

## Natural Selection

1. Overproduction- More offspring are produced than can possibly survive to ensure that some members of the species will (fish can produce millions of eggs and only thousands survive).
2. Struggle for Survival- As resources are limited, competition will occur over these limited resources such as food and habitat.
3. Variation- Some members of a population will have a trait or traits that make them able to survive in the current environment, while others will not.
4. Survival of the Fittest- Those with the favorable traits for the current environment will survive, reproduce and pass these traits on to their offspring

Limitations- Darwin knew that favorable traits were passed on, but did not know how as DNA had yet to be discovered as the means of heredity.

## Mechanisms of Evolution

1&2. Mutations are changes in DNA that can be caused by radiation or mistakes when it is copied.

3.

Mutation	Description
Substitution	One base is exchanged for another
Insertion	One base is added somewhere to the sequence
Deletion	One base is removed from the sequence
Frameshift	Because of a removal or addition of a base, the sequence is thrown off and bases are mis-paired

4. Mutations are changes to DNA, which can result in the appearance of new traits in a population. These new traits could increase the chances of survival in a given environment.

## Modern Theory of Evolution

- Darwin was unable to explain the means by which traits are passed on from one generation to the next (he didn't know that DNA was the means of heredity).

- Two sources of variation- mutations and sexual reproduction (unique combination of traits passed on from both parents)
- Frequency of favorable traits- favorable traits that increase chances of survival will be passed on to offspring and will be seen more often in a population as long as the environment continues to select for them
  - Adaptations are favorable traits