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Topic: Enzyme Worksheet

Summary: Students will be introduced to the enzyme-substrate system, activation energy, and how temperature affects enzyme activity.

NGSS Standards: *HS-LS1-3. Homeostasis and enzymes*. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

Time Length: 30 minutes

Materials:
Class notes or textbook or online textbook

- https://flexbooks.ck12.org/cbook/ck-12-biology-flexbook-2.0/section/1.17/primary/lesson/enzymes-bio/
- https://flexbooks.ck12.org/cbook/ck-12-biology-flexbook-2.0/section/1.18/primary/lesson/enzyme-function-bio/

Procedures:
1. Tell the students which section they are to use in the textbook or their associated lecture notes. Students are then going to read the section and answer the questions on the worksheet.

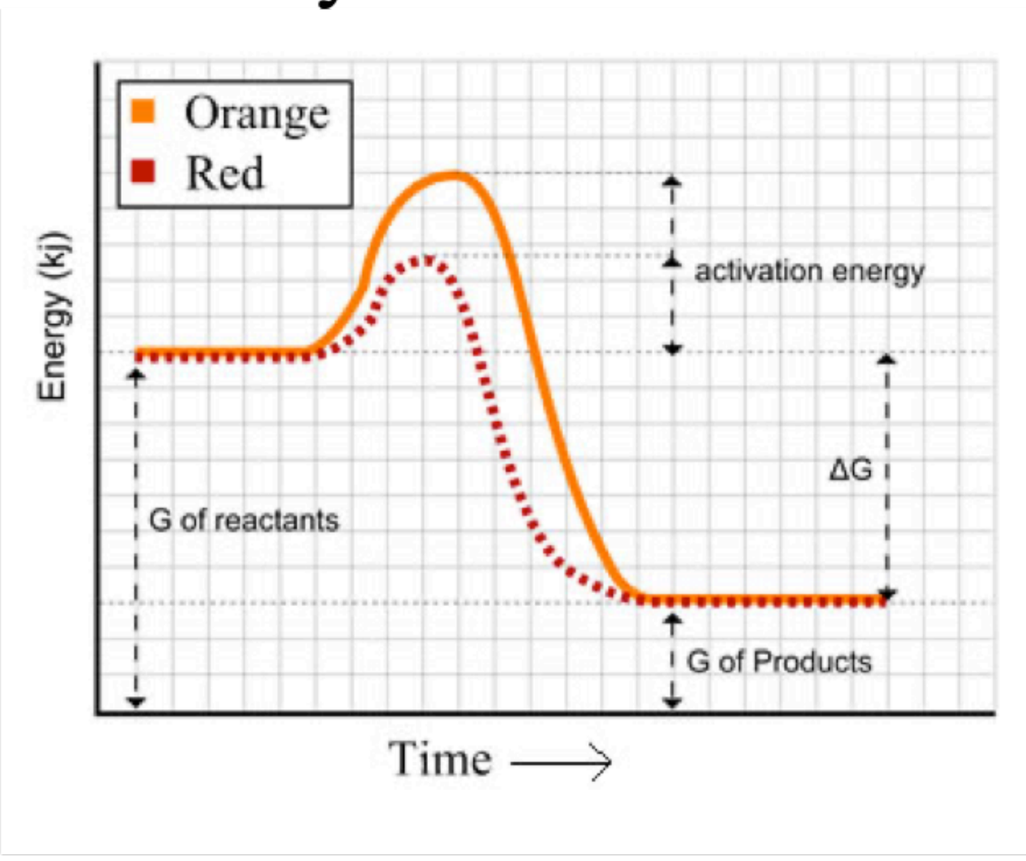
Accommodations: Allow students with an IEP modification to skip the reasoning questions (4, 6, 11, 13, 15). Students with an IEP can take the handout home if they need extra time.

