Honors Biology Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
NDHS Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Enzymes and Metabolism**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: sum of all chemical reactions in a cell

Parts of a Chemical Reaction:

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** 🡪 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Examples: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Two types of Metabolism:**

**\_\_\_\_\_\_\_\_\_\_\_\_\_**: Reactions that

Called  Reactions

Example:

: Reactions that

Called  Reactions

Example:  **=**

All Chemical Reactions Need  to start =

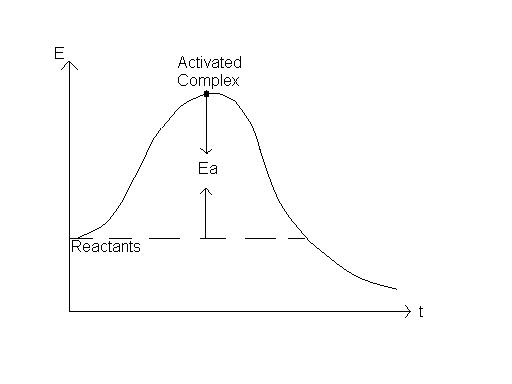
Reactions that have enough energy to start at room temperature are called

Reactions that don’t have enough energy to start at room temperature are call  **.**

**Energy Profile of a Chemical Reaction**Key: E = amount of Energy  
 t = time  
 Ea = Activation Energy

**Exothermic Reaction:**

The products have  than the reactants =

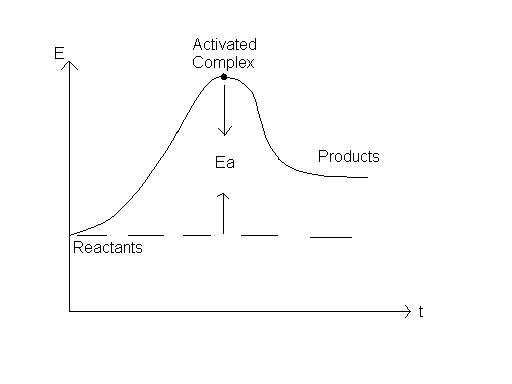


Change in Energy

Products

**Endothermic Reaction:**

The products have  than the reactants = energy is



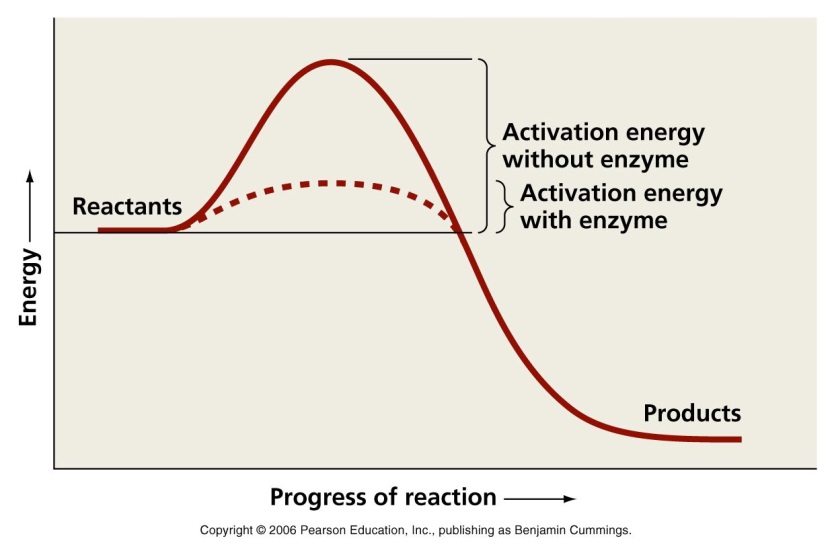
Change in Energy

**Role of Enzymes:**

Enzymes are .

Enzymes Lower the

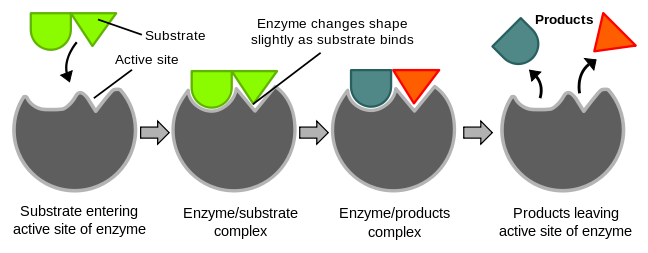
* Give a  for reactions
* Reactions happen

[](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=uAy8xLum_EVCKM&tbnid=Gn8TmdNuJEv_wM:&ved=0CAUQjRw&url=http://academic.pgcc.edu/~kroberts/Lecture/Chapter%205/enzymes.html&ei=KeRJUsWWA47e8ATG1oD4DQ&bvm=bv.53217764,d.eWU&psig=AFQjCNE_tYeqEEx4sR4OoiX8rTyU_mGc7A&ust=1380660618729472)

Enzymes are  structures that bind to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and cause them to .

