

## 23 The Evolution of Populations

**ESSENTIAL QUESTION:** *Are we evolving?*

**Vocabulary:**

Gene/allele/locus  
Genotype frequency/phenotype frequency  
Genetic equilibrium  
Inbreeding depression/fitness/assortative mating  
Founder effect/bottleneck  
Gene flow  
Stabilizing selection /directional selection/disruptive selection  
Polymorphism/heterozygote advantage  
Population  
Microevolution  
Discrete characters/quantitative/average heterozygosity characters  
Geographic variation/cline  
Intrasexual selection/intersexual selection/balancing selection

**Book Diagrams and Charts:**

- *Figure 23.4 cline determined by temperature*
- *Figure 23.7 Hardy-Weinberg principle*
- *Figure 23.8 genetic Drift*
- *Figure 23.9 Bottleneck effect*
- *Figure 23.12 Gene Flow and selection*
- *Figure 23.13 Modes of Selection*
- *Figure 23.17 mapping malaria and the sickle-cell allele*
- Table 18-2 Genetic Polymorphism of selected enzymes

**Diagram:**

$$p^2 + 2pq + q^2 = 1 \quad p^2 =$$
$$2pq$$
$$q^2$$

**Questions**

1. What are the five agents of evolutionary change?
2. What is the Hardy Weinberg formula? What does it describe?
3. Give an example of a heterozygous advantage and how does it provide an advantage

