

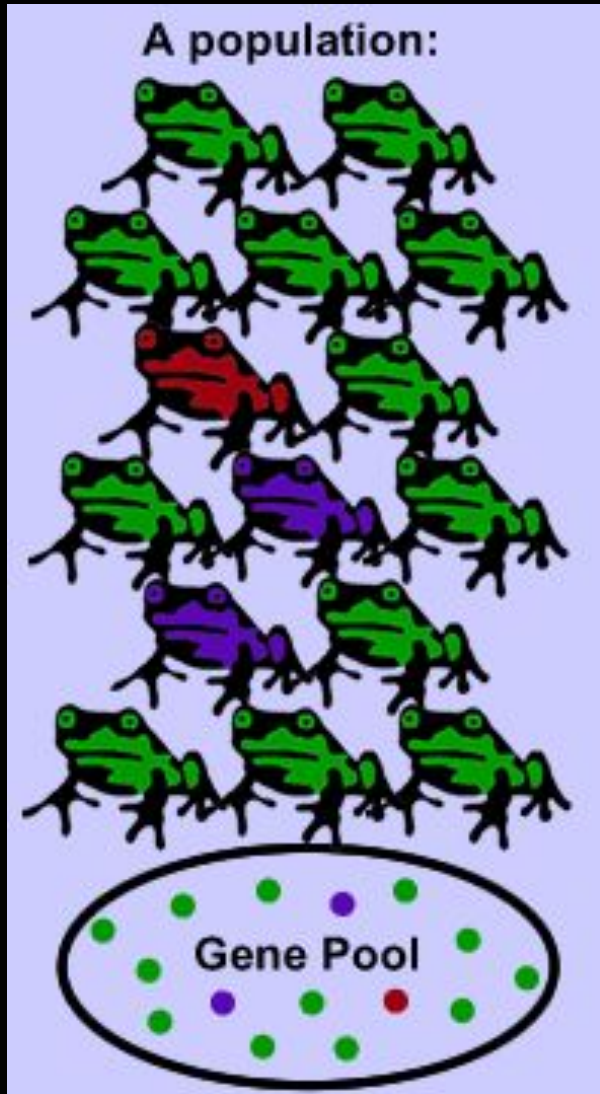
# Genes and Variation



# Learning Objectives

- Explain what a gene pool is
- Identify the main sources of inheritable variation in a population

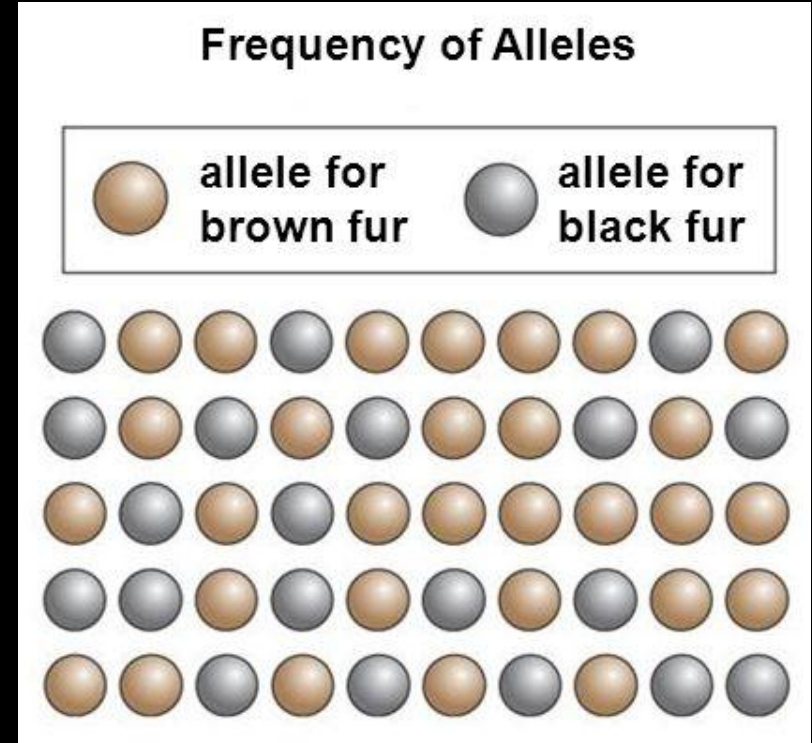
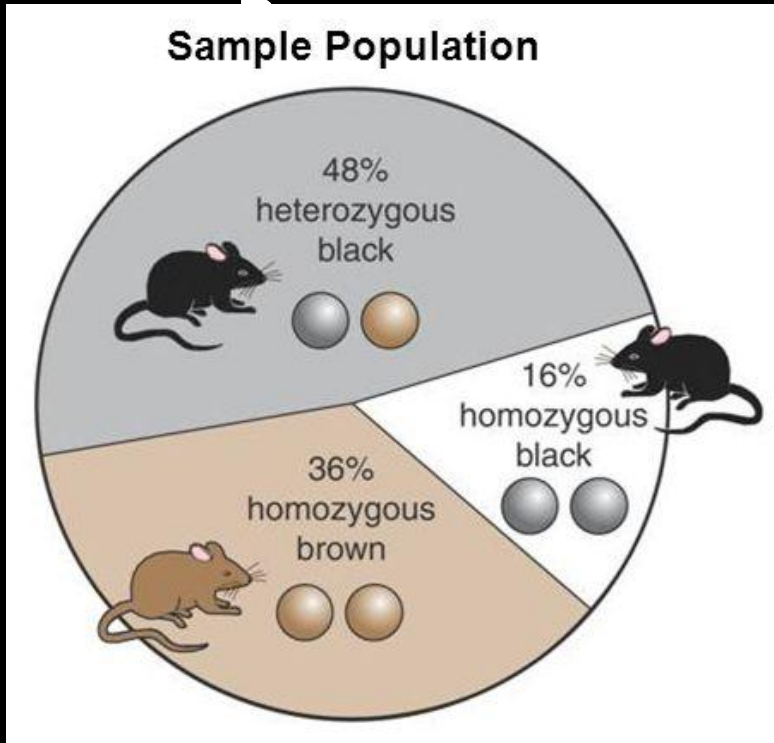
# Gene Pool



