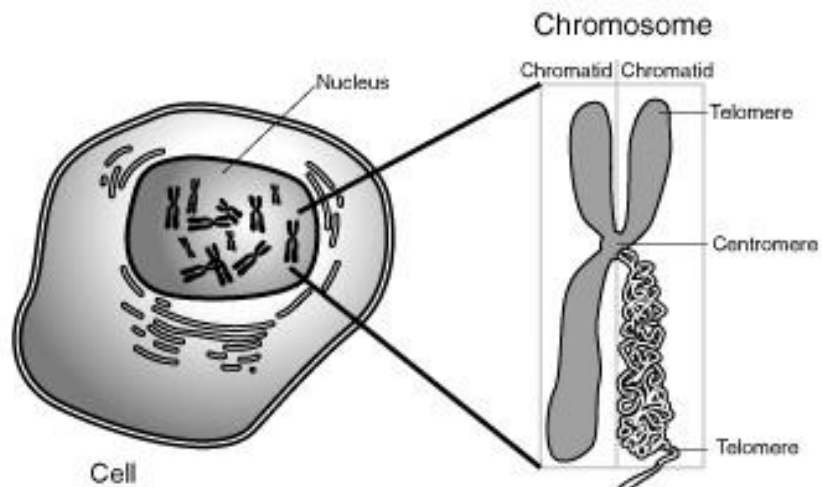


# TOPIC 2: HEREDITY AND GENETICS

11. Heredity - is the passing of genetic information from one generation to the next through reproduction.
12. The hereditary information (**DNA**) is organized in the form of genes located on chromosomes in the nucleus of each cell.

## Organization of the Nucleus:

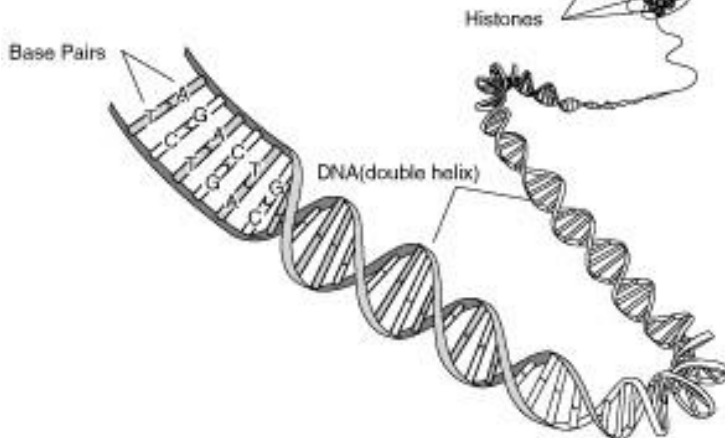
[smallest] Nucleotide → DNA → Gene → Chromosomes → Nucleus [biggest]



Base Pair Rule:

All - Teachers

Go - Crazy  
(this time of year)



13. Differences between asexual and sexual reproduction:

<i>Asexual Reproduction</i>	<i>Sexual Reproduction</i>
ONE parent or cell.	TWO parents or cells.
Offspring genetically IDENTICAL	Offspring genetically DIFFERENT
	Involves meiosis and fertilization.

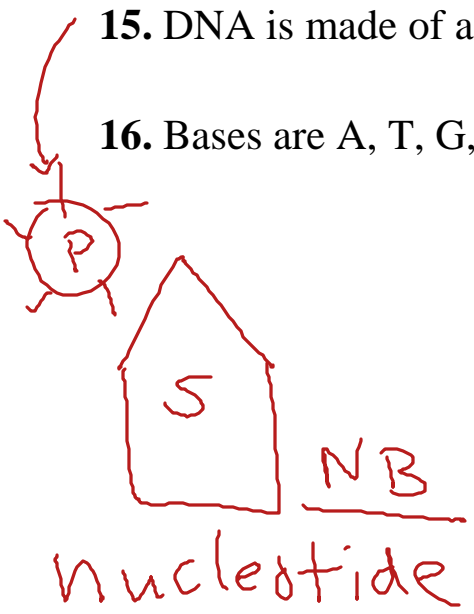
14. Clones - organisms with identical genetic copies.

