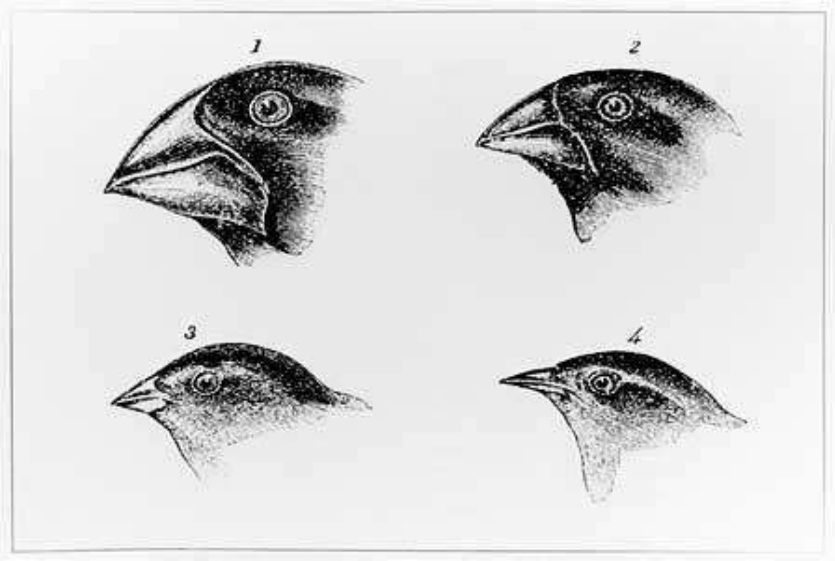
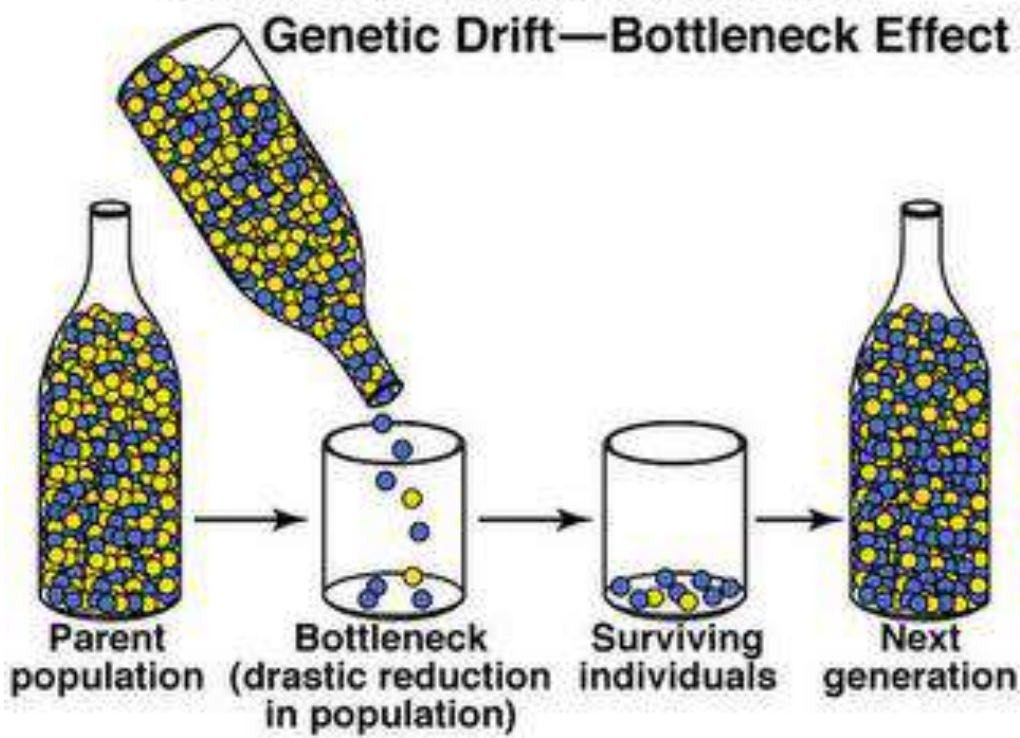
16-2 Evolution as Genetic Change

