

Genetic Drift Quiz Answer Key PDF

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Compare and contrast genetic drift and natural selection in terms of their effects on allele frequencies.

Genetic drift causes random fluctuations in allele frequencies, often leading to loss of genetic variation, while natural selection systematically increases the frequency of advantageous alleles, promoting adaptation to the environment.

What is the outcome of genetic drift over time in a small population?

- A. Increased genetic diversity
- B. Stabilization of allele frequencies
- C. Fixation or loss of alleles ✓**
- D. Increased mutation rates

Which of the following best describes genetic drift?

- A. A mechanism of evolution driven by natural selection
- B. A random change in allele frequencies in a population ✓**
- C. The introduction of new alleles through mutation
- D. The movement of alleles between populations

Genetic drift has the most significant impact on which type of population?

- A. Large populations
- B. Small populations ✓**
- C. Populations with high genetic diversity
- D. Populations with high mutation rates

In which situation is genetic drift least likely to occur?

- A. A small, isolated population

B. A large, interconnected population ✓

- C. A population experiencing a bottleneck
- D. A population founded by a few individuals

Which factors can lead to the occurrence of genetic drift? (Select all that apply)

A. Small population size ✓

B. Random mating ✓

- C. High mutation rates
- D. Environmental stability

Describe the founder effect and provide an example of how it might occur in nature.

The founder effect is a genetic phenomenon that occurs when a small group of individuals from a larger population establishes a new population, resulting in reduced genetic diversity and altered allele frequencies. An example is the Amish communities in the U.S., where certain genetic disorders are more common due to the limited genetic diversity of the founding population.

Which of the following scenarios would most likely lead to genetic drift?

- A. A stable environment with no changes
- B. A large population with high genetic diversity
- C. A small population with random mating ✓**
- D. A population undergoing strong selective pressures

Which of the following are true about the founder effect? (Select all that apply)

A. It can lead to reduced genetic variation ✓

B. It occurs when a new population is started by a few individuals ✓

- C. It is a result of natural selection
- D. It increases genetic diversity

Which scenarios could result in genetic drift? (Select all that apply)

A. A population experiencing a natural disaster ✓

B. A small group of individuals founding a new population ✓

- C. A population with a high rate of gene flow

D. A population undergoing strong selective pressures

Discuss the implications of genetic drift for conservation efforts in endangered species.

Genetic drift can significantly impact conservation efforts by reducing genetic diversity in small populations, making them more vulnerable to environmental changes and diseases, ultimately increasing their risk of extinction.

What is the founder effect?

A. A type of genetic drift occurring when a new population is established by a small number of individuals ✓

B. A process where alleles are lost due to natural selection

C. The introduction of new genetic material into a population

D. A mechanism that increases genetic diversity

Explain how genetic drift can lead to the fixation of alleles in a population.

Genetic drift can lead to the fixation of alleles in a population by causing random fluctuations in allele frequencies, which may result in certain alleles becoming more common and eventually reaching a frequency of 100%, while others may be lost entirely.

How does genetic drift differ from gene flow? (Select all that apply)

A. Genetic drift is random, while gene flow involves movement of alleles ✓

B. Genetic drift decreases genetic diversity, while gene flow can increase it ✓

C. Genetic drift occurs in large populations, while gene flow occurs in small populations

D. Genetic drift leads to allele fixation, while gene flow introduces new alleles ✓

Which event is an example of a bottleneck effect?

A. A small group of birds colonizing a new island

B. A large population experiencing a natural disaster that drastically reduces its size ✓

C. The migration of individuals between two populations

D. The development of a new mutation in a population

What is the primary difference between genetic drift and natural selection?

A. Genetic drift is a random process, while natural selection is not ✓

B. Genetic drift increases genetic diversity, while natural selection decreases it

C. Genetic drift only occurs in large populations, while natural selection occurs in small populations

D. Genetic drift requires environmental changes, while natural selection does not

Why is genetic drift more pronounced in small populations compared to large populations?

Genetic drift is more pronounced in small populations due to the greater impact of random sampling effects on allele frequencies.

Which of the following are potential consequences of genetic drift? (Select all that apply)

A. Loss of genetic diversity ✓

B. Fixation of alleles ✓

C. Increased mutation rates

D. Evolutionary change ✓

How might a population bottleneck affect the genetic diversity of a species? Provide a real-world example.

A population bottleneck can lead to reduced genetic diversity due to a sharp decrease in population size, which limits the gene pool. A real-world example is the Northern elephant seal, which experienced a bottleneck in the 19th century, resulting in low genetic diversity.

What are the characteristics of the bottleneck effect? (Select all that apply)

A. Drastic reduction in population size ✓

B. Increased genetic diversity

C. Loss of alleles ✓

D. Long-term population stability