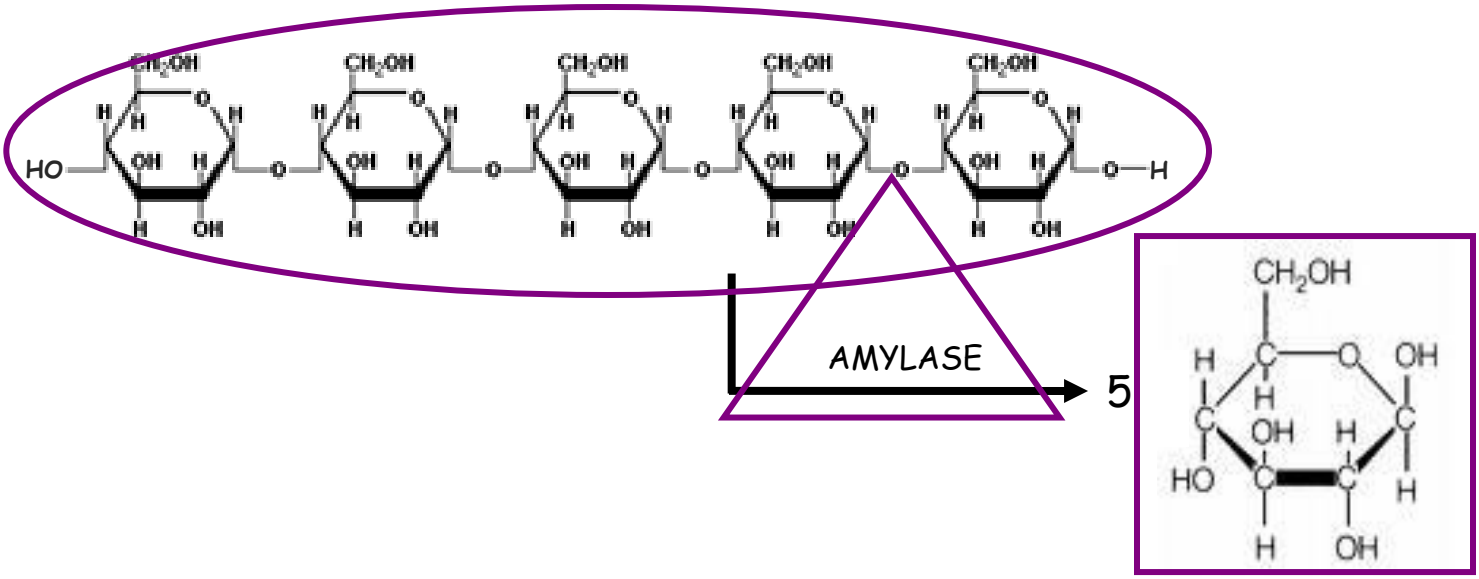
1C Mastery Quiz: ENZYMES **KEY**



This above is an example of a _____ reaction:

1. Dehydration Synthesis (or) **Hydrolysis** **(circle one)**
2. Endothermic (or) **Exothermic** **(circle one)**

For the reaction shown above:

3. Draw a circle around the **substrate**.
4. Draw a rectangle around the **product**.
5. Draw a triangle around the **enzyme**.

For the reaction shown above, provide the specific NAME of the substrate, enzyme, and product. (Good Review for the unit exam)

6. Substrate: __ **Glycogen, Polysaccharide or Starch**_____
7. Enzyme: _____ **AMYLASE**_____
8. Product: _____ **Monosaccharide, GLUCOSE**_____

9. In the space below, describe specifically what is happening in the reaction shown above.

A polysaccharide is being broken down into five monosaccharides.

10. In the space below, identify one general factor which could limit the effectiveness of the enzyme in the reaction shown on the previous page. Furthermore, you must **explain why** this factor would inhibit the function of the enzyme.

An increase in body temperature could denature the enzyme and cause amylase to unfold out of its normal three dimensional shape. If amylase loses its normal three dimensional shape, its binding sites will be less effective at attracting the polysaccharide substrates. If the enzyme can't consistently bind polysaccharides, then you won't create as much monosaccharide product.

An extremely acidic or extremely basic pH could also limit the effectiveness of the amylase enzyme for the same reasons mentioned above.

11. What is **denaturation**? Specifically describe what effect denaturation has on an enzyme.

Denaturation is when an enzyme unfolds out of its normal three dimensional shape. When an enzyme unfolds out of its normal shape, it will not be able to bind substrate as effectively. If an enzyme can't bind substrate, then you won't get as much product. Denaturation is caused by significant changes to the environmental temperature or pH at which the enzyme normally functions.

12. In the chemical reaction on the first page, would you categorize the enzyme as a **substrate, product,** or **neither**? **EXPLAIN WHY.**

Neither. Enzymes are not changed during a chemical reaction. Therefore, enzymes cannot be categorized as a substrate or product.

13. What is an exergonic (exothermic) reaction?? Explain the effect an enzyme may have on this reaction. You must DISCUSS ENERGY in your answer and you must also SKETCH A GRAPH to support your answer.

It is a reaction that releases energy by breaking bonds in a molecule. An enzyme will lower the activation energy normally required for the reaction to occur by providing a mechanism (or location) that allows the bonds to form more quickly and efficiently than simply random chance.