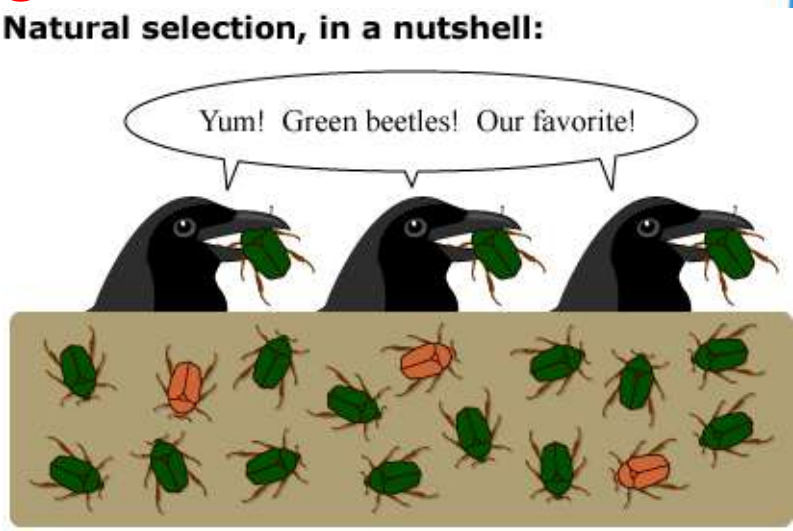




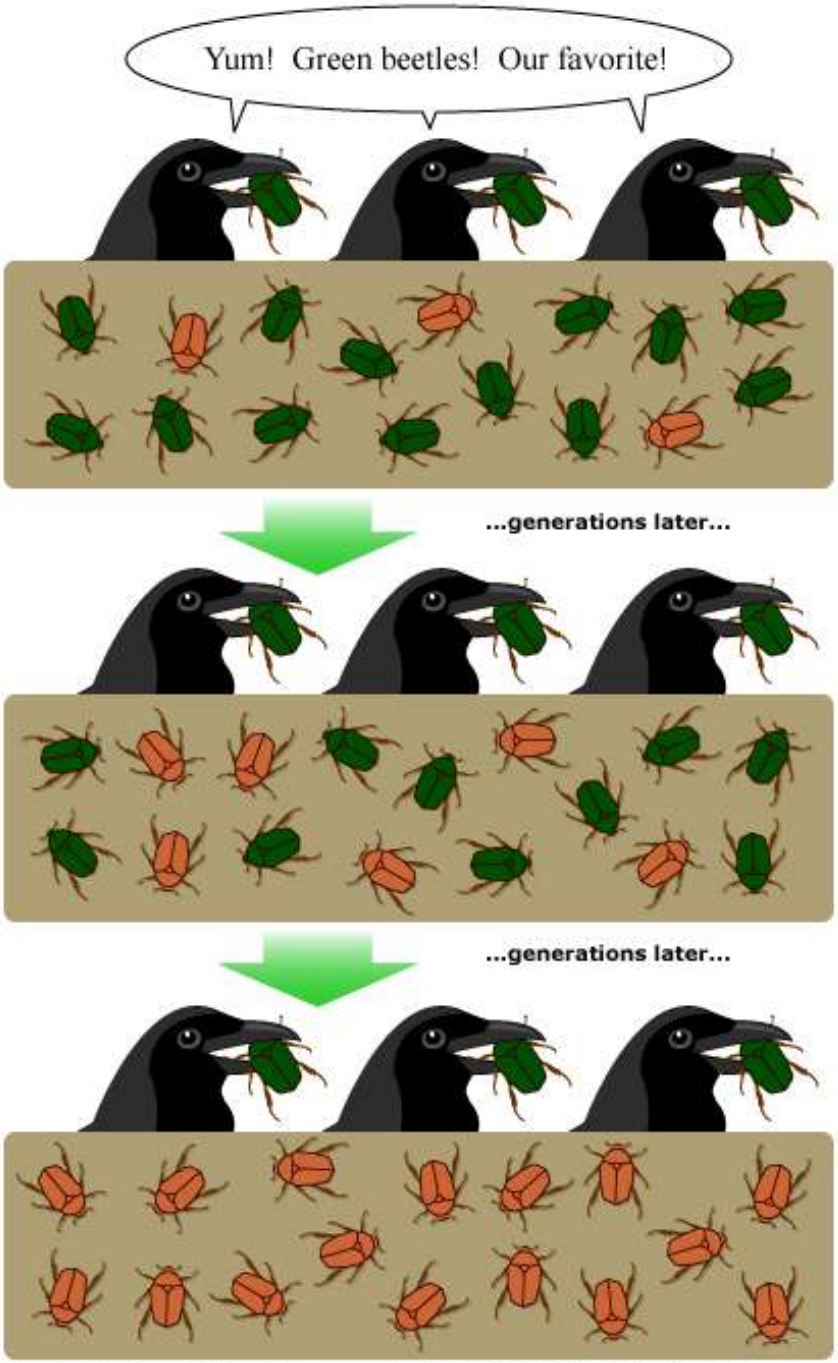
Natural selection affects which individuals survive and reproduce and which do not.

Evolution is any change over time in the relative frequencies of alleles in a population.

Populations, not individual organisms, can evolve over time.

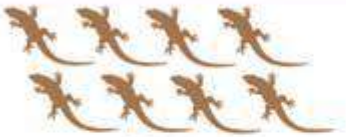
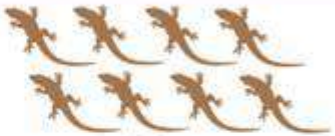
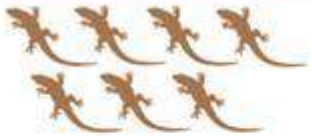


Natural selection on single-gene traits can lead to changes in allele frequencies and thus to evolution.



