

**Notes Organizer for Power Point Presentation *Proteins and Enzymes***

**Honors and STEM**

**Proteins have a wide variety of uses:**

* Structure (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
* Muscle \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (muscle fiber structures)
* Transportation (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ carries \_\_\_)
* Immunity (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
* Carrying out chemical reactions (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_… more to come!)

**Proteins are made of:**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* And sometimes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Proteins have monomers too…**

*Remember:*

*Carbohydrates are made up of monosaccharides*

*Nucleic Acids are made up of nucleotides.*

* Proteins are made of \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Amino Acids**

There are \_\_\_\_\_ amino acids.

Each amino acid is unique, just like the letters in the alphabet are unique.

The \_\_\_\_\_\_\_\_\_\_\_ of amino acids in the proteins determines what that protein will do.

Draw an Amino Acid. Use “R” to denote where each amino acid would be different.

Amino Acids are strung together using a chemical reaction known as a “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”

One amino acid loses a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The other amino acid loses a hydrogen and an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2 H + 1 O = water (H2O)

* Amino acids joined by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ bond form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ chain.
* Amino acids interact, and this determines the \_\_\_\_\_\_\_\_\_\_ of the protein.   
  This can vary *greatly.*  
  \_\_\_\_\_\_\_\_\_\_ varies, too, depending on the \_\_\_\_\_\_\_\_\_\_\_ of the amino acid chain!

**The shape of the protein allows the protein to perform certain functions.**

If the shape of the protein changes, the protein can no longer do its job.

**Protein Structure:**

* ­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Structure: sequence of amino acids
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Structure: Coils or folds in the polypeptide chain
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Structure: Results from interactions between the “R” groups
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Structure: Overall structure resulting from a protein that is made up of 2 or more chains

**A very special type of protein… Enzymes:**

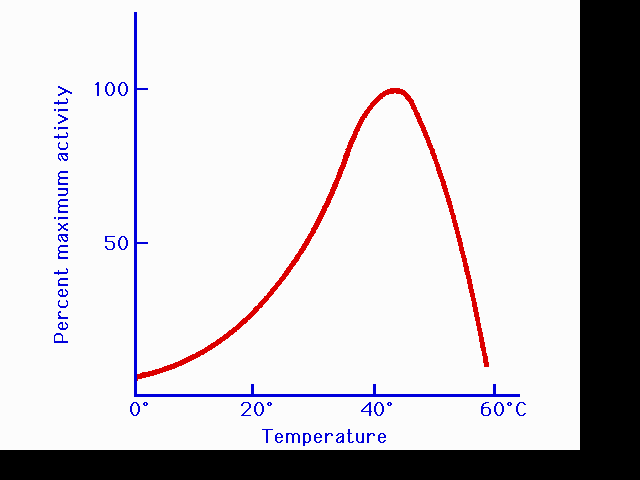
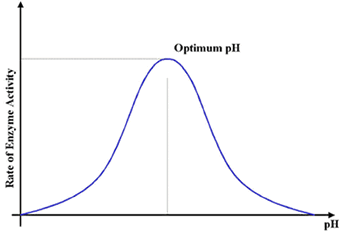
Are used to change how \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a chemical reaction will happen

This is why they are called “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”.

Enzymes fit their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ like a lock fits a \_\_\_\_\_\_\_\_\_\_\_\_\_.

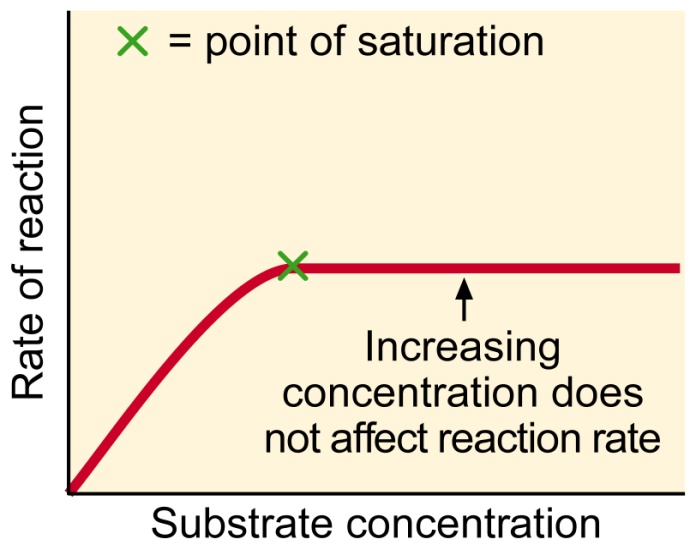
**Enzymes work at different rates depending on**

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the substrate
  4. environmental factors.

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**Enzymes will work faster if there is more substrate to work on until….**

* There is so much \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that there is not enough enzyme to work.
* And vice versa.



* More enzymes work faster until they \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ of substrate.
* Enzymes are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!
* When an enzyme is done with one piece of substrate, it moves on to the next one…
* And the next one… And the next one… Until the job is done.