15. DNA is made of a sugar, a phosphate and a base

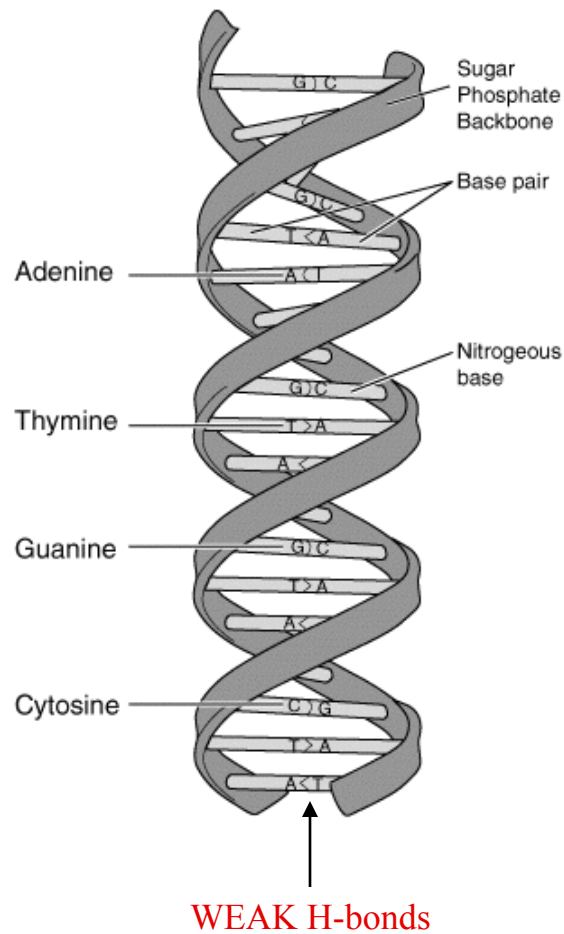
16. Bases are A, T, G, C A PAIRS WITH T

G PAIRS WITH C

**All Teachers  
Go Crazy**



*Double Helix Structure of DNA*

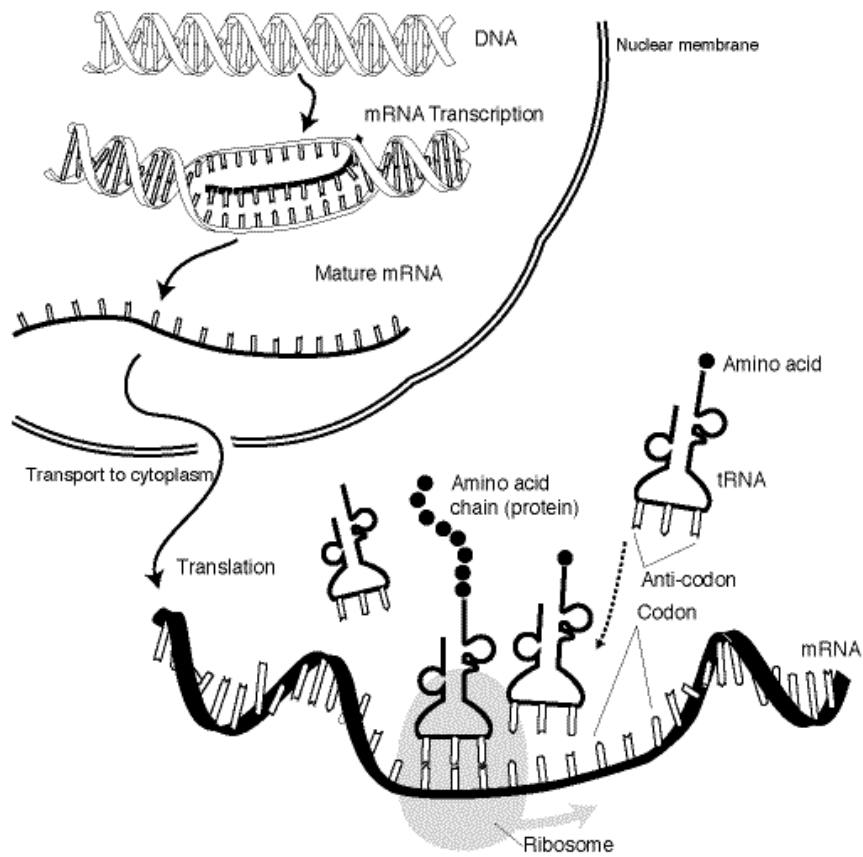


17. How does DNA make a protein?

DNA is stuck inside the NUCLEUS, so it send mRNA to the RIBOSOME where the message is read and used to direct the tRNA's to bring in the right AMINO ACIDS to the RIBOSOME to make a PROTEIN.

DNA -----> mRNA -----> protein

**Protein Synthesis:**



18.     **Mutations**     - any *alteration* or CHANGE in DNA

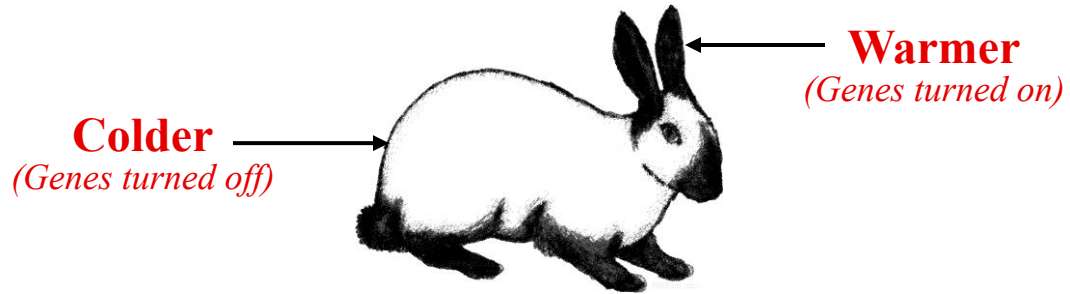
(a)     **Substitution**     - when one base is put in the place of another

(b)     **Deletions**     - when one base(s) is left out

(c)     **Addition**     - when one base is added.

(d)     **-----**     - when bases are inserted