Green beetles have been selected against, and brown beetles have flourished.

Effect of Color Mutations on Lizard Survival

Initial Population	Generation 10	Generation 20	Generation 30
 80%	 80%	 70%	 40%
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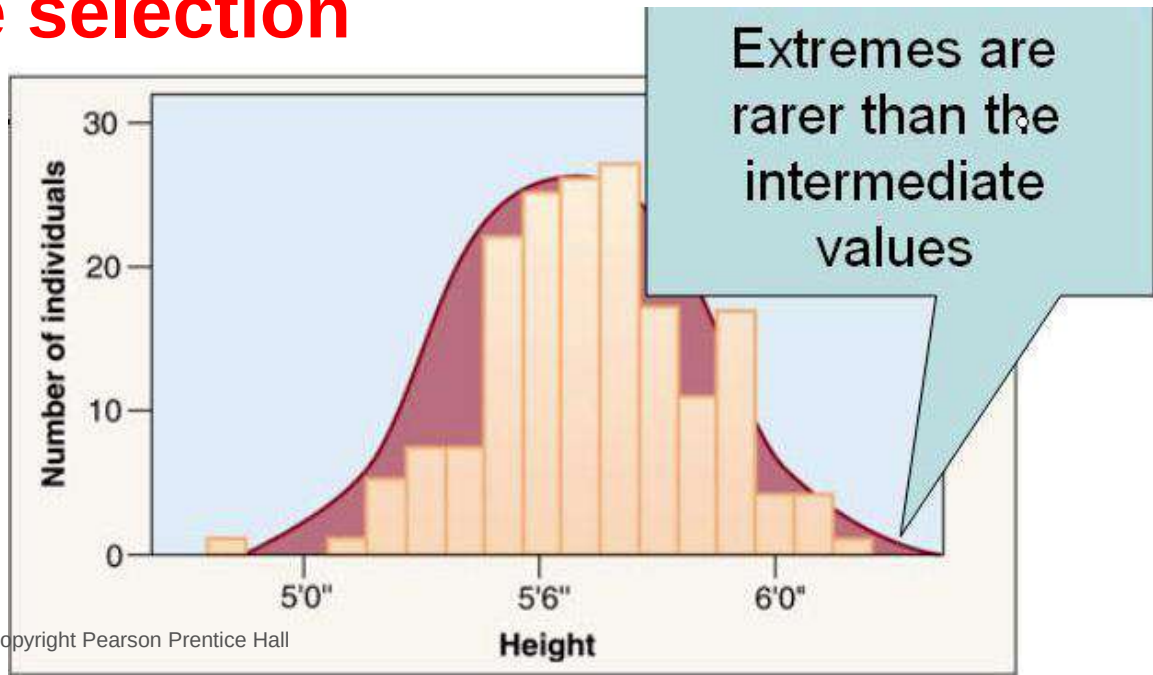
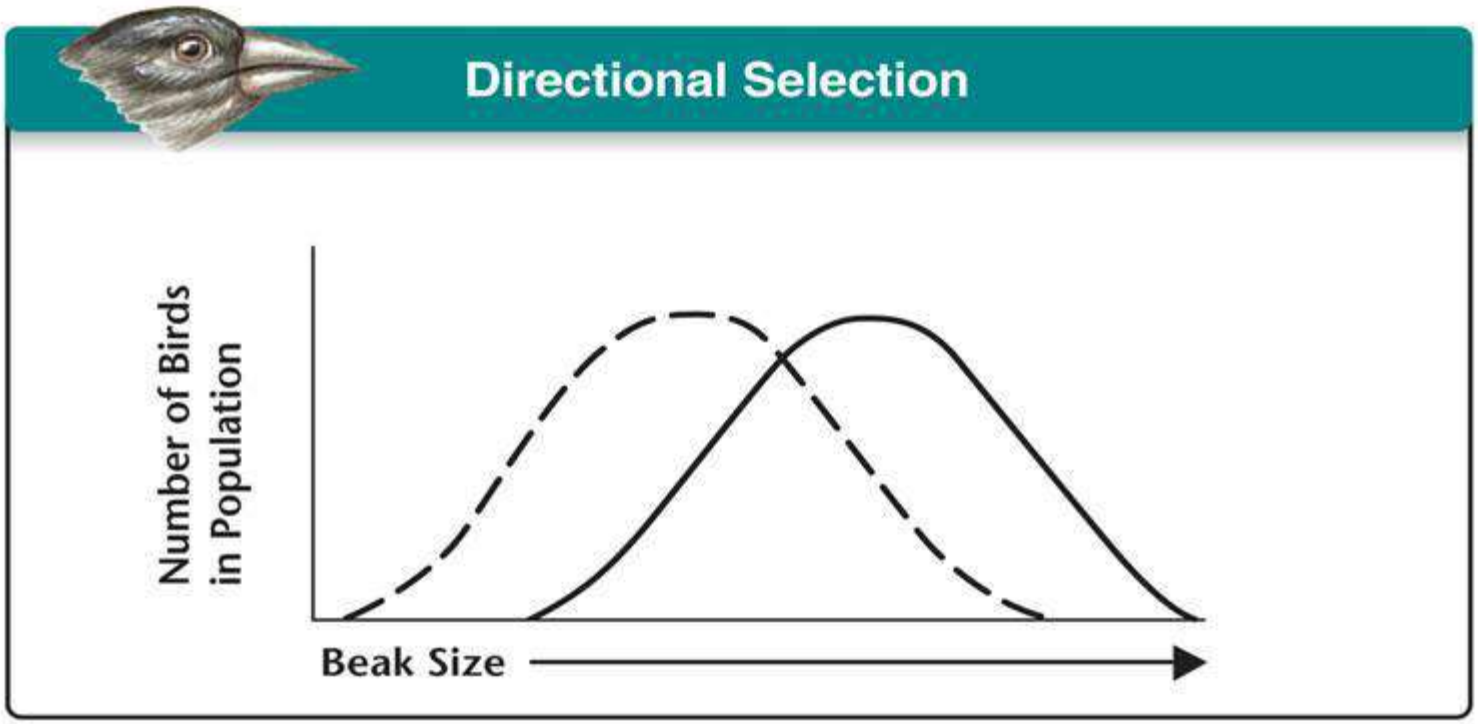
Natural selection can affect the distributions of phenotypes in any of three ways:

