

SPECIATION & ISOLATION Practice

Geographic, Behavioral, and Temporal Isolation

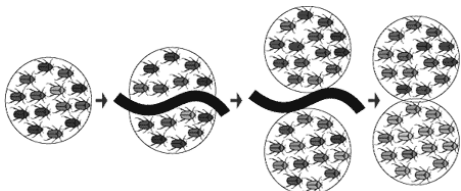
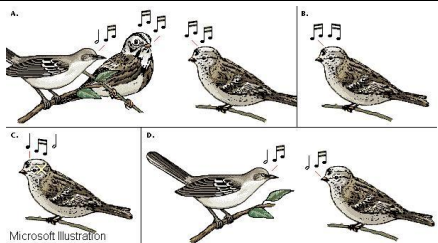

Name: _____ Date: _____ Block: _____

INTRODUCTION: How does one species become two species? Natural Selection and Genetic Drift can change the frequency of certain genes, causing a population to evolve within itself, but these processes do not lead to a brand new species by themselves.

SPECIATION is the process of **forming new species** from a species already in existence. Speciation requires that a population of that species **becomes isolated** from the original population. The original population splits into two isolated groups, which begin to breed among themselves, and genetic changes accumulate over time. Because the two populations no longer breed with each other, **reproductive isolation** has occurred.

REPRODUCTIVE ISOLATION occurs when two populations **no longer interbreed**. When reproductive isolation occurs, 2 separate species can arise since the gene pools are different. Over time, the two populations become so different that they can no longer mate with each other to produce **fertile** offspring, even if the isolation was removed. Thus, two new species are created.

There are **THREE WAYS** that reproductive isolation can occur:

Geographic Isolation	Behavioral Isolation	Temporal Isolation
<ul style="list-style-type: none"> When two populations become separate by physical barriers, such as rivers, mountains, or lake. Does not guarantee isolation for good, as the barrier may disappear, such as lacks being connected by a flood. 	<ul style="list-style-type: none"> When two populations become isolated by differences in courtship rituals or other behaviors. The populations may live in the same area, but do not breed with each other. 	<ul style="list-style-type: none"> When two populations become isolated because they reproduce at different times or patterns. For example, certain plants can theoretically breed with each other, but they flower at different times of the year.
		
<p>For example: Darwin's finches arose from a common mainland ancestor, but became isolated on different islands and evolved 15 separate species based on the different environmental conditions.</p>	<p>For example: The Eastern Meadowlark and the Western Meadowlark have different mating calls. Therefore, the females of each species do not respond to the mating calls of different males.</p>	<p>For example: The red legged frog's breeding season lasts from January-March. The closely related yellow legged frog's mating season lasts from March-May.</p>

DIRECTIONS: Read each description and choose the correct type of reproductive isolation it describes.

1. In the Great Lakes region of North America, gray wolves and coyotes are similar species but do not mate because their breeding periods occur at different times of the year.
 - a. Geographical isolation
 - b. Behavioral Isolation
 - c. Temporal Isolation
2. The females of two species of fruit fly, *Drosophila melanogaster* and *Drosophila simulans* release slightly different mating hormones called pheromones, which are used to attract male mates.
 - a. Geographical isolation
 - b. Behavioral Isolation
 - c. Temporal Isolation
3. A type of isolation in which two populations become separated by a physical barrier such as a canyon, river, lake, preventing the two populations from interbreeding.
 - a. Geographical isolation
 - b. Behavioral Isolation
 - c. Temporal Isolation
4. *Tradescantia ohiensis*, a plant also known as bluejacket and its relative, *T. subaspera* have similar reproductive mechanisms but do not mate, as one species lives in the sun while the other lives in the shade.
 - a. Geographical isolation
 - b. Behavioral Isolation
 - c. Temporal Isolation
5. A type of isolation in which two populations with complex courtship displays or rituals become different enough that they no longer respond to the other actions.
 - a. Geographical isolation
 - b. Behavioral Isolation
 - c. Temporal Isolation
6. The American toad (*Anaxyrus americanus*) and Fowler's toad (*Bufo fowleri*) live in the same area. However, the American toad mates in early summer while Fowler's mates in late summer.
 - a. Geographical isolation
 - b. Behavioral Isolation
 - c. Temporal Isolation
7. The flashing pattern of the firefly (*Lampyridae*) is used to attract the opposite sex. Female fireflies only flash back and attract male fireflies who first signal them with a species-specific pattern of light.
 - a. Geographical isolation
 - b. Behavioral Isolation
 - c. Temporal Isolation
8. A type of isolation where two species whose ranges overlap have different periods of sexual activity or breeding seasons.
 - a. Geographical isolation
 - b. Behavioral Isolation
 - c. Temporal Isolation
9. Albert's squirrel and the Kaibab squirrel are distinct subspecies that live on opposite sides of the Grand Canyon. They were once one species, but now differ significantly, including fur coloring.
 - a. Geographical isolation
 - b. Behavioral Isolation
 - c. Temporal Isolation
10. Of the seven species of cicada, three follow a 17-year mating cycle, while four follow a 13-year cycle. In regions where their geographic range overlaps, their emergence coincides once in every 221 years. This last happened in North America in 2015 and will not occur again until the year 2236.
 - a. Geographical isolation
 - b. Behavioral Isolation
 - c. Temporal Isolation