

Biological Macromolecule Advertising Poster Project

You and your table mates will be researching and creating an informational poster on one of four biological macromolecules: carbohydrates, lipids, proteins, or nucleic acids. You will have one day in class to research and one day in class to create the poster. During the course of your research you should answer all of the questions listed below. What you do not complete in class you will need to complete at home on your own. One poster board will be provided for your group as well as access to markers, colored pencils, rulers, and scissors – any additional items must be provided by you (additional items are not required for the successful completion of this assignment).

Textbook sources: Glencoe (zebra cover) – pages 166-171

At home you are encouraged to conduct additional research. Be sure to write down which websites you visited.

Biological Macromolecule: Carbohydrates

- Define the following terms:

- macromolecule:

- monomer:

- polymer:

- What elements do most carbohydrates contain?
- The elements found in carbohydrates occur in a specific ratio. Describe that ratio.
- The monomer of carbohydrates is called a(n)_____.
- The most common carbohydrate monomer is called glucose, and it has the molecular formula $C_6H_{12}O_6$. There are two other monomers that are isomers of glucose.
- Define the term isomer:

- What are the two isomers of glucose?

- Draw glucose below.

- If two carbohydrate monomers are bonded together, this molecule is called a(n) _____.

- There are three major types of this larger molecule. Fill in the blanks below to describe which monomers create the larger molecule.

- maltose = glucose + glucose

- lactose = _____ + _____

- sucrose = _____ + _____

- Draw sucrose below.

- If three or more carbohydrate monomers are bonded together, this larger molecule is called a(n) _____.

- There are two major functions of carbohydrates. In the space below list each function and give at least two examples of specific carbohydrates that do each job (one example from plants, one from animals).

- Function 1:

- Example from plants: _____

Describe it:

- Example from animals: _____

Describe it:

- Function 2:

- Example from plants: _____

Describe it:

- Example from animals: _____

Describe it:

Advertising Plans:

Macromolecule Advertising Slogan: _____

Poster Project Ideas and Design scteches:

Group Member names – No more than three people in a group	Hour

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Textbook sources: Glencoe (zebra cover) – pages 166-171 & 159-160

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Biological Macromolecule: Proteins

- Define the following terms:

- macromolecule:

- monomer:

- polymer:

- What elements do most proteins contain?

- The monomer of proteins is called a(n)

- Draw an example of the monomer below. Label the carboxyl group, amino group, and the R group.

- What is an R group?

- How many different types of monomers are there in humans?
- What makes one protein monomer different from another protein monomer?
- If two protein monomers are bonded together, this molecule is called a(n) _____ .
 - What type of bond holds this type of molecule together?
 - Draw an example of this type of molecule. Circle the bond holding them together
- If three or more protein monomers are bonded together, this larger molecule is called a(n) _____ .
- There are at least four major functions of proteins. In the space below list each function and an example of a type of protein that does each job.
- Function 1: _____
 Example: _____
 Describe it: _____
- Function 2: _____
 Example: _____
 Describe it: _____

- Function 3:

Example: _____

Describe it:

- Function 4: _____ speed up reactions _____

What is the name of a protein that speeds up chemical reactions?

What is the name of any substance that speeds up chemical reactions?

How do these proteins speed up chemical reactions?

What factors can affect the rate at which these proteins work?

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Biological Macromolecule: Lipids

- Define the following terms:
- macromolecule:

- monomer:

- polymer:

- What elements do most lipids contain?

- The monomer of most lipids is called a(n)

- The monomer of lipids has two specific ends: a hydrophobic end and a hydrophilic end. Define these two terms.

hydrophobic: _____

hydrophilic: _____

- There are 4 major types of complex lipids or lipid polymers.
- Triglycerides
 - Is it made of fatty acid monomers?
- There are two types of triglycerides: fats and oils. Compare the two types by completing the chart below.

	Fats	Oils
Type of fatty acid? unsaturated or saturated		
State at room temperature? liquid or solid		
Found in? plants or animals		

- What is the function of triglycerides?
- Phospholipids
 - Is it made of fatty acid monomers?
 - What cellular structure do phospholipids make?
 - What is the function of phospholipids?
- Draw a phospholipid. Label its hydrophobic end and hydrophilic end.
- Waxes
 - Is it made of fatty acid monomers?
 - What is the function of waxes?
 - Give at least two examples of organisms that use waxes and describe how each organism uses the wax.

- Steroids
 - Is it made of fatty acid monomers?
 - Describe the structure of steroids. Draw an example.

- What is(are) the function(s) of steroids?

- Give three examples of steroids found naturally in humans.

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Biological Macromolecule: Nucleic Acids

- Define the following terms:

- macromolecule:

- monomer:

- polymer:

- What elements do most nucleic acids contain?

- The monomer of nucleic acids is called a(n)

- All types of the nucleic acid monomer have the same basic structure. Draw it below and label the phosphate group, 5-carbon sugar, and the nitrogen base.

- There is a special kind of nucleic acid monomer called ATP (see page 221 in the Glencoe book).
 - What does ATP stand for?
 - How does this monomer differ from the ones described in question 4?
 - What is the function of this special monomer?
- What is the function of nucleic acids (the polymers especially)?

There are two types of nucleic acid polymers: DNA and RNA (Glencoe pages 329-331 and 336).

- DNA
 - What does DNA stand for?
 - What type of 5-carbon sugar is found in its monomers?
 - What types of nitrogen bases are found in its monomers?
 - How is its structure different than that of RNA?
 - Where is it found in human cells?
- RNA
 - What does RNA stand for?
 - What type of 5-carbon sugar is found in its monomers?
 - What types of nitrogen bases are found in its monomers?
 - How is its structure different than that of DNA?
 - Where is it found in human cells?

- Draw a picture of DNA below. Label a phosphate group, a 5-carbon sugar, the nitrogen bases, and the sugar-phosphate backbone.

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