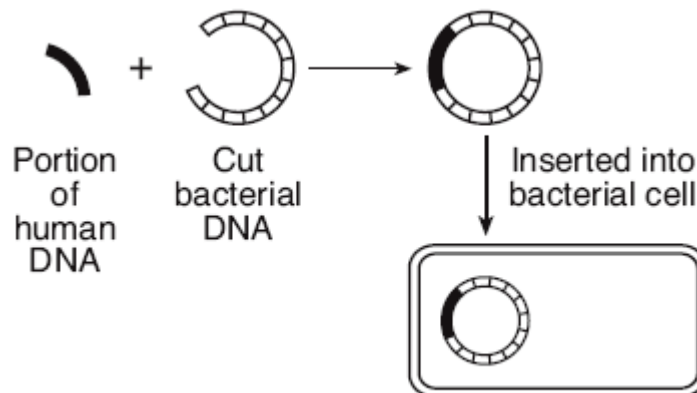
19. An organism's environment (*temperature*) can affect the way some genes are *expressed*. Example: Himalayan Rabbit



20. Genetic Engineering - is a technology that humans use to alter the genetic instructions in organisms.

21. Gene Splicing (*Recombinant DNA*) - cutting DNA from one organism and placing it into another.

Example: Insulin - putting the genes for insulin into bacteria so the bacteria can produce human **insulin** for **diabetics**



22. Selective Breeding - a process that produces domestic animals and new varieties of plants with traits that are desirable.

23. Species - is a group of closely related organisms that share certain characteristics and **can produce new individuals via reproduction.**

24. Cancer - uncontrolled cell division (MITOSIS).  
- can result from certain genetic mutations