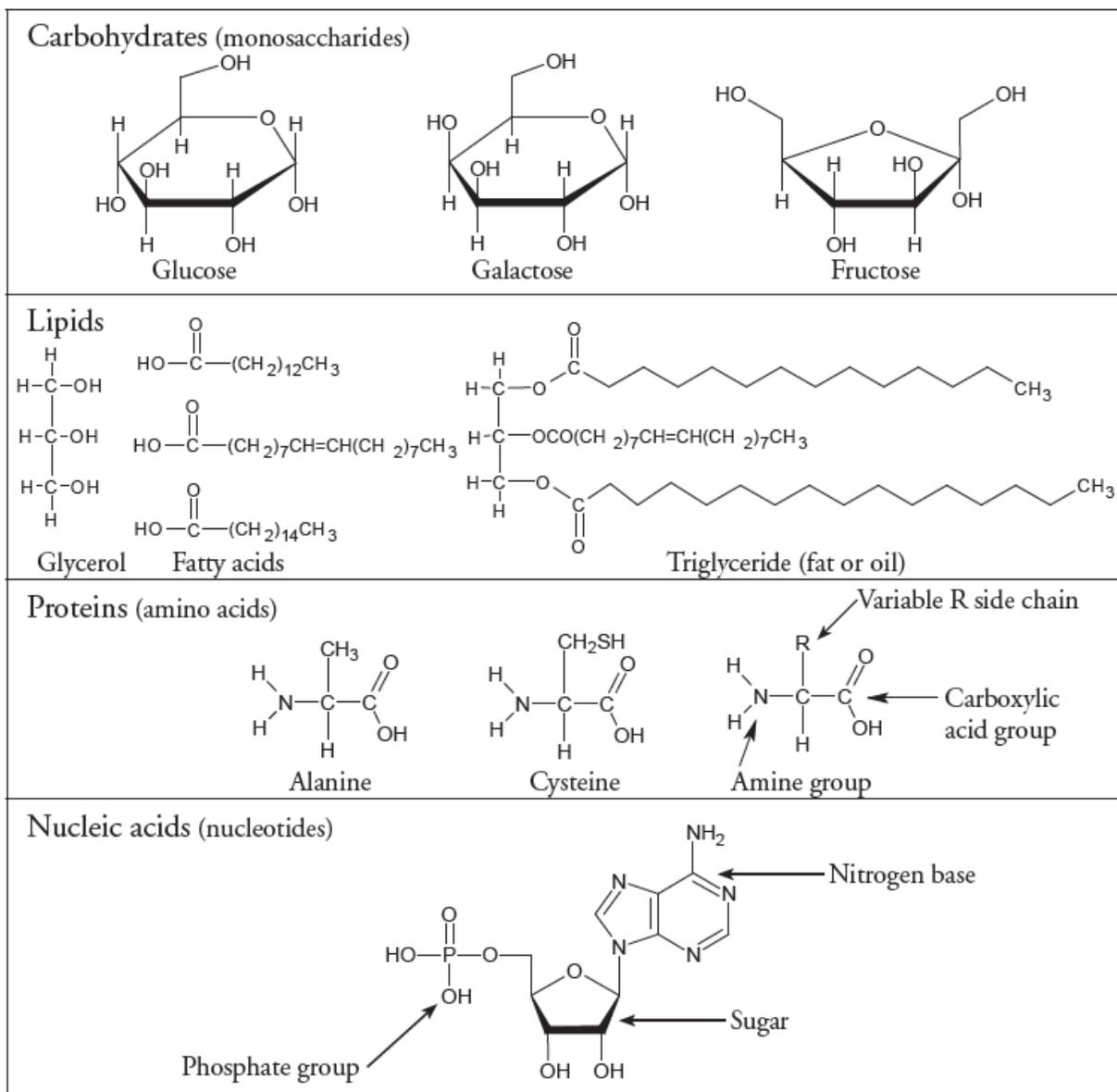
Model 1 – Molecular Drawings

<p style="text-align: center;">Lewis structure of glucose</p>	<p style="text-align: center;">Line drawing of glucose</p>
<p style="text-align: center;">Lewis structure of unsaturated fatty acid</p>	<p style="text-align: center;">Line drawing of unsaturated fatty acid</p>

4) What element(s) are being shown in the Lewis Structure of Glucose that are not shown in the Line drawing of glucose in the diagram above? _____

5) What element(s) are being shown in the Lewis Structure of unsaturated fatty acid that are not shown in the Line drawing of unsaturated fatty acid in the diagram above? _____

Model 2 – Molecules of Life



Read This!

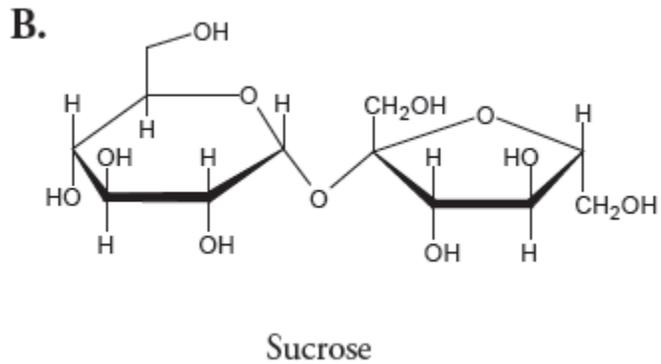
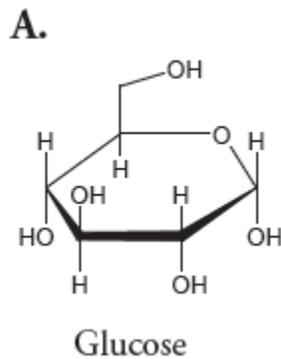
During chemical reactions, the bonds in molecules are continually broken and reformed. To break a bond, energy must be absorbed. When bonds are formed, energy is released. If more energy is released than absorbed during a chemical change, the process can be used as a source of energy. A general rule for processes such as respiration is the more carbon atoms there are in a molecule, the more energy that molecule can provide to the organism when it is used as food.

- 6) Using the information from above, is a carbohydrate or a lipid more likely to be a good source of energy for an organism?
- 7) Use Model 1 to show which atoms are present in each type of molecule by listing the symbol for each atom included. Carbohydrate has been done for you.
 - a. Carbohydrate— C, H, O
 - b. Lipid—
 - c. Amino acid —
 - d. Nucleic acid —

- 8) Which type of molecule includes an example with a long-chain carbon backbone?
- 9) In the molecule referred to in the previous question, what is the dominant element attached to the carbon backbone?
- 10) The fatty acid chain of the lipids is often referred to as a hydrocarbon chain. Discuss with your group why the chain is given this name and write a one-sentence definition for a hydrocarbon.

Hydrocarbon - _____

- 11) Which molecule(s) contain nitrogen?
- 12) Which molecule(s) contain phosphorus?
- 13) Which molecule has a sugar, nitrogenous base, and phosphate group?
- 14) Discuss with your group members some similarities among all four types of molecules. List as many as you can



- 15) Which diagram above best represents a disaccharide?