

Evolution of Populations

Name _____

Date _____

Block _____

Natural selection acts on individuals

- differential survival
 - o "_____"
 - o Limited quantities of _____ lead to a struggle for survival results, and as a result those that are the _____ can only survive.
- differential reproductive success
 - o _____

Populations evolve

- _____ of population changes over time
- favorable traits (greater fitness) become more _____
- _____

Individuals DON'T evolve...

Individuals survive or don't survive...

Individuals _____ or don't...

Individuals are _____.

Fitness

Survival & Reproductive success

- individuals with one _____ leave more surviving offspring

Variation & natural selection

- _____ is the raw material for natural selection
 - o there have to be differences within population
 - o some individuals must be _____ than others

Where does Variation come from?

Mutation

- random changes to _____
 - o errors in _____ & _____
 - o environmental _____

Sex

- mixing of _____ (different versions of a gene)
 - o _____ of alleles
 - new arrangements in every offspring
 - o new combinations = new _____
- spreads variation
 - o offspring inherit _____

Agents of evolutionary change

1. Mutation & Variation

- Mutation creates _____
 - o new mutations are constantly appearing

- Mutation _____
 - o changes amino acid sequence?
 - o changes protein?
 - Changes _____?
 - changes _____?
 - o changes in protein may change _____ (physical characteristic) & therefore change _____

2. Gene Flow

- Movement of individuals & alleles in & out of _____
 - o seed & pollen distribution by _____.
- migration of animals
 - o sub-populations may have different _____
 - o causes _____ across regions
 - o reduce differences between populations

Human evolution today

- Gene flow in human populations is increasing today
 - o transferring alleles between populations

3. Non-random mating

- Sexual selection

4. Genetic drift

- Effect of _____
 - o _____
 - small group splinters off & starts a new _____
- _____
 - o some factor (disaster) reduces population to small number & then population recovers & expands again

Founder effect

- When a new population is started by only a few individuals
 - o some rare alleles may be at high frequency; others may _____
 - o skew the _____ of new population
 - human populations that started from small group of _____
 - example:
colonization of New World

Bottleneck effect

- When large population is drastically _____
 - o famine, natural disaster, loss of habitat...
 - o loss of variation by _____
 - alleles lost from gene pool
 - not due to _____
 - _____

Cheetahs

- All cheetahs share a small number of alleles
 - o less than 1% _____
 - o as if all cheetahs are _____

- 2 bottlenecks
 - o 10,000 years ago
 - Ice Age
 - o last 100 years
 - poaching & loss of habitat

Conservation issues

- Bottlenecking is an important concept in _____ of endangered species
 - o loss of alleles from gene pool
 - o _____
 - o _____

5. Natural selection

- Differential survival & reproduction due to _____
 - o climate change
 - o food source availability
 - o predators, parasites, diseases
 - o toxins
- combinations of _____ that provide “ _____ ”
 - o adaptive evolutionary change