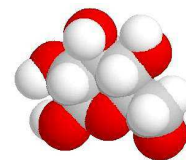


Name: _____

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 _____

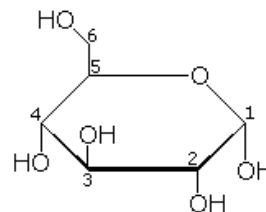
Nucleic acids _____

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: _____

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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”

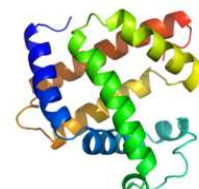
➤ There are 6 separate pages for the proteins module. After you read each page, click “continue”, and then “play” to watch the animation.

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?

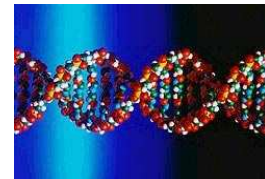


Name: _____

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!