- directional selection
- stabilizing selection
- disruptive selection



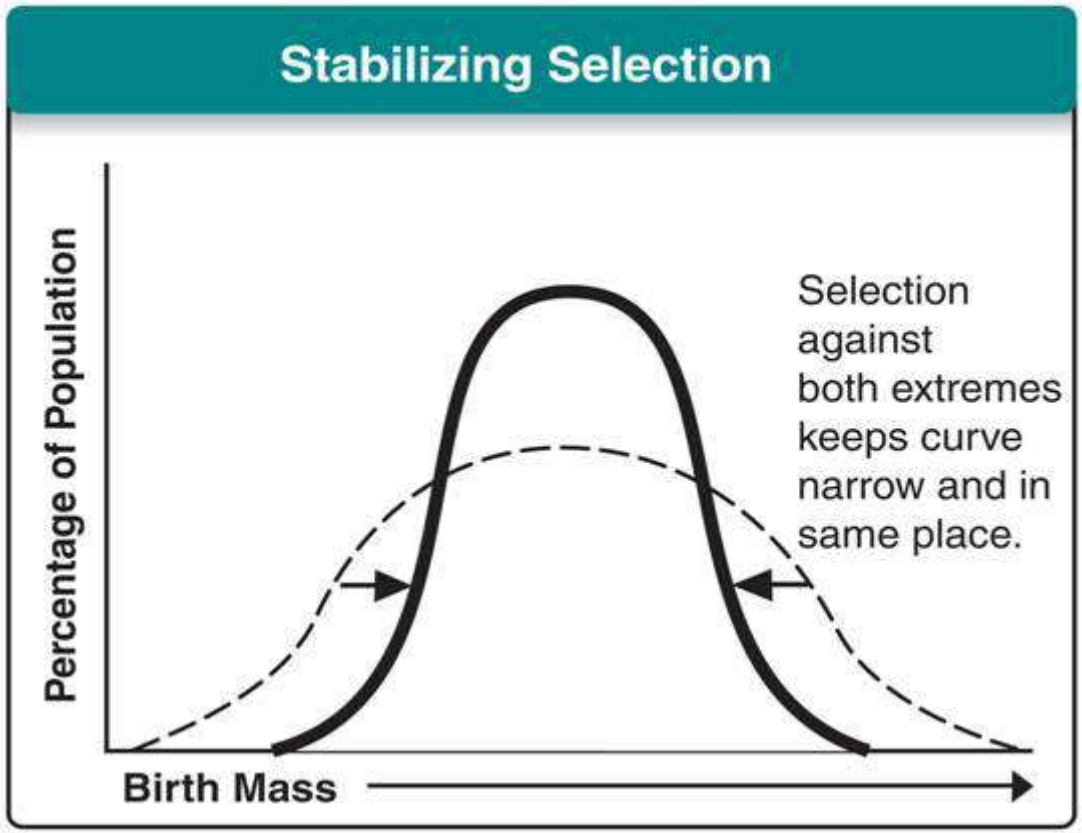
Directional Selection

When individuals at one end of the curve have higher fitness than individuals in the middle or at the other end, **directional selection** takes place.



