



SECTION 11.3 | OTHER MECHANISMS OF EVOLUTION
Reinforcement

KEY CONCEPT Natural selection is not the only mechanism through which populations evolve.

Three other mechanisms through which populations can evolve are gene flow, genetic drift, and sexual selection.

Gene flow is the movement of alleles between populations. When individuals of one population leave that population to join a new one, they take their alleles with them. Emigration is the process of leaving a population and immigration is the process of joining a new population. Gene flow between neighboring populations helps to keep their gene pools similar. However, if gene flow between such populations stops, they will become more and more genetically different.

Genetic drift accounts for changes in allele frequencies that are due to chance. Smaller populations are more affected by genetic drift because there are less alleles to “balance out” the effect of random changes. Due to chance alone, some alleles will likely become more common, while others will become less common and eventually disappear. Genetic drift therefore decreases genetic variation in a population. Two situations commonly cause populations to become small enough for genetic drift to occur.

- During the **bottleneck effect**, genetic drift occurs after an event drastically reduces the size of a population.
- During the **founder effect**, genetic drift occurs after a small number of individuals colonize a new area, starting a new population.

Sexual selection occurs when certain traits increase mating success, as a result of females being choosy about their potential mates. This drives competition among males to mate with quality females. During intrasexual selection, males fight with each other for the right to mate with a female. During intersexual selection, males display certain traits to try to impress females. Traits that help males to win mates become selected for generation after generation. Over time, these traits can become highly exaggerated, such as the brightly-colored tail feathers of peacocks.

CHAPTER 11
The Evolution of Populations

1. How can gene flow result in changes in allele frequencies?

2. Why are smaller populations more affected by genetic drift?

3. How can sexual selection lead to highly exaggerated traits among males?

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