**Gene pool** - sum total of all the genes, including all alleles in a population



# Relative Frequency



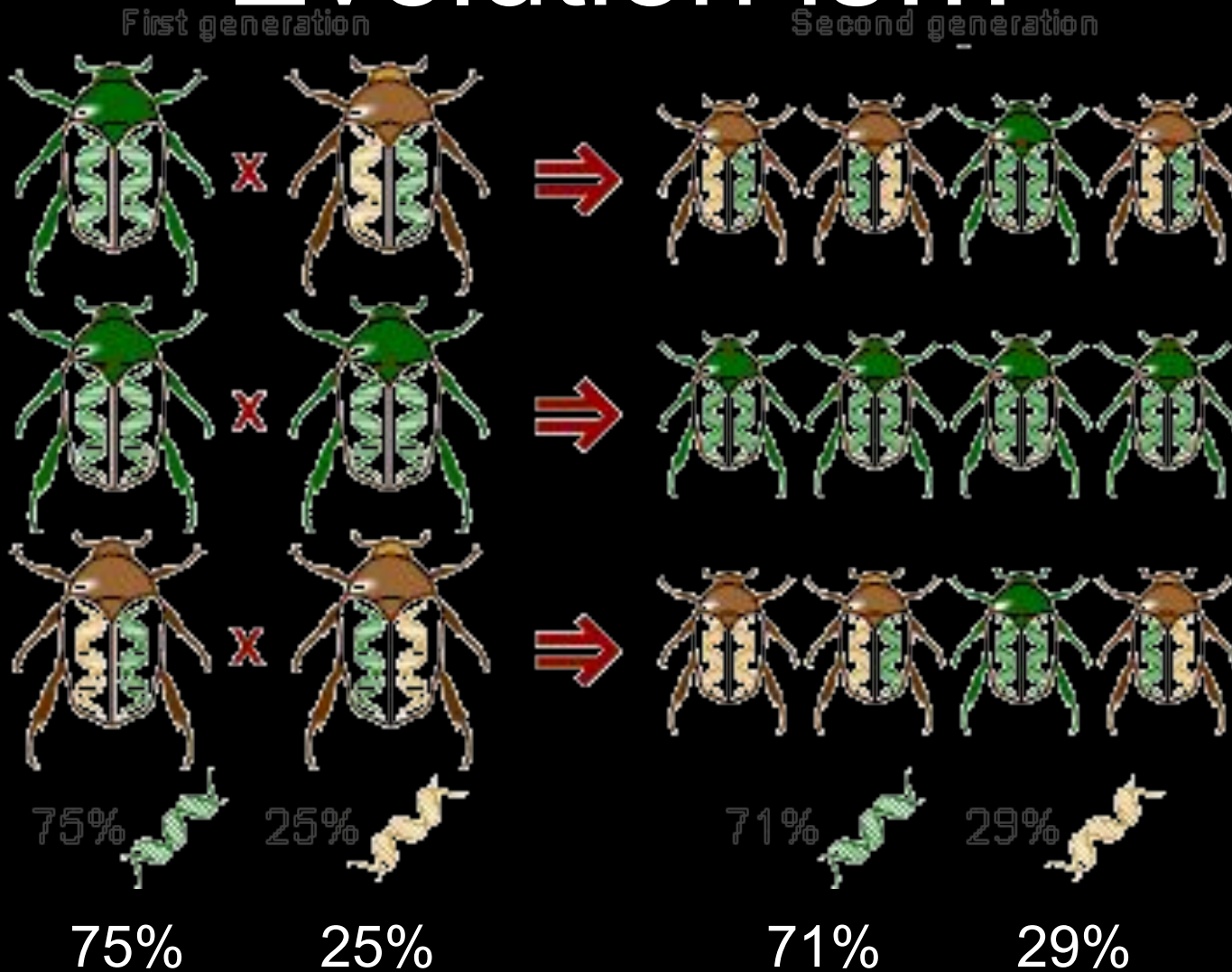
**Relative frequency** - the number of times that the allele occurs in a gene pool.