Substrates fit  into the  of the enzyme called the  and cause the enzyme to  – called a  **.**

EX: Putting your hand in a glove.

The enzyme-substrate complex (when the two are bound together) create a  that allows the reaction to happen faster. [](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=jt6YIsRAJ8_0cM&tbnid=ZhDNBkKMBartMM:&ved=0CAUQjRw&url=http://en.wikipedia.org/wiki/Enzyme&ei=_edJUtnVAoX48wT30IHwDQ&bvm=bv.53217764,d.eWU&psig=AFQjCNFrg1b4srbcrdgoiJskKO5by8E58w&ust=1380661455508084)

**Factors that Affect Enzymes:**1) :

Increase in temperature  a reaction because it provides more energy and makes the molecules collide faster.  
 HOWEVER, if the temperature

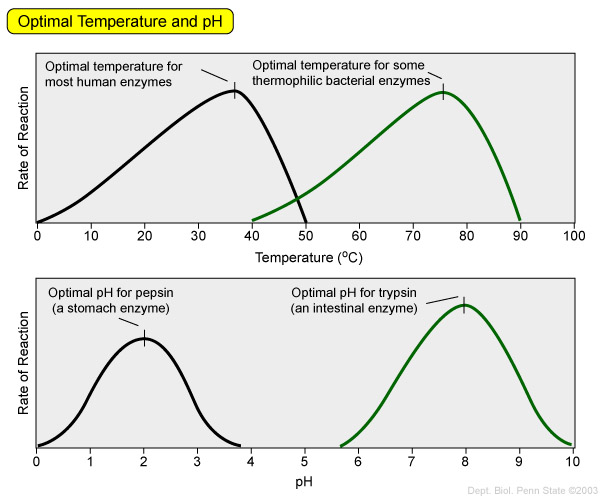
: to  the chemical structure of a molecule –

Ex: Cooking an egg, having a fever

2)  – all enzymes work best at a specific pH –

Most work best between  .

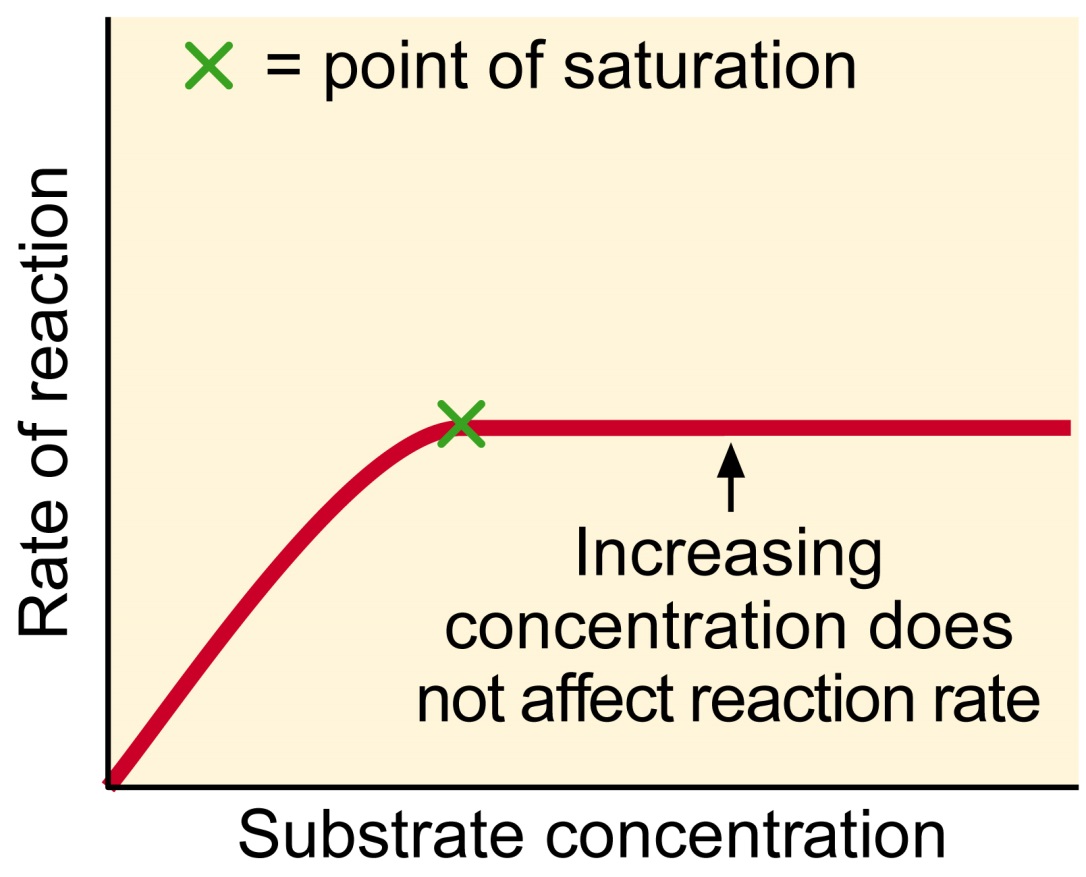
Some work better in acidic conditions and some in basic.

