

#Ways to

Guided Notes: Mechanisms for Change

Hardy-Weinberg Principle - when allelic frequencies remain constant, a population is at genetic equilibrium. constant portion of dom & rec alleles

5 Conditions of the Hardy-Weinberg Principle

1. Population must be large
2. There is not immigration (IN) or emigration (OUT)
3. mating is random
4. mutations do not occur
5. natural selection does not occur

***All 5 conditions are mechanisms for evolutionary change!

Mechanisms for change:

1. Genetic Drift - change in allelic frequency.
EX) "lose" alleles

Types of Genetic Drift

A. Founder Effect - small sample of population settles in a location separated from the rest of the population.
EX) Amish, 6 fingers

B. Bottleneck - Population declines to very low number then rebounds
EX) cheetahs

2. Gene Flow - genes entering or leaving a population

3. non random mating - inbreeding due to locality

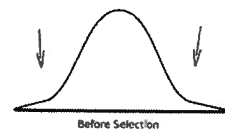
4. mutation - random change in genetic material (DNA)

5. Natural Selection selecting individuals that are well suited to the environment
"best adapted/fit"

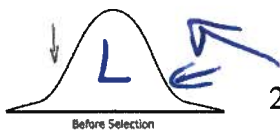
EXAMPLES of NATURAL SELECTION

1. Stabilizing Selection - Most common trait is selected for
EX) normal birth weight

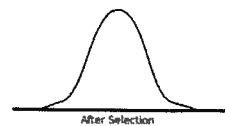
Stabilizing Selection



Directional Selection



2. Directional Selection - One extreme trait is selected for
EX) peppered moths

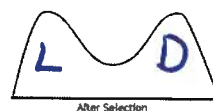


3. Disruptive Selection - Splits population into two extremes
EX) shell color

Disruptive Selection



4. Sexual Selection - trait is selected because it is attractive to a mate
EX) peacocks



Evolution Loose Ends

Other Evolution Controls:

Prezygotic Isolation - make fertilization unlikely
"before" EX) birds

Postzygotic Isolation - offspring do not develop or reproduce
"after" EX) Liger (Tiger & Lion)

Evolution of New Species

speciation - creation of new species (genetically different!)

1) Allopatric Speciation - physical barrier separates population
EX) Kaibab & Alberta Squirrels

2) Sympatric Speciation - no physical barrier
EX) Insects

Evolutionary Patterns

Adaptive Radiation (Divergent) - creation of new habitat or other ecological opportunity causes explosion of new species
EX) Finches

Co-evolutions - species developed in close relation that one affects the other
EX) moths & orchids

Convergent Evolution - development of the same traits even though they live in different parts of the world
EX) Mara & rabbit

Evolutionary Advantages

camouflage - blending in to your environment
EX) leaf sea Dragon

mimicry - looking like another species
EX)

milk snake & coral snake
colored
Red, Black, Yellow