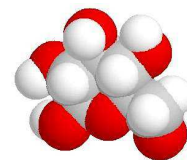


Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Macromolecules WebQuest



### Part 1: Macromolecules Tutorial

*Here you will click through a series of four tutorials about the four major types of macromolecules. Use the website listed below to answer the following questions.*

A. Open the website <http://bcs.whfreeman.com/thelifewire/content/chp03/0302002.html>

B. Start by reading the introduction.

1. What are the four main types of **macromolecules**?

\_\_\_\_\_

2. What is a **polymer**?

3. List the **monomers** that are linked together to form each of the following macromolecules:

Proteins \_\_\_\_\_

Carbohydrates \_\_\_\_\_

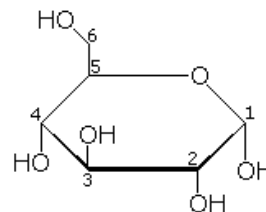
Nucleic acids \_\_\_\_\_

C. Click on the tab at the top of the page called Animations.

➤ Click the box labeled “step-through”

➤ Click on “CARBOHYDRATES” first.

➤ There are 6 separate pages for the carbohydrate module. After you read each page, click “continue”, and then “play” to watch the animation.



1. \_\_\_\_\_ is a hexose, a sugar composed of \_\_\_\_\_ carbon atoms, usually in \_\_\_\_\_ form.

2. How many **glucose monomers** are there in a single starch molecule? \_\_\_\_\_

3. Glucose molecules can be added to starch by a \_\_\_\_\_ reaction, where two molecules \_\_\_\_\_ bond together and release a \_\_\_\_\_ molecule.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

4. Which is more highly branched, **Amylose** (plant starch) or **Glycogen** (in animal livers and fat)?

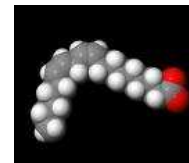
5. \_\_\_\_\_ are hydrolyzed (broken apart) to form glucose, and glucose is then further broken down to release \_\_\_\_\_.

#### D. Click on “Options”

➤ Click on “LIPIDS”.

➤ There are 7 separate pages for the lipid module. After you read each page, click “continue”, and then “play” to watch the animation.

1. What is a **triglyceride** composed of?



2. Why is **Palmitic acid** called a saturated fatty acid?

3. What makes **oleic acid** a monounsaturated fatty acid?

4. How many **double bonds** are there in a polyunsaturated fatty acid? \_\_\_\_\_

5. Why are **polyunsaturated fatty acids** often liquid at room temperature?

6. Compare the shape of the carbon chain in a saturated fatty acid, a monounsaturated fatty acid, and a polyunsaturated fatty acid. Draw a rough sketch of the three chains below.

Saturated

Monounsaturated

Polyunsaturated

#### E. Click on “Options” at the bottom of the page.

➤ Click on “Proteins”

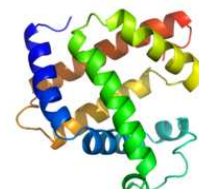
➤ There are 6 separate pages for the proteins module. After you read each page, click “continue”, and then “play” to watch the animation.

1. Proteins are chains of \_\_\_\_\_ linked by \_\_\_\_\_.

2. The 20 different amino acids used to make all proteins differ only in their \_\_\_\_\_.

3. A protein’s amino acid sequence determines its \_\_\_\_\_ and \_\_\_\_\_.

4. What is collagen?

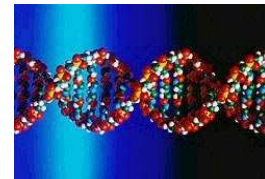


Name: \_\_\_\_\_

Date: \_\_\_\_\_

**F. Click on “Options” at the bottom of the page.**

- Click on “Nucleic Acids”
- There are 6 separate pages for the nucleic acids module. After you read each page, click “continue”, and then “play” to watch the animation.



1. What are the two types of nucleic acids?

\_\_\_\_\_ and \_\_\_\_\_

2. What do nucleic acids have the ability to do within the cell?

3. When two strands of DNA pair by hydrogen bonding, the base \_\_\_\_\_ always pairs with \_\_\_\_\_, and \_\_\_\_\_ always pairs with \_\_\_\_\_.

4. Draw a rough sketch of the three parts of a nucleotide below.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

5. In DNA, base pairing occurs only between a \_\_\_\_\_ and a \_\_\_\_\_.

6. Fill in the table below with the appropriate names of the nitrogen bases:

| DNA complimentary base pairs |            |
|------------------------------|------------|
| Purine                       | Pyrimidine |
|                              |            |
|                              |            |

**G. Click on the tab at the top of the page called Conclusion.**

- Read the conclusion.

1. A macromolecule’s structure is intimately connected to its \_\_\_\_\_.

2. List one function of each macromolecule below:

3

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Nucleic Acid \_\_\_\_\_

Carbohydrate \_\_\_\_\_

Protein \_\_\_\_\_

## **Part 2: Macromolecules in 3D**

*Here you will browse through several 3D images of different macromolecules. Study the images to find features that you learned about in the previous tutorial.*

**A. Visit the website <http://www.nyu.edu/pages/mathmol/library/life/>**

**B. Click on the link called Sugar Molecules**

- **Browse through the different 3D images of carbohydrate molecules.**
- **In order to view an image, always click on the small link Gif above the picture. DO NOT click VRML or PBD.**

**C. Click on the link called Lipids at the bottom of the screen.**

- **Browse through the different 3D images of lipid molecules.**
- **In order to view an image, always click on the small link Gif above the picture AND the small link Info above the picture to learn more about the molecule.**

1. Categorize the different lipid molecules as saturated, monounsaturated or polyunsaturated.

2. How could you tell from viewing the 3D images?

**D. Click on the link called Amino Acids at the bottom of the screen. These are the small building blocks of proteins!**

- **Browse through the different 3D images of amino acids.**
- **In order to view an image, always click on the small link Gif above the picture AND the small link Info above the picture to learn more about the molecule.**

**E. Click on the link called Nucleotides at the bottom of the screen.**

- **Browse through the different 3D images of Nucleotides and Nucleic acids. BE SURE TO CLICK ON THE DNA MOLECULE!**
- **In order to view an image, always click on the small link Gif above the picture AND the small link Info above the picture to learn more about the molecule.**

*Congratulations, you survived Macromolecules 101!*