If the pH is  the enzyme will  and stop working.[](https://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=4bZimrZy59TTiM&tbnid=XG8VO-c6p-wIgM:&ved=0CAUQjRw&url=https://wikispaces.psu.edu/pages/viewpage.action?pageId%3D112527060%26navigatingVersions%3Dtrue&ei=2uVJUsfBDJPA9QS_hYGQDQ&bvm=bv.53217764,d.eWU&psig=AFQjCNHJFuccNWrlV7eL1ztubt9x4AlvzA&ust=1380661074034817)

3)

If you have  and you , the reaction will go .

If you have  and increase the amount of , the reaction will go  until you reach the point of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and the enzymes are working at  **\_\_\_\_**. Adding more substrate will not make the reaction go any faster.

[](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=zqMgG2dJ-JFwYM&tbnid=COV30s2HMjOBgM:&ved=0CAUQjRw&url=http://www.rsc.org/Education/Teachers/Resources/cfb/enzymes.htm&ei=PeZJUt72EJDo8wSm9YGYBQ&bvm=bv.53217764,d.eWU&psig=AFQjCNGSxDb8e36ZMXN3SpR4MgYrgkIULA&ust=1380661166593839)

4)

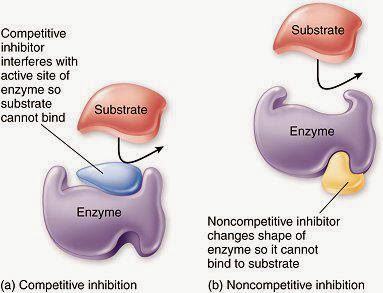
Substances that  to enzymes and  Co-factor =    
 Ex:  in hemoglobin  
  in DNA polymerase (builds new DNA)  
 Co-enzyme =    
 Ex: Riboflavin (B2) and Niacin (B3) for components in cellular respiration =

5) **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: Substances that bind to the enzyme and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

**Types**:

1) **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: Bind to the **\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

2) **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: Bind to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the enzyme **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (change in shape) so the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

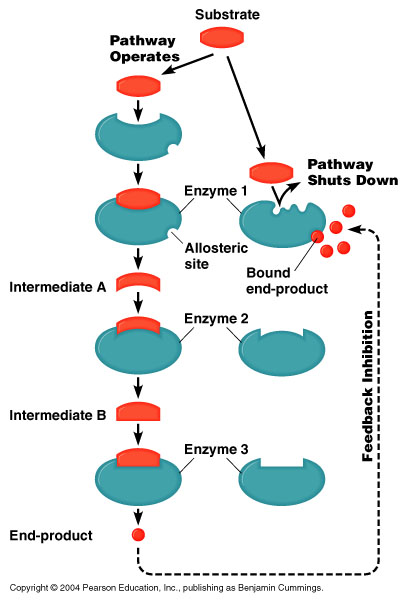
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6)

Some enzymes and metabolic pathways (a series of several enzymatic reactions) are  **.**

When , excess product

This keeps the cell from making too much of one product and

[](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=EMERxzUAFBQhEM&tbnid=6944bWPI7rJfyM:&ved=0CAUQjRw&url=http://classes.midlandstech.com/carterp/Courses/bio225/chap05/ss2.htm&ei=4OpJUu_XMYXE9gTz9oCgCw&psig=AFQjCNFrg1b4srbcrdgoiJskKO5by8E58w&ust=1380661455508084)

**ARE ENZYMES IMPORTANT?   
!!!!!YES!!!!!**

They control  that happens inside your cells.

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