**Enzymes and Energy Quiz Study Guide** Pre-AP Biology 2013

1. Please fill in the blanks:

*An enzyme is usually a(n) that the rate of*

***BIOMOLECULE INCREASES/DECREASES***

*chemical reactions by lowering the .* ***TYPE OF ENERGY***

1. Define **reactant** and **product**. Using the space below, show the general formula for a chemical reaction, using these **2** terms.

1. Differentiate between an **endergonic** and **exergonic** reaction. Use the Venn diagram below to do so.

 **ENDERGONIC** **EXERGONIC**

1. Write down the formula for **photosynthesis**:

Circle the reactants and underline the products.

Is this reaction **ENDERGONIC** or **EXERGONIC**? *Circle one.*

1. Write down the formula for **cellular respiration**:

Circle the reactants and underline the products.

Is this reaction **ENDERGONIC** or **EXERGONIC**? *Circle one.*

1. List **5** factors that can stop or slow down enzyme activity in living cells.
2. List **2** ways that enzyme activity may be increased in living cells.
3. If the substrate concentration within a cell is doubled, what will happen to individual enzyme speed (rate of products produced by the enzyme) over time?
4. Define **activation energy**:
5. What is a **catalyst**?
6. Explain how activation energy relates to enzyme activity. *(i. e., what do enzymes do to this activation energy?)*



1. Define **active site** and label it on the diagram to the right. In addition,

label the **substrate** and **enzyme**.

1. Define **substrate**:
2. How can heat denature an enzyme?

List **2** additional factors that may denature enzymes.

1. Fill in the table below, summarizing the classroom demonstrations we have completed thus far:

|  |  |  |  |
| --- | --- | --- | --- |
| **Material studied/demo done** | **Substrate** | **Enzyme** | **Cells that contain the enzyme** |
| Jello soup |  | gelitanase/protease |  |
| Stomach this | Egg white protein |  |  |

1. Explain why Jello made with fresh pineapple is soupy but Jello made with canned pineapple is solid.
2. Diagram a molecule of **ATP** below. Circle the location(s) of energy storage within the molecule.

How is the stored potential energy within this molecule released?

1. What is the purpose of ATP?
2. What three letters do enzymes typically END with? (suffix)

Study the graph below and answer the following questions.

 Talleyase **Robertsase**

0 20 40 60 80 100 120 140 160 180 200 220 240

1. Provide an acceptable TITLE for this graph:
2. At what temperature does **Talleyase** work best?
3. At what temperature does **Robertsase** work best?
4. Which enzyme functions over the longest range of temperatures:

Which enzyme achieves the highest rate of chemical reaction:

1. Circle the temperature at which both enzymes work the best: 80 100 120 140 160 200
2. Circle the temperature at which NEITHER enzyme would work: 80 100 120 140 160 200
3. Label the graphs below as **endergonic** or **exergonic.**

