

Macromolecules in Depth

Name: _____ Per: _____

Instructions: Print out this worksheet and answer the questions as you watch the videos located at the websites below. If you do not have a printer, you can write out the questions and answers on a separate sheet of paper.

Carbohydrates http://www.youtube.com/watch?v=zm_DyD6FJ0

1. What two functions do sugars have in our body?
2. What is the scientific name for a single sugar molecule?
3. What is the scientific name for two sugar molecules bonded together?
4. What is the scientific name for 3-10 sugar molecules bonded together?
5. What is the scientific name for more than 10 sugar molecules bonded together?
6. What is the ratio of Carbon to Hydrogen to Oxygen in all carbohydrates?
7. What parts of the glucose molecule cause it to be polar so that it is readily dissolvable in water?
8. What are the basic three monosaccharides? 1) _____ 2) _____ 3) _____
9. Draw a glucose molecule:

10. What enzyme breaks sucrose down into glucose and fructose?
11. What causes people to be lactose intolerant?
12. What is starch? Why do plants make starch?
13. What molecule do humans use instead of starch to store energy?
14. What is cellulose? Why can't we digest it?
15. We use a _____ reaction to join two sugars and a _____ reaction to break apart two sugars.

Lipids <http://www.youtube.com/watch?v=VGHD9e3yRIU>

1. What molecules make up triglycerides?
2. What enzymes break down lipids?
3. Phospholipids and cholesterol make up what part of cells?
4. What is a hydrocarbon?
5. How is energy stored in hydrocarbons?

6. Why are saturated fats solid at room temperature and unsaturated fats liquid at room temperature?
7. Which fats are most unhealthy?
8. What is Olestra?
9. What are phospholipids? Be specific. Describe their structure.
10. Which part of the phospholipid is polar? Which part is nonpolar?

Proteins

http://www.youtube.com/watch?v=2Jgb_DpaQhM

1. Proteins are made of _____ which we get from our _____.
2. Draw the R-group in each of the following:
 - Aspartic Acid:
 - Alanine:
 - Lysine:
 - Threonine:
3. Where does dehydration occur to form proteins in cells?
4. How do the characteristics of the R-groups of threonine and alanine differ from one another?
5. Why do aspartic acids in a protein fold next lysines?
6. At what point is a polypeptide referred to as a protein?
7. What is the primary structure of a protein?
8. What is the secondary structure of a protein?
9. What type of bond holds alpha helices together?
10. What is the tertiary structure of a protein?

3. In the cookbook analogy, what parts of the cell are analogous to each of the following:

The cookbook:

The copied recipe on the recipe card:

The cooks:

The ingredients:

4. Where does DNA stay locked away in eukaryotic cells?

5. What is a gene?

6. All life has _____ that was inherited ultimately from a common _____ that all living things on the planet share.

Mutations <http://www.youtube.com/watch?v=eDbK0cxKKsk>

1. Mutations are _____ in DNA.

2. DNA is _____ to make messenger RNA which is _____ to make a protein.

3. In the recipe analogy, what is a point mutation?

4. Why was the first mutation less harmful than the second mutation?

5. Compare and contrast the two causes of mutations:

6. What is benzo (a)pyrene? Where is it found and why is it harmful?

7. What is a substitution mutation?

8. Why does the cell only fix a substitution mutation 50% of the time?

9. What is an insertion mutation?

10. What is a deletion mutation?

11. Why do you think insertion and deletion mutations more harmful than substitution mutations?

12. What are the five types of chromosomal mutations?