



# Modes of Natural Selection

Unit 6 Lesson 3

## Modes of Natural Selection

### Students will be able to:

- Know about natural selection.
- Know the key points of natural selection.
- Understand the modes of natural selection with examples.

### Key Vocabulary:

Darwin, natural selection, modes of natural selection.

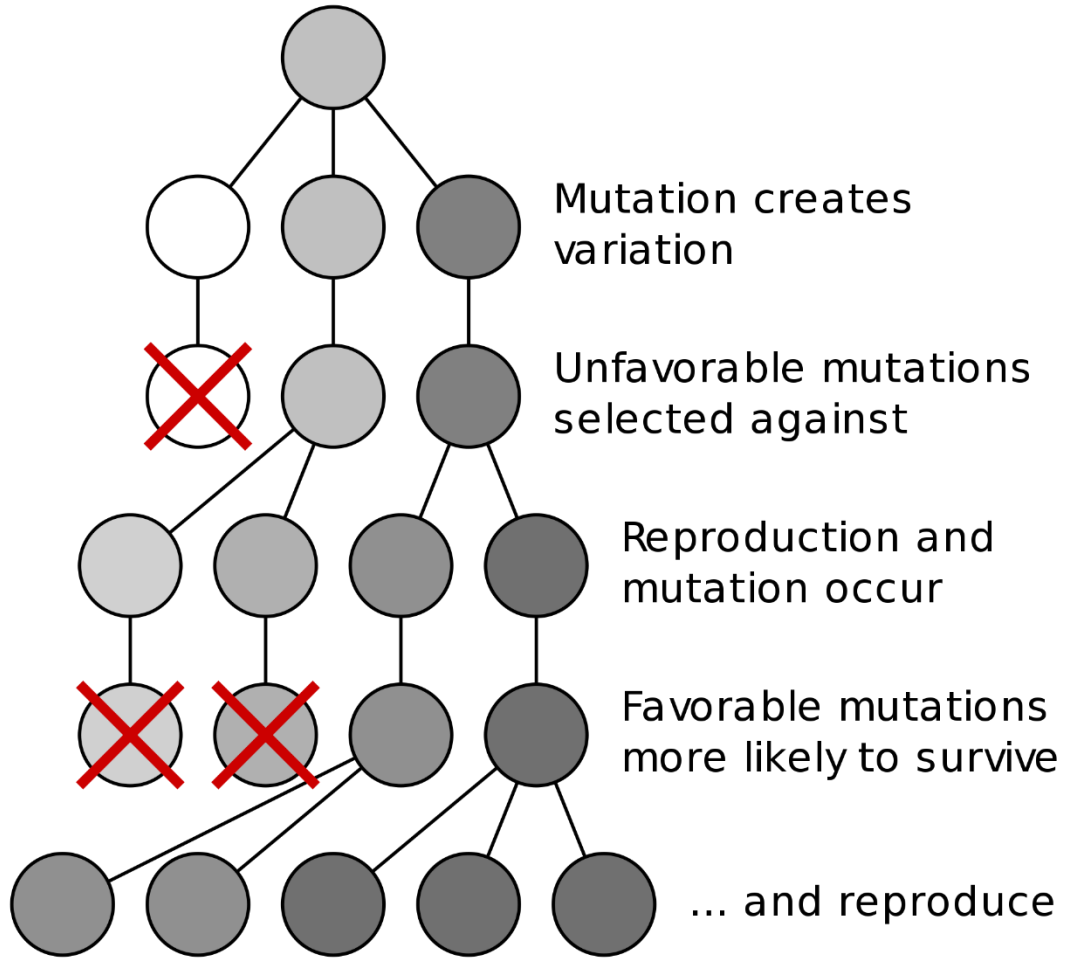
### Natural Selection

- It is a random process that results in the survival and reproduction of organisms that is best adjusted to the environment and the trait is **heritable**.
- It occurs in an individual of a species and it may or may not be inherited.

