



**How does
Natural Selection
start?**

What are the Requirements for Natural Selection? (Darwin's Four Postulates)

1. the potential for a species to increase in number;
 1. Potential for reproduction
2. the heritable genetic variation of individuals in a species due to mutation and sexual reproduction;
 2. Genetic variation must be able to occur either by mutation or sexual reproduction
3. competition for limited resources; and
4. the proliferation of those organisms that are better able to survive and reproduce in the environment.
 4. Organisms better suited for the environment reproduce more than those who aren't suited (Survival of the fittest)

What is Adaptation?

- Any heritable characteristic that increases an organisms ability to survive and reproduce in its environment is called an adaptation
- Examples of Adaptations:
 - Tiger's claws
 - Camouflage colors
 - Plant structures
 - Avoidance behaviors





Genetic Variation

The raw material for Natural Selection is genetic variation – differences in DNA

Gene pool is all of the genes that exist in a population

Genetic drift is the changes in allele frequency in a population

Gene flow is the process of alleles moving from one population to another

As new genes and alleles are introduced in a population, if they offer a survival or reproductive advantage, they will be passed on.

The more advantage it offers, the more frequent it will become in the gene pool

Mutations



- DNA may replicate with errors
- Can cause changes in phenotype (way you look)
- If they are beneficial to survival and reproduction, they will be passed on
- Introduces new alleles to the gene pool

Founder Effect

- A few individuals from a population may leave and find a new population somewhere else
- Few individuals may leave and establish a new population
- Introducing new genes to the gene pool / establishing a new gene pool
- They may have a different allele frequency / be only reproducing with each other



Bottleneck Effect

- When the size of a population is dramatically reduced
 - Could be from a natural disaster
- Number of genes in the gene pool are reduced
- Even as the population re-grows, the genetic diversity is smaller