# Genetic Equilibrium



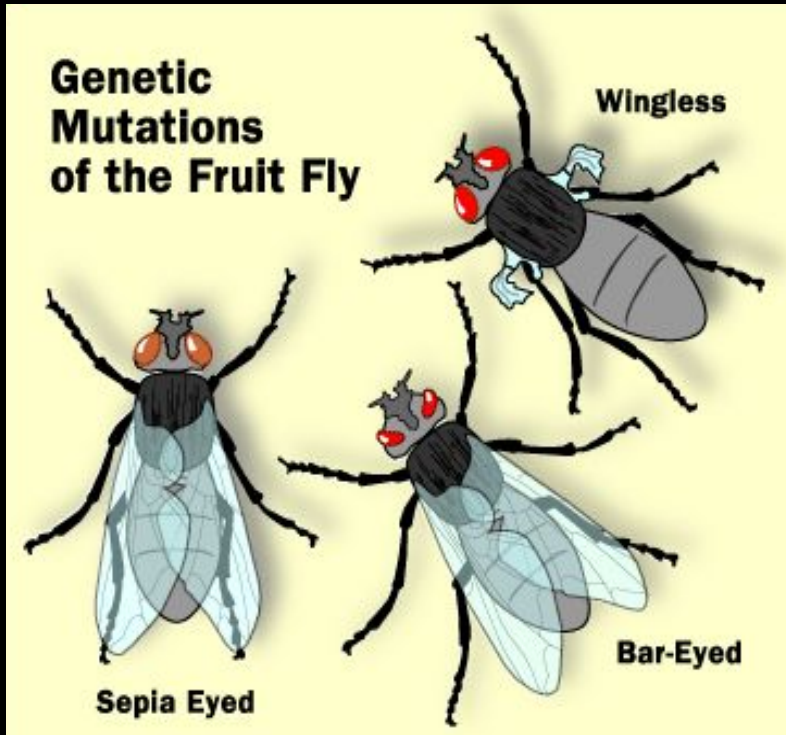
Genetic equilibrium - allele frequencies remain constant

# Evolution is...



...any change in the relative frequency of alleles in a population

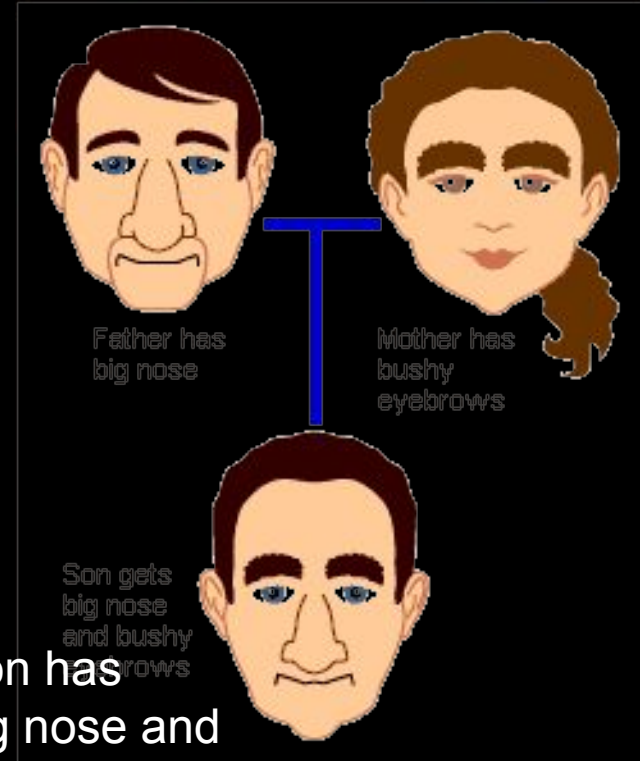
# Sources of Genetic Variation



Mutations

Father has big nose

Mother has Bushy eyebrows



Son has big nose and bushy eyebrows

Gene Shuffling

# Importance of Genetic Variation



A variety of traits must be present in the population to adapt to the changing environment.



# Stop Here



# Polygenic Trait



Height is an example of a polygenic trait.

# Class Height Measurement

1. Each student will have their height measured.
2. Record the height of each student in data table.
3. Graph frequency (y-axis) vs. height (x-axis)

# Single-Gene Trait



A single-gene trait is controlled by a **single gene** that has **two alleles**. Only two phenotypes.

# Inherited Variation vs. Artificial Selection



Inherited variation is  
passed on through  
**genetics**



**Breed** plants and  
animals for **particular**  
**traits**