### Key Points of Natural Selection

- Natural selection leads to adaptive evolution that provides the organism with some beneficial traits.
- Adaptation occurs in an organism that helps the organism to **survive and reproduce** in adverse environmental conditions.
- Darwin's theory for evolution talks about divergence of species. It suggests that all living organisms evolved from **a common ancestor**.

# Modes of Natural Selection



### Modes of Natural Selection

- Stabilizing Selection
- Directional Selection
- Disruptive Selection

These are also considered as examples of the **adaptive evolution**.

### Stabilizing Selection

- It favors the major and well-suited phenotype in a population.
- It is the **most common** mode of natural selection in evolution.
- It does not lead to any **adaptive change** or evolution.
- Here the genetic diversity decreases with the stabilization of population.

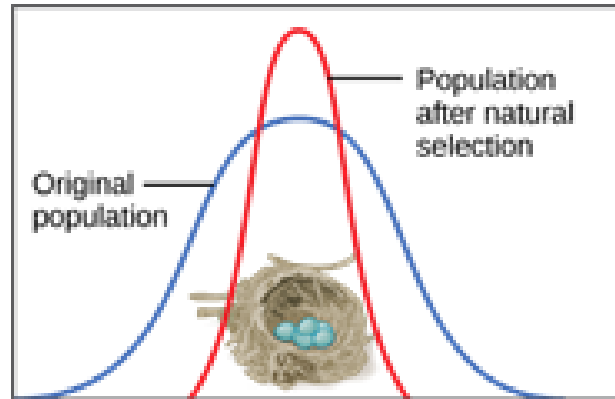
### Examples of Stabilizing Selection

- **Birth weight of human babies:** Average weight of human baby is considered normal.
- **Length of flowers with nectars:** Flowers positioned at medium height is favored for pollination.
- **Height of a plant:** The plants with **medium height** will be extremely likely to survive even in adverse climatic conditions.



### Stabilizing Selection Curves

- Curves are bell shaped with no skews. The peak here is **higher** than the normal peak.
- Robins lay four different types of eggs that vary in size. Only the eggs of average size produce normal chicks while larger eggs produce abnormal chicks and smaller eggs produce malnourished chicks.



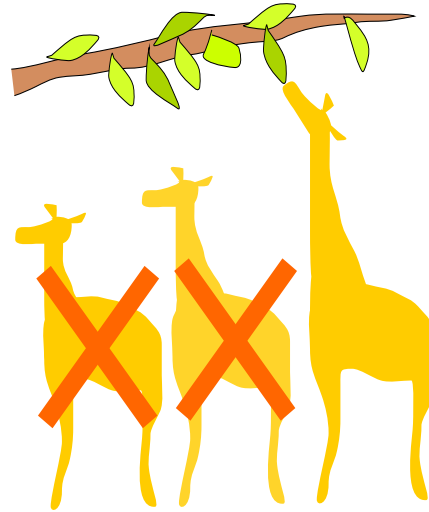
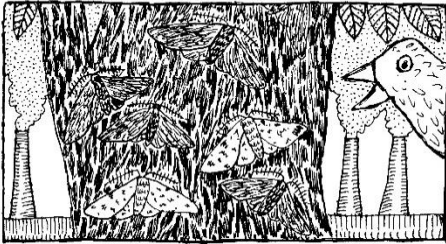
### Directional Selection

- **A single phenotype** is favored that leads to shift in the allele frequency in **one direction**.
- This selection occurs in one direction where one trait is more successful over the other.
- It can also lead to increase in the biomass of the seed production.
- It is the most talked about mode of selection in evolution.