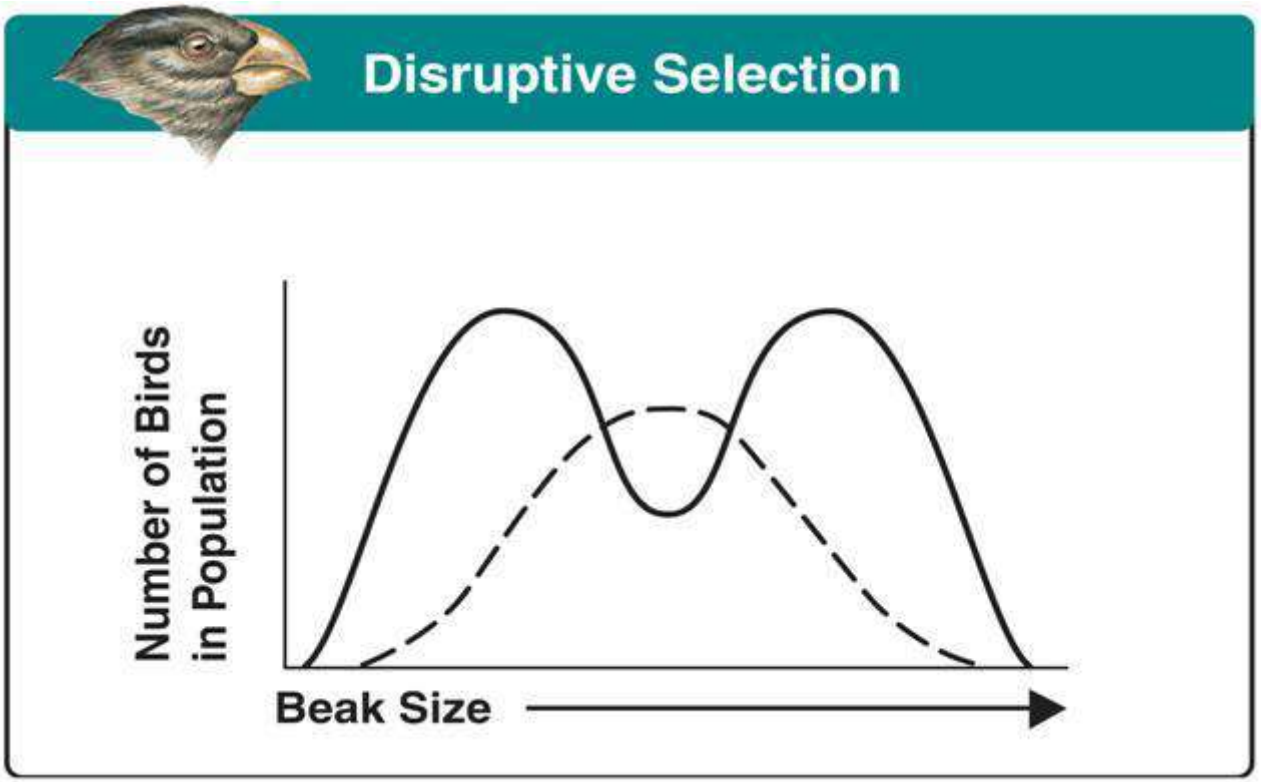
Stabilizing Selection

When individuals near the center of the curve have higher fitness than individuals at either end of the curve, **stabilizing selection** takes place.



