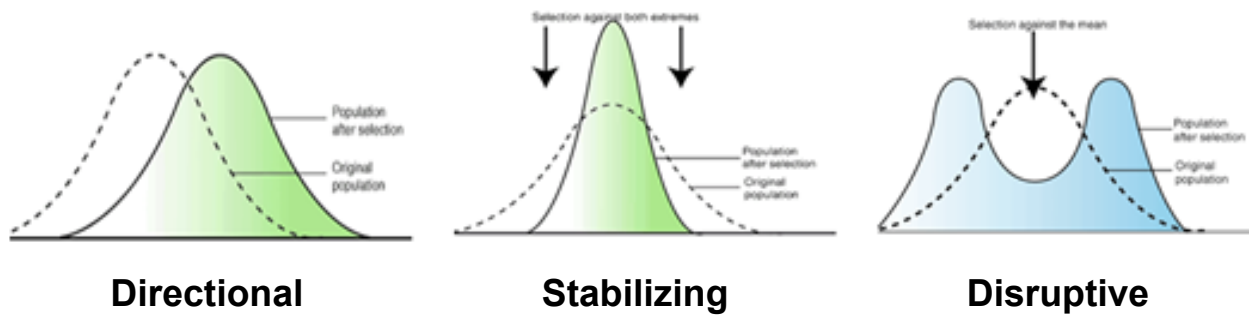


Name: _____ Period: _____ Date: _____

Selection Scenarios



For each scenario, identify the type of selection curve that is exhibited. Think about which individuals are the most **fit**.

1. A plant that is too short may not be able to compete with other plants for sunlight. However, extremely tall plants may be more susceptible to wind damage.
2. A plant population of extremely variable height that is pollinated by three different pollinators, one that was attracted to short plants, another that preferred plants of medium height and a third that visited only the tallest plants. The bee pollinators that preferred plants of medium height disappeared from an area due to insecticide use.
3. A group of early giraffes lives in a lush forest with many trees and shrubs of different heights to feed on. These giraffes have necks of various lengths, with most giraffes having a medium length neck. Then a blight passed through the area, killing off all of the low-growing shrubs.
4. A population of finches lives on an island with an abundant food supply. These finches have highly variable beak lengths, allowing them to feed on different types of food. Then several other species of birds move into the area, making food supplies scarce. The only types of food left for the finches are small seeds and nectar from long tubular flowers. Finches with small beaks can easily grasp and crack the seeds. Finches with long beaks can reach inside the long flowers to reach the nectar. However, some finches have beaks that are too large to deal with the small seeds, but too small to reach inside the flowers.

5. Corn originally had seeds that came off the cob and dispersed into the surrounding environment, thus propagating the species. Some plants, however, could not disperse their seeds due to a mutation; this mutation always ended that lineage of plants because the plant was effectively sterile. When humans discovered that corn could be eaten, they sought out the cobs that did not lose their seeds. Over generations, humans continually selected for the plants that did not lose their seeds, and therefore a strong selective advantage came to exist for those that were incapable of self-propagating.

6. A population of arboreal (tree-living) rodents lives in one species of pine tree. These pine trees have very evenly spaced branches of uniform thickness. Rodents that are too small cannot reach between the branches to move around in the tree. Rodents that are too big and heavy break through the branches and fall out of the trees. The rodent population contains adults of very uniform size.

7. Wild turkeys were domesticated so that we could eat their meat. Birds with greater amounts of breast and thigh meat were selectively bred. Over the generations, breast muscles became so large that the turkeys cannot breed naturally. However, humans use artificial insemination to keep these animals in the population.

8. Human birth weights tended to stabilize over generations when low-weight and heavy-weight babies died from complications. The average weight was between 6.5 and 8.5 pounds. Now, modern technologies, like Caesarean sections and NICU wings of hospitals have allowed many babies to live who would not have survived naturally.

9. A species of bird exists in which females prefer feathers on the crest of the head to heads without feathers.

- a. The crested males out-reproduce their uncrested counterparts, and crests become the norm over many generations. However, the females' preference may continue to tend toward more and more elaborate feathers - perhaps the ability to maintain attractive feathers is a good measure for a bird's overall health.

- b. Now, suppose further that overly elaborate feathers conferred a disadvantage in survival because the feathers impeded the bird's sight, or tended to attract fleas, or any other disadvantage.

10. What type of distribution curve would you expect for a trait in which there is no selection pressure?