

Name _____

Per. _____

**Biology Homework Chapter 4: Matter and Energy
in the Web of Life
Pages 85 - 111**

Answer the questions with complete thoughts!

* **Sections 4.3 through 4.4:** Read pages 85 to 88

PART A: Define the terms.

Element _____

Chemical reaction (rxn) _____

Catalyst _____

PART B: Answer the following questions.

1. What is the difference between an element and a molecule?

2. Draw a chemical equation showing a synthesis reaction. (Be sure to include **energy and an arrow** in the equation.)

3. Draw a chemical equation showing a decomposition reaction. (Be sure to include **energy and an arrow** in the equation.)

4. Explain why **water** dissolves so many substances. It is said to be the “universal solvent”. (see lecture notes for help)

PART C:

1. Read, study and know pages 85 - 88. Answer questions **4 through 6** in the **CONCEPT REVIEW on page 88**.

Answer the questions in complete intelligent answers in the space provided. Number your answers.

Possible Essay #1 for Exam 4: Your response should be in complete sentences!

1. Compare and contrast a synthesis reaction and a decomposition reaction. Be sure to mention energy's role in both reactions.

* **Sections 4.5 through 4.7:** Read pages 88 - 91

PART A: Define the terms.

Photosynthesis _____

Chloroplast _____

Chlorophyll _____

ATP _____

ADP _____

Cellular Respiration _____

PART B: Answer the following questions.

1. Write the *chemical equation* for **photosynthesis**.

2. *How* is the energy released from sugar (food) molecules when you eat them?

3. *What* is the energy releasing process used by organisms called?

4. Write the *chemical equation* for **cellular respiration**.

5. *What three products are released* when sugar (food) is broken down in living organisms?

6. *What are two differences* between how a **wood-burning fire releases energy** and the way your **cells release energy from food**? (see figure 4.8, page 90)

PART C:

1. Read, study and know pages 88 - 91. Answer questions **1 through 5** in the **CONCEPT REVIEW on page 91**. Answer the questions in complete intelligent answers in the space provided. Number your answers.

* **Sections 4.8 through 4.12:** Read pages 92 - 98

PART A: Define the terms.

Organic molecule _____

Polymer _____

Carbohydrate _____

Lipid _____

Nucleic Acid _____

Polypeptide _____

Calorie _____

PART B: Answer the following questions.

1. List the four major carbon-containing molecules found in all living things, and give the elements found in each molecule. e.g. C, H, O, N, S, P. (Note: one is done for you)

Carbohydrates; C₁ H₂ O₁

2. Using “squares and sticks” **draw and label** the following molecules in their space provided. **Label chemical bonds and their subunits (squares).**

a. monosaccharide



b. disaccharide

c. polysaccharide

3. Structurally, how are **starch and cellulose** different from **glucose**? (see figure 4.13 on page 93)

4. The sweetener *Equal* is advertised as having zero calories. Is it possible for Equal to have 0 calories? Explain your answer.

5. Using “squares and sticks” draw a **lipid molecule**. Be sure to **label the glycerol & fatty acids**.

6. Do carbohydrates or lipids store more energy for the cell? Explain.

7. Explain why diets high in saturated fats are **not** considered “heart smart”.

8. Using “squares and sticks” **draw and label** the following molecules in their space provided. **Label chemical bonds and their subunits (squares)**.

a. amino acid

b. dipeptide

c. polypeptide

9. List a food item that contains primarily the following nutrient:

Carbohydrate _____

Protein _____

Lipid _____

10. Using “squares and sticks” **draw and label** the following molecules in their space provided. **Label their subunits**.

a. DNA molecule (*show 2 nucleotide subunits minimum*)

b. RNA molecule (*show 2 nucleotide subunits minimum*)