Disruptive Selection

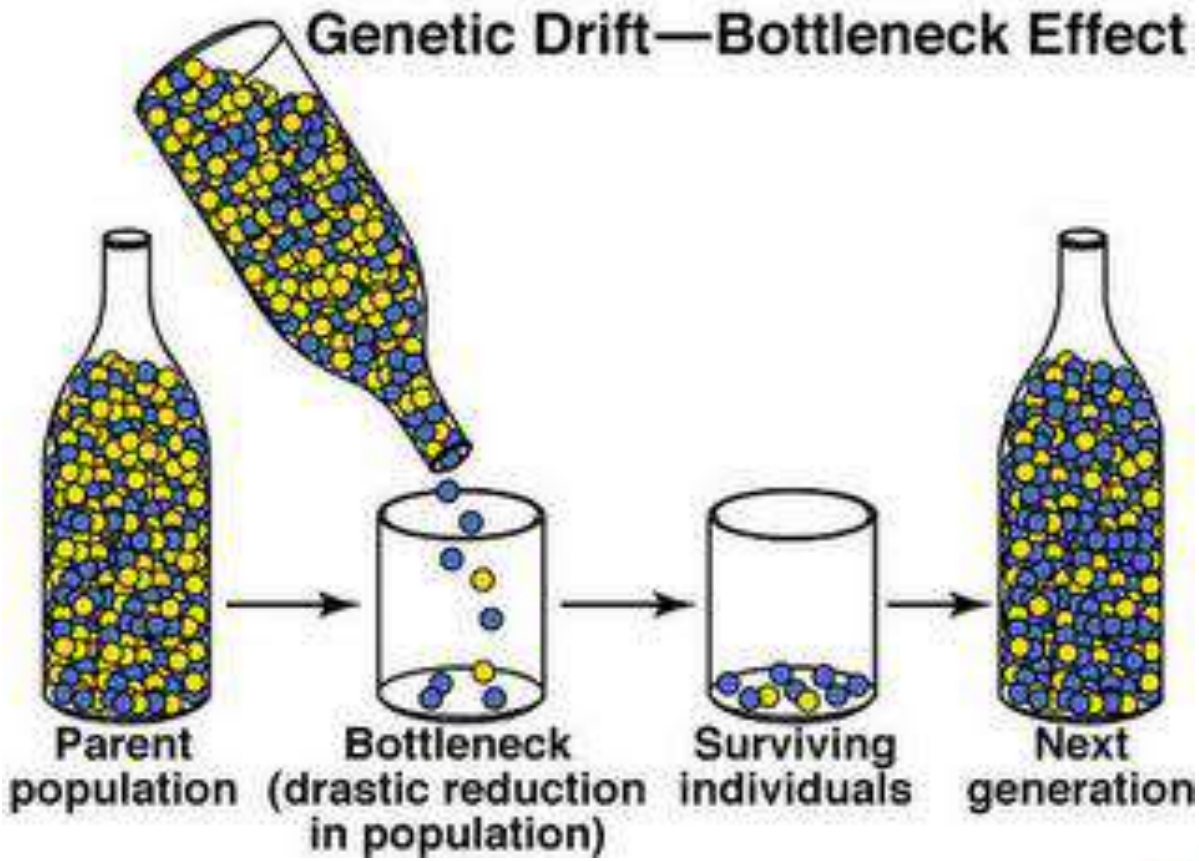
When individuals at the upper and lower ends of the curve have higher fitness than individuals near the middle, **disruptive selection** takes place.



Genetic Drift

What is genetic drift?

- A **random** change in allele frequency.



