

AP Biology Summer HW Addition – SENIORS ONLY (estimated time – 90 minutes)

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Section 1 Update: Since you have already completed section I of your summer homework for me (your science autobiography), you are well on your way to being done with your summer HW. HOWEVER, you must update it, and I am particularly interested in hearing how your thoughts have changed over the last year taking biology as a junior.

Section 5: 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.

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?

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?

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.

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

Section 2- Biochemistry

Please watch the Khan Academy video on diffusion and osmosis (<https://www.khanacademy.org/science/biology/cell-division/v/diffusion-and-osmosis>). Feel free to create a Khan Academy account while you are here!

1. What is the difference between polar and non-polar?

2. Is water polar or non-polar? Why?

3. Would that make water a polar solvent, or a non-polar solvent? What about oil?

4. Do polar and non-polar substances mix? Why not?