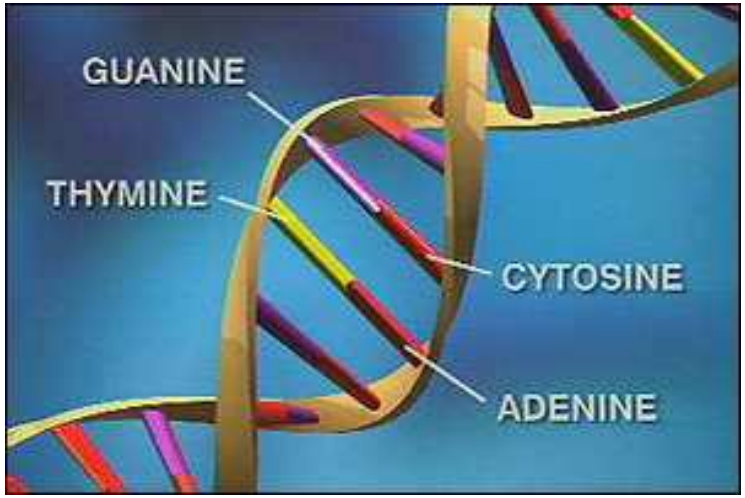
Genetic Variation

How we get change

- We said that Evolution was the change in allele frequency, but how do these alleles get changed?
- There are 3 main ways
  - Mutation
  - Migration
  - Sexual Reproduction

Mutation

- Mutations are changes in the DNA.
- An organism's DNA affects how it looks, how it behaves, and its physiology—all aspects of its life



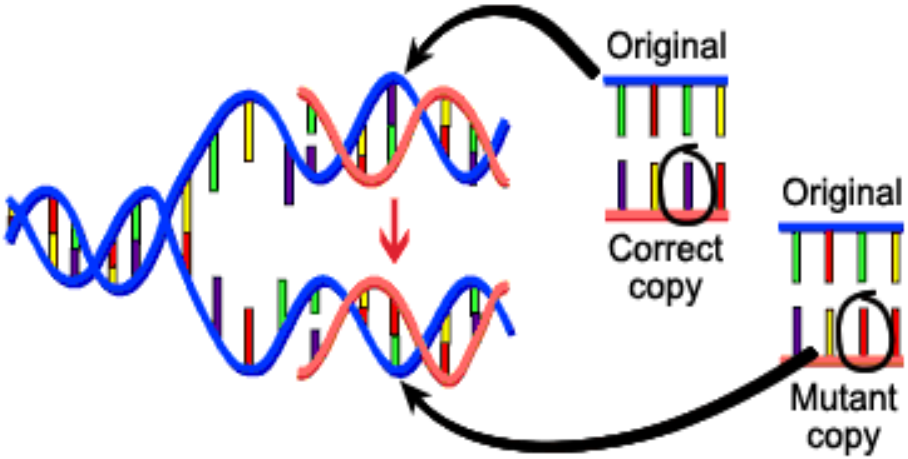
Mutations are random.

- Mutations can be beneficial, neutral, or harmful for the organism, but mutations do not “try” to supply what the organism “needs.

- The only mutations that matter to large-scale evolution are those that can be passed on to offspring. These occur in reproductive cells

Causes of Mutations

- **DNA fails to copy accurately**

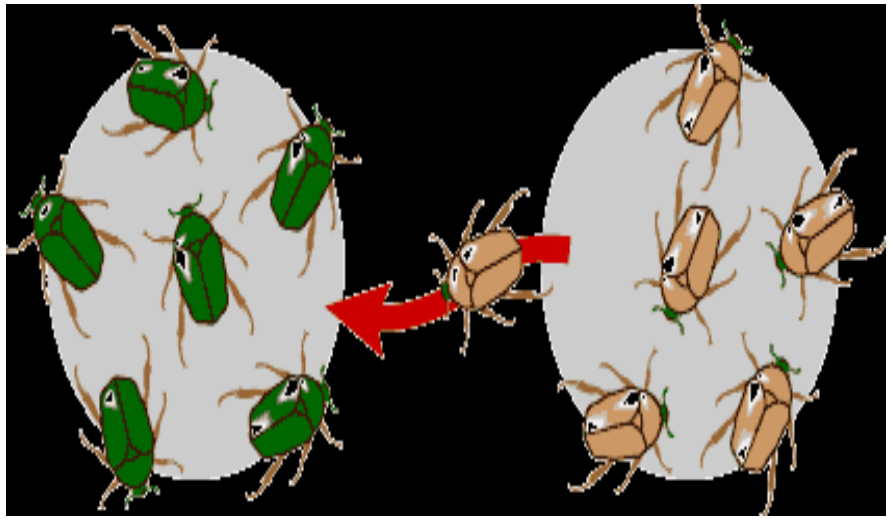


Causes of Mutations

- **External influences can create mutations.**
- Mutations can also be caused by exposure to specific chemicals or radiation.

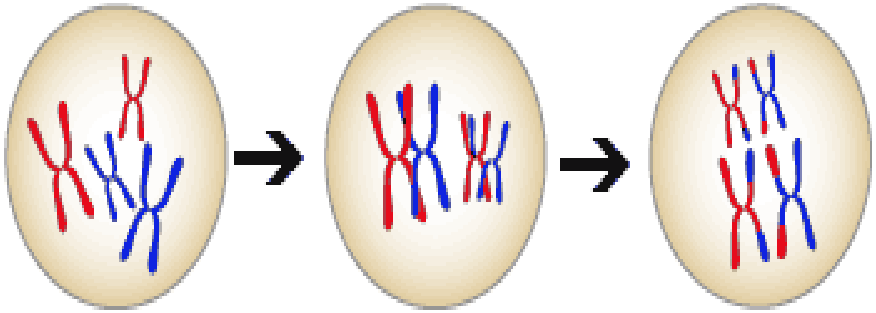
A 2nd cause of genetic Change

- Gene Flow (Migration)
- any movement of genes from one population to another.



A 3rd cause of Genetic Change

- Sex
- when organisms reproduce sexually, some genetic "shuffling" occurs, bringing together new combinations of genes.



What it all means

- These different ways of genetic change are how offspring inherit new or different characteristics.

- Remember;
  - Evolution is the change in genetic characteristics over time.