Editable DOCX File and Answer Key:
Available at www.ngsslifescience.com

Name: _____ Row: _____

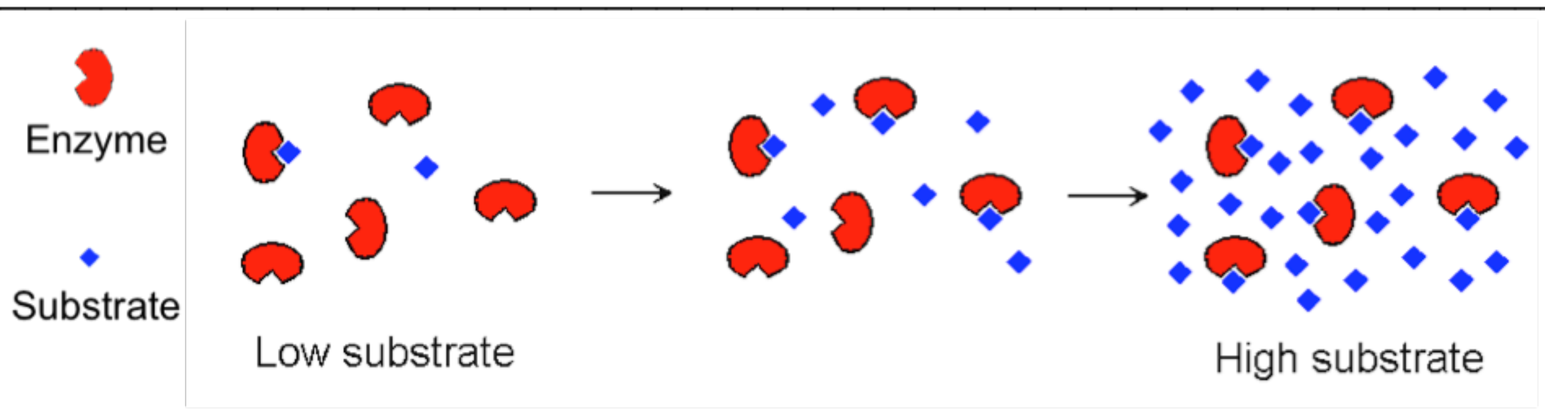
Date:_____ Period:_____

Enzyme Worksheet



1. Use the graph above for hints on how to answer questions 1-6. In order for a chemical reaction to take place, _____ energy is required.
2. The main purpose of an enzyme is to reduce the _____ energy of a chemical reaction.
3. *Circle your answer.* The dotted red line or the solid orange line represents a chemical reaction **without an enzyme**.
4. Explain your reasoning on how you came to answer question #3. _____

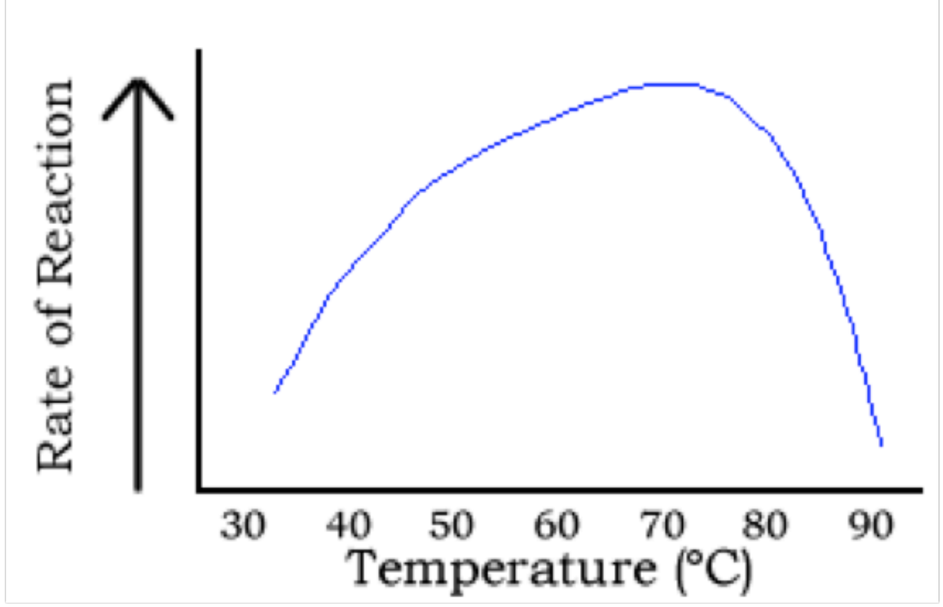
   _____
5. *Circle your answer.* The dotted red line or the solid orange line represents a chemical reaction **with an enzyme**.
6. Explain your reasoning on how you came to answer question #5. _____



7. *Circle your answer.* Use the diagram above to answer questions 7-11. Pretend the substrate represents food. In the low substrate environment, the enzyme could break apart 100 substrates quickly or slowly.

8. *Circle your answer.* In the medium substrate environment, the enzyme could break apart 100 substrates quickly or slowly.
9. *Circle your answer.* In the high substrate environment, would the enzymes work faster or slower or at the same speed as the medium substrate environment to break apart 100 substrates.
10. *Circle your answer.* If the substrate totally changed shape, would the same enzyme be able to break apart 100 substrates? Yes or No.
11. Explain your reasoning supporting your answer in question 10. _____

_____



12. In the graph above, at what temperature would the enzyme have the highest rate of reaction? _____
13. Explain what does it mean for the enzyme to have a high rate of reaction? _____

_____

14. *Circle your answer.* Does temperature affect enzyme activity? Yes or No.
15. Explain your reasoning supporting your answer in question 14. _____

_____

16. What type of macromolecule are enzymes? _____