

## Genetics and Heredity Review

### FINAL NOTES FOR TEST!!!

Feb 3-8:54 AM

**Chromosome** - a long thread-like structure found in pairs inside the nucleus of most cells. These are made up of DNA and they tell the cell what they are and what to do.

**Gene** - a segment of a chromosome (DNA) that codes for a trait.

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Chromosomes are found in the NUCLEUS of BOTH plants and animal cells!

**DNA** - is made up of nucleotides and is responsible for the genetic coding of an organism's traits.

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#### **DNA:**

**Uprights** (sides) - alternating sugar and phosphate

**Rungs** (steps) - nitrogen base pairs

**Nitrogen Base Pairs**: A with T and T with A, C with G and G with C.

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**James Watson and Francis Crick** were awarded the Nobel Prize for finding the structure of DNA.

**Double Helix** - twisted ladder like structure

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**Mutation** - occurs when there is a change in DNA. Change could be the structure of DNA or the number of chromosomes. Most mutations go unnoticed and are NOT harmful.

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**DNA Replication:** The process of copying the DNA so an organism has two identical strands of DNA. Once it has two copies it can divide into two new cells.

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**Asexual Reproduction:** When an organism can grow its own offspring without needing a mate/other organism. Only one parent!

**Sexual Reproduction:** When two organisms combine half sets of chromosomes (half of their genes) to produce and offspring with a blend of the parents traits.

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**Asexual Reproduction** is faster, more offspring and less variety. Good for population increase, bad because if something can harm one it can harm ALL of them.

**Sexual Reproduction** is slower, less offspring and more variety. Good to have variety so they are not all impacted by certain illness, but bad for population growth.

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**Genetic Diversity** increases with sexual reproduction! This means the genes are all random combinations in similar organisms. Like humans we all look a little different.

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Gregor Mendel:

- monk who studied pea plants
- found patterns in heredity (dominate and recessive traits.)
- called the "Father of Genetics"

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**Selective Breeding:** choosing certain organisms to reproduce with one another in order to pass on specific desirable traits to their offspring.

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Green Eyes in cats is dominant

Yellow Eyes in cats is recessive

Cross a hybrid Green Eyed cat with a Yellow Eyed cat.

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Trait - eye color

Alleles - green and yellow

Parent's Genotypes: Gg and gg

Phenotypes of offspring: green and yellow

Genotypes of offspring: Gg and gg

	G	g
G	Gg	gg
g	Gg	gg

% chance of getting kittens with yellow eyes: 50%

% chance of purebred Green eyes: 0%

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**Proteins** are made by ribosomes.

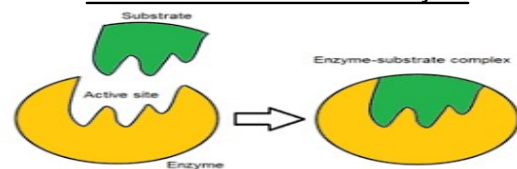
These **Proteins** are **enzymes** and combine in strands of DNA (found in the nucleus of the **cell**).

How they assemble in the **DNA** give "codes" to the **cell**. Telling it what type of **cell** it is, how it looks, and what it does.

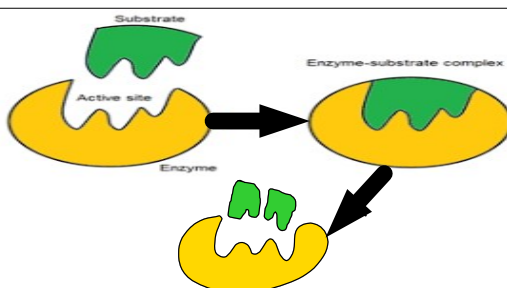
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**Enzymes:** Special types of proteins

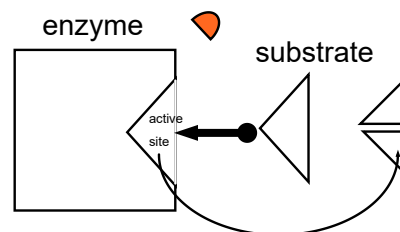
**Active Site:** Location on an **enzyme** where the **substrate** binds to the **enzyme**.



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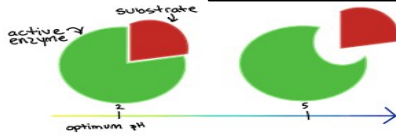
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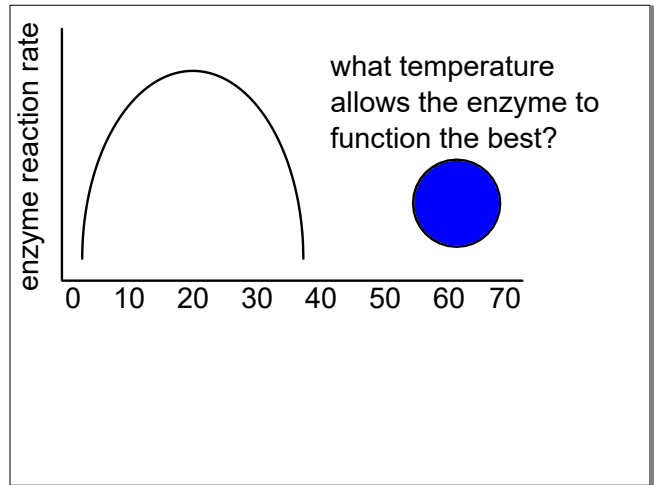
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**Enzymes** change the rate/speed of a chemical reaction.

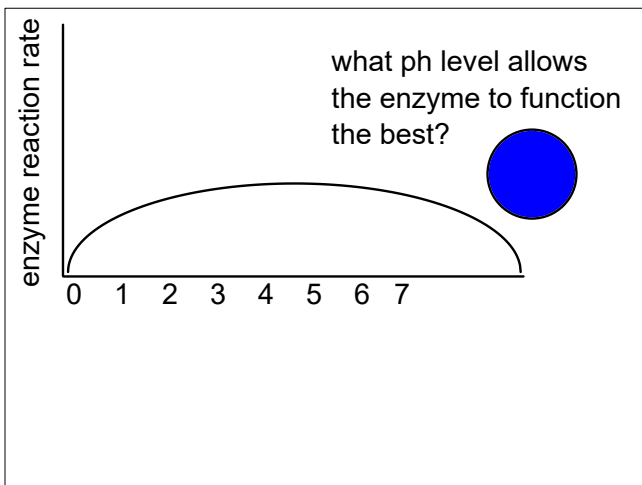
**Denatured Enzyme:** When environmental factors change the enzyme's active site (distorts it) and the substrate no longer fits.



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Meat tenderizer is an enzyme that breaks down the meat making it more tender. It works best at room temp. If you put it on meat and then place the meat into the refrigerator how would this affect the enzyme?

It would break the meat down slower due to not being at the best temp.

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## Enzymes in DNA

<https://www.youtube.com/watch?v=Qgc6hU-os8>

Feb 10-7:44 AM