Name _____ Class _____ Date _____

2.3 Carbon Compounds

The Chemistry of Carbon

1. How many valence electrons does each carbon atom have?

_____

2. What gives carbon the ability to form chains that are almost unlimited in length?

_____

Macromolecules

For Questions 3–5, complete each statement by writing the correct word or words.

3. Many of the molecules in living cells are so large they are called _____.

4. _____ is the process that forms large organic molecules.

5. When two or more _____ join together, a polymer forms.

6. Create a table in which you compare the functions of the following macromolecules: carbohydrates, lipids, nucleic acids, and proteins**.**

Macromolecule	Function

2.4 Chemical Reactions and Enzymes

Chemical Reactions

1. What is a chemical reaction?

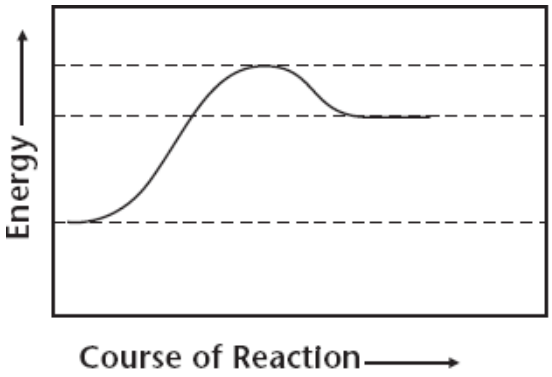
_____

2. Complete the table about chemicals in a chemical reaction.

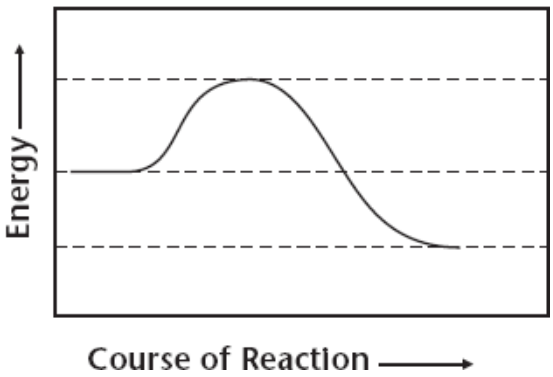
Chemicals in a Chemical Reaction	
Chemicals	**Definition**
Reactants	
Products	

Energy in Reactions

3. **THINK VISUALLY** The graphs below show the amount of energy present during two chemical reactions. One of the reactions is an energy-absorbing reaction, the other is an energy-releasing reaction. Label the type of reaction for each, label the energy level for the reactants and products, then draw an arrow on each to show the energy of activation.



Type of reaction: _____



Type of reaction: _____

4. What is released or absorbed whenever chemical bonds form or are broken?

_____

5. What is the energy of activation?

_____

6. Of the two reactions shown, which one is more likely to start spontaneously and why?

_____

_____

Enzymes

7. How does the addition of a catalyst affect the energy of activation of a chemical reaction?

_____

_____

8. What type of catalysts affect biochemical reactions?

_____

9. What makes proteins the ideal types of compounds to act as enzymes?

_____

_____

_____

For Questions 12–13, refer to the Visual Analogy comparing the action of enzymes to a lock and key.

12. **VISUAL ANALOGY** How is a substrate and its enzyme like a lock and its key?

_____

_____

_____