# Modes of Natural Selection

## Examples of Directional Selection

- **Peppered moth selection due to Industrial Revolution.**
- **Neck length of Giraffe.**



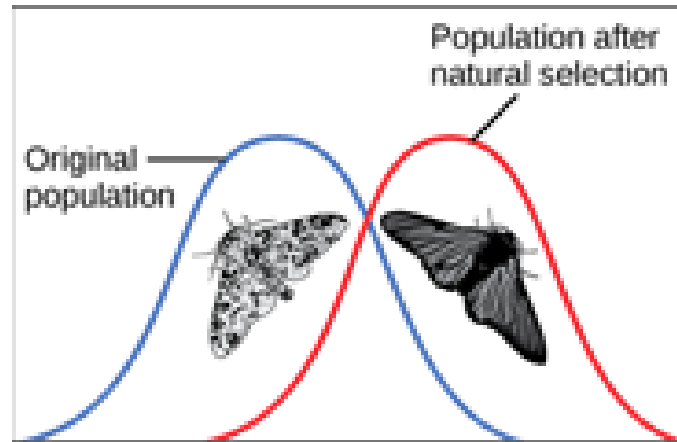
### Directional Selection Curves

- The curves are bell shaped.
- The bell curves move on one direction. Either on the left side or right side.
- These curves depend on the color of the population and type of food availability.

# Modes of Natural Selection

## Directional Selection Curves

- Due to industrial revolution in England, the dark colored moths were able to mingle with the branches and trunks of trees that got covered with black soot. This caused the light colored moths to be picked up by the predators. Before industrial revolution, the dark colored moths were attacked by predators.



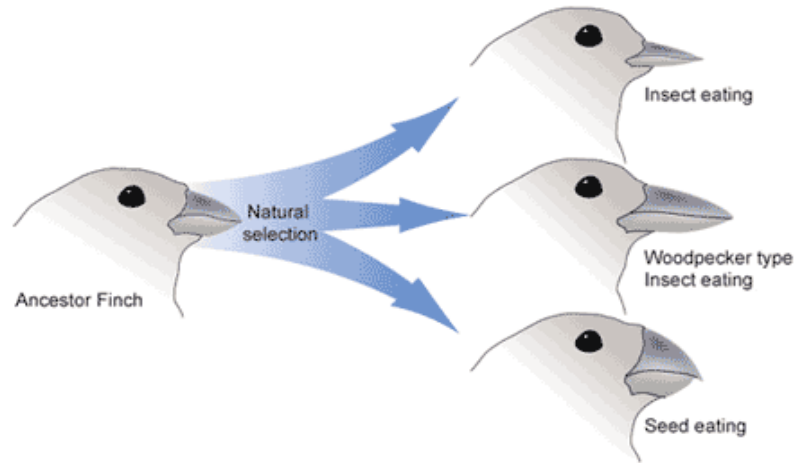
### Disruptive Selection

- It is also known as diversifying selection.
- Here extreme values for a trait are favored rather than the intermediate values.
- It also plays role in **speciation** or **sympatric speciation**.
- It is often considered opposite of **stabilizing selection**.

# Modes of Natural Selection

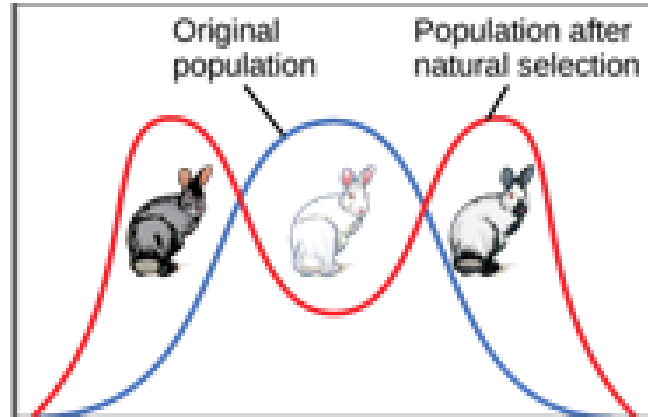
## Examples of Disruptive Selection

- Darwin's finches
- Different traits in plants



### Disruptive Selection Curves

- These are bell curves with skew in the middle.
- These have two peaks and one valley in between the peaks.
- The grey Himalayan rabbits are can blend with rocky mountains than black and white rabbits.





### Summary

- Natural selection can take place in many forms such as stabilizing selection, disruptive selection and directional selection.
- The modes of natural selection are also called examples of adaptive evolution.
- The three modes of natural selection have different examples to prove their occurrence in the environment.
- all the three modes differ from each other.