



Study Prep

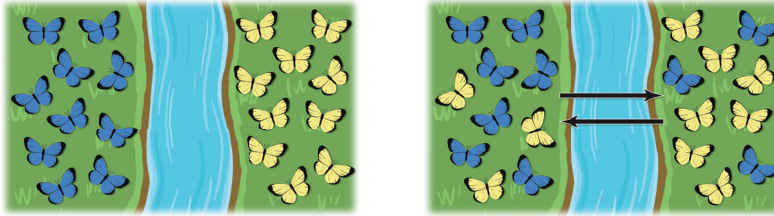
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TOPIC: GENE FLOW**Gene Flow**

◆ **Gene Flow:** movement of individuals (or gametes) between populations with different _____ frequencies.

- May introduce _____ alleles to a population.

Effect on allele frequency: _____
 genetic variation between 2 populations.

**EXAMPLE**

Isle Royale is a small island off the coast of Michigan's upper peninsula in Lake Superior. The island has a small wolf population that ranges between roughly 10 and 50 wolves, depending on the year. During cold winters, ice bridges form between the island and the Canadian coast, allowing for wolves and other animals to cross. Due to increased temperatures from global warming, ice bridges have been forming less frequently in recent years.



- Based on the wolf population size on Isle Royale, what evolutionary mechanism would you expect to be happening relatively rapidly there? _____
- Due to the small population, the wolves on Isle Royale are all closely related. How would you expect this to affect the fitness of the population? _____
- What evolutionary mechanism would the formation of ice bridges allow to occur that otherwise would be unlikely? _____
- How would your answer to C affect the mechanisms that were your answers to A+B?

- Imagine that you are a conservation geneticist. Propose a simple solution to maintain the fitness of the wolf population on Isle Royale if ice bridges no longer form between the island and the mainland.

TOPIC: GENE FLOW**PRACTICE**

To boost wild populations of fish such as Atlantic Salmon, scientists will sometimes breed fish in captivity and then release the fish into the wild population. Below, scientists measured the fitness of the wild fish, the captive-bred fish after being released into the wild population, and the first-generation offspring of wild and captive-bred fish. The fitness values are reported as relative values between 0 and 1. What description below best explains the data?

- a) The first-generation offspring of wild and captive-bred fish are likely less fit due to inbreeding depression.
- b) Gene flow into the wild population from the captive population has increased genetic variation in the wild fish; therefore, wild-caught fish now have the highest fitness.
- c) Wild populations likely have the highest population size and, therefore, are less subject to genetic drift, meaning they will have the highest fitness.
- d) Captive-bred fish are poorly adapted to living in the wild, and gene flow from captive populations into wild populations can be expected to reduce the overall fitness of the wild population.