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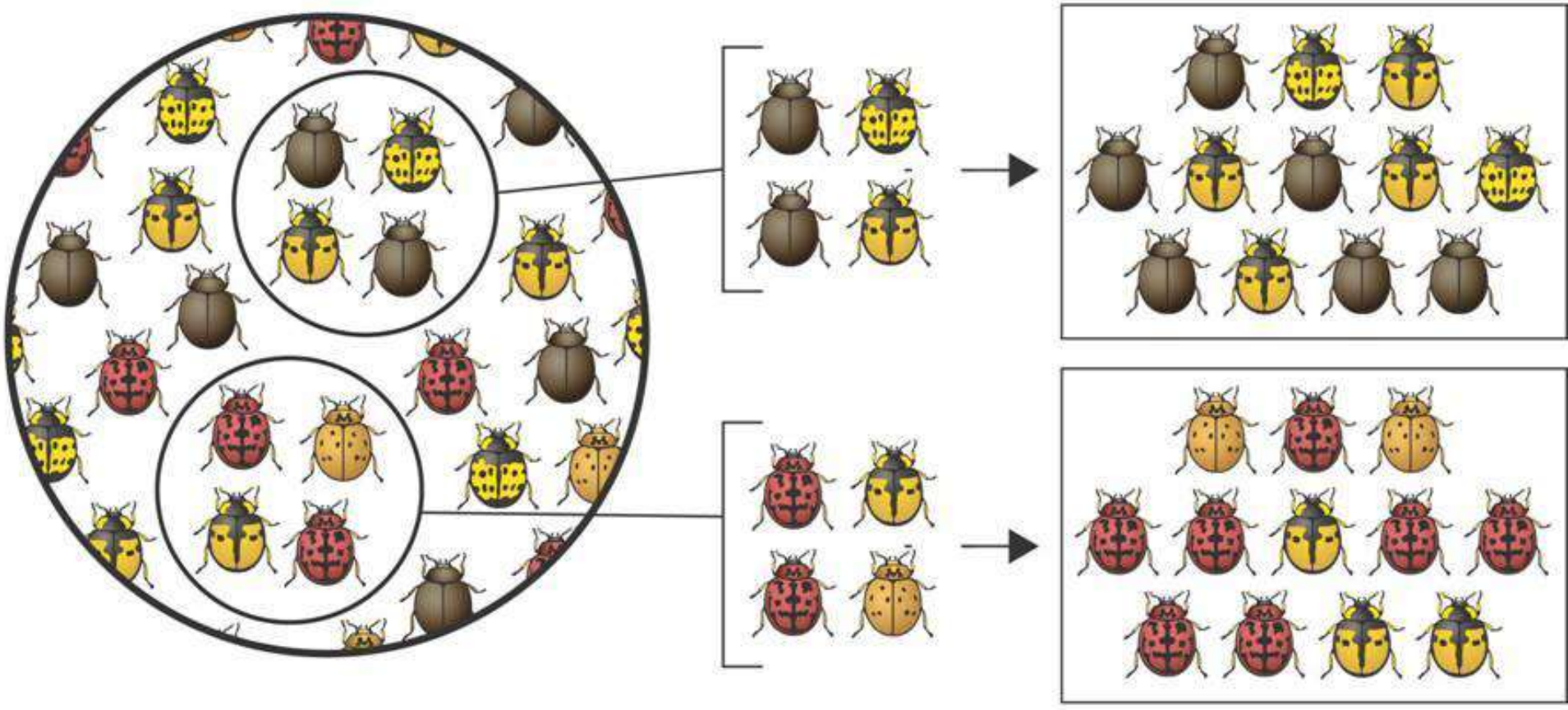
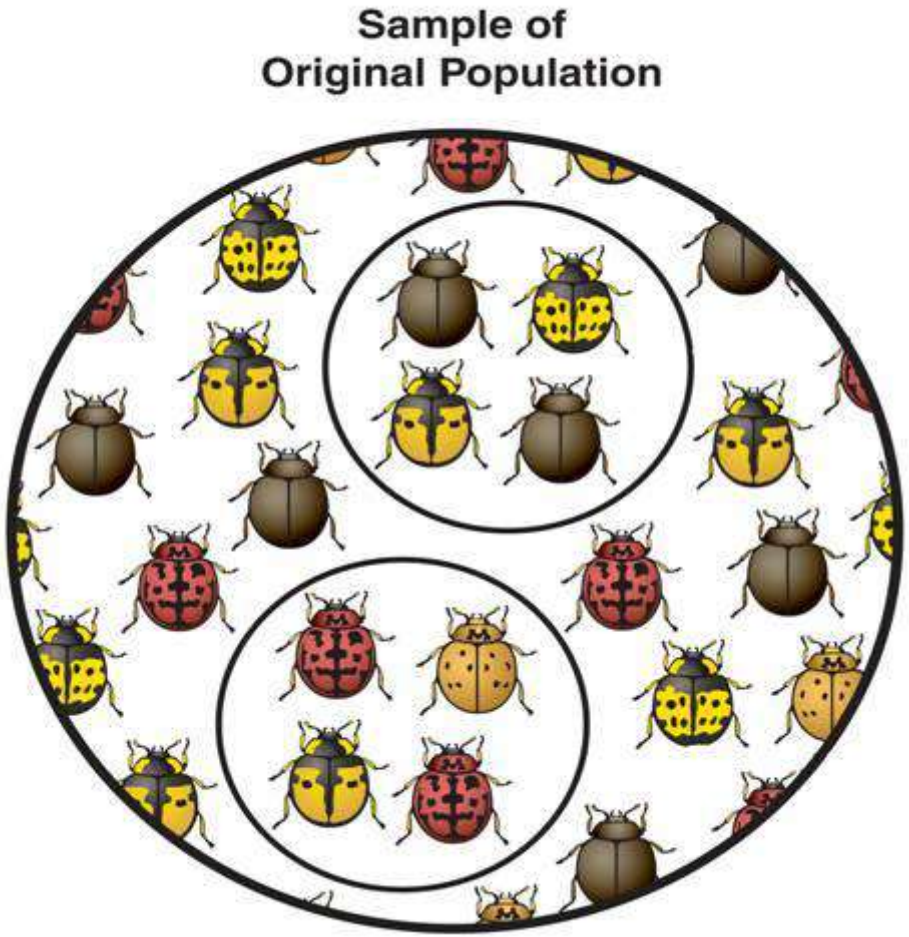
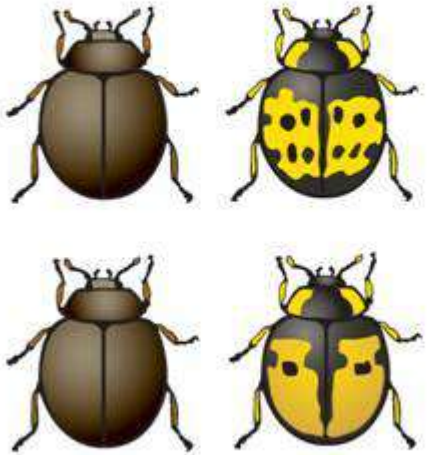
Genetic drift may occur when a small group of individuals colonizes a new habitat.

