1. What is the Key Concept of section 2-4? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Main Idea: Bonds \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ during chemical reactions.

 1. Label the reactants and products in the chemical reactions shown below.

CH4 + 2O2

CO2 + 2H2O

6CO2 + 6H2O

6O2 + C6H12O6

Circle the word or phrase that best completes the sentence.

 2. During a chemical reaction, *chemical bonds* / *solutes* break and reform.

 3. *Reactants* / *products* are the substances changed during a chemical reaction.

 4. Bond energy is the amount of energy it takes to break a bond between two
*atoms* / *ions*.

 5. Equilibrium occurs when reactants and products are made at *the same rate* / *different rates*.

**MAIN IDEA:** Chemical reactions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy.

Choose whether the statement is true or false. IF the statement is false, correct it.

 \_\_\_\_\_\_\_\_6. *Not all* chemical reactions involve changes in energy.

 \_\_\_\_\_\_\_\_7. Activation energy is required for a chemical reaction to *start.*

 \_\_\_\_\_\_\_\_8. Some chemical reactions *release* more energy than they absorb, while others *absorb* more energy than they release.

 \_\_\_\_\_\_\_\_9. Chemical reactions can occur *whether or not* energy is added to the reactants.

 \_\_\_\_\_\_\_10. An exothermic chemical reaction *absorbs* more energy than it releases.

Vocabulary Check - Match the following vocabulary words with their corresponding definition.

1. Activation energy b. bond energy c. endothermic rxn d. equilibrium

e. exothermic reaction f. products g. reactants

\_\_\_\_\_\_11. substances changed during a chemical reaction

\_\_\_\_\_\_12. substances made by a chemical reaction

\_\_\_\_\_\_13. chemical reaction that releases more energy than it absorbs

\_\_\_\_\_\_14. chemical reaction that absorbs more energy than it releases

\_\_\_\_\_\_15. amount of energy that needs to be absorbed for a chemical reaction to start

\_\_\_\_\_\_16. amount of energy that will break a bond between two atoms

\_\_\_\_\_\_17. state reached when reactants and products are made at the same rate

18. How do endothermic and exothermic reactions differ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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19. Evaluate: Why might it not always be possible to determine the reactants and the products in a reaction? Explain your answer in terms of chemical equilibrium.

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20. Thinking Question: A chemical reaction can start when enough activation energy is added to the reactants. Do you think the activation energy for chemical reactions in living things is high or low? Explain your answer.

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**21.** Go to your online student edition of the text and go to “interactive review” and then on “self-checks”. Take the 2-4 Self-Check Quiz and record your score below. Write out the question AND answer to the ones you missed or the most difficult one.

\_\_\_\_\_\_\_ / \_\_\_\_\_\_