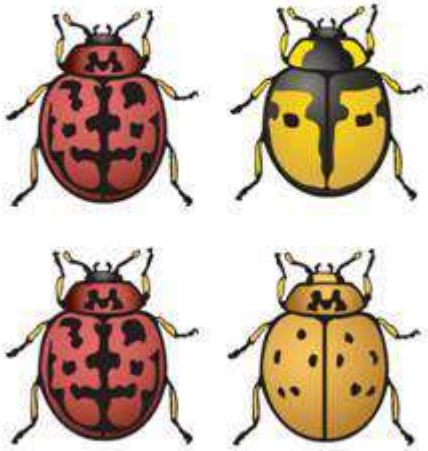




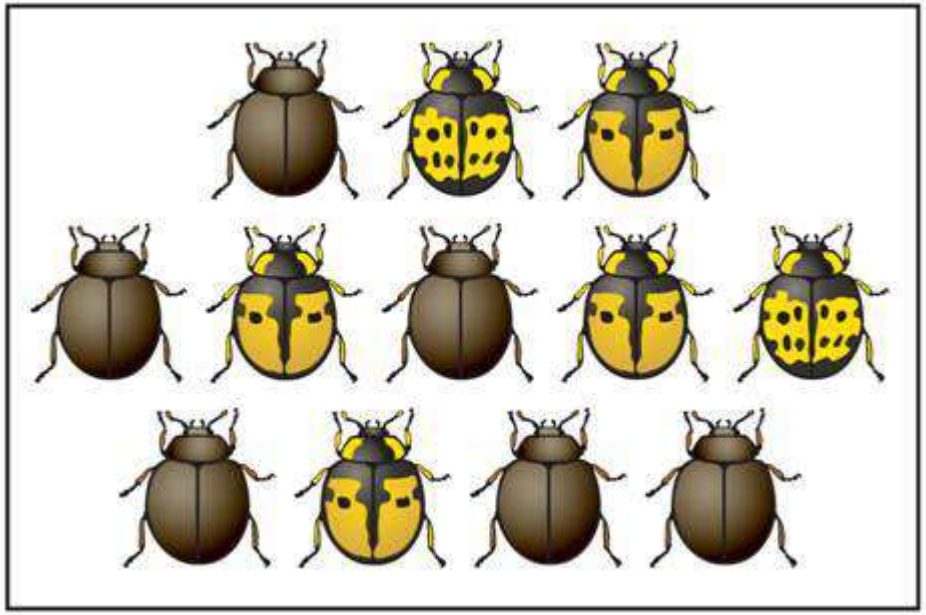
Founding Population A



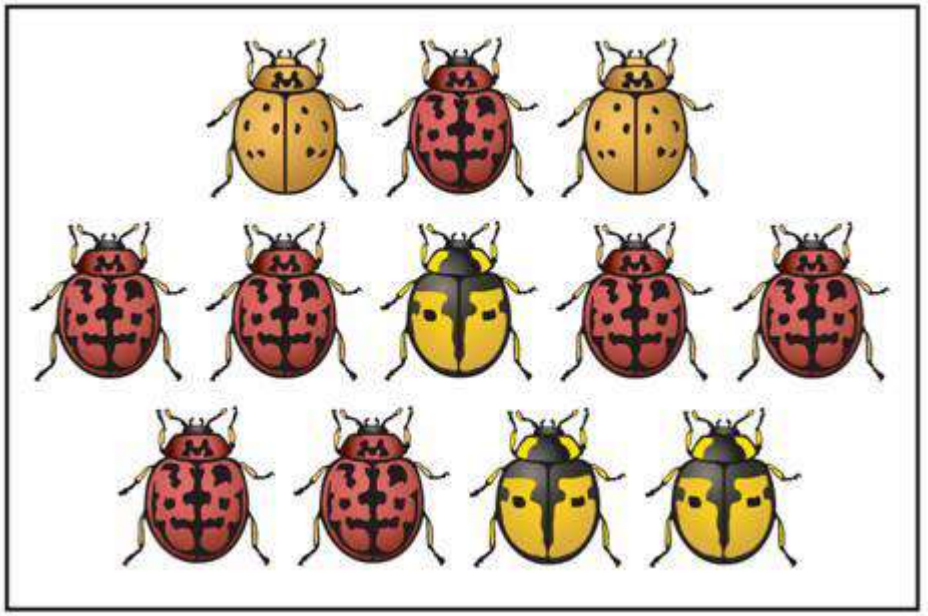
Founding Population B



Descendants



Population A



Population B

When allele frequencies change due to migration of a small subgroup of a population it is known as the **founder effect**.

16-2 Section QUIZ

Continue to:

Section QUIZ

- or -

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1 Which of the following patterns of natural selection on polygenic traits favors both extremes of a bell curve?

a. stabilizing selection

b. disruptive selection

c. directional selection

d. genetic drift

2 Which of the following events could lead to genetic drift?

a. A few new individuals move into a large, diverse population.

b. A few individuals from a large, diverse population leave and establish a new population.

c. Two large populations come back together after a few years of separation.

d. The mutation rate in a large population increases due to pollution.

3 The situation in which allele frequencies remain constant in a population is known as

a. genetic drift.

b. the founder effect.

c. genetic equilibrium.

d. natural selection.