Name: _____

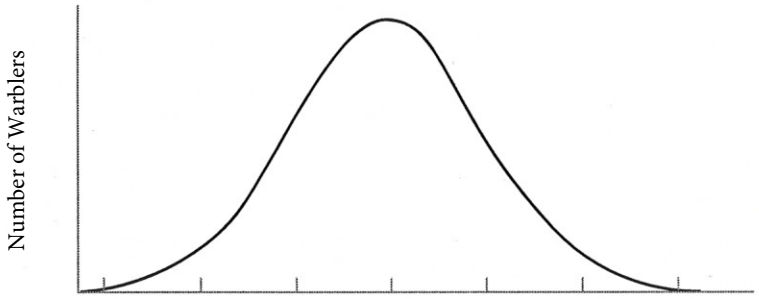
STUDENT PAGE

PRACTICE PROBLEMS

INSTRUCTIONS: For each of the following scenarios assume each population has continuous variation in the traits described below, the traits are genetically inherited and there is a great deal of genetic diversity in the populations. Initially assume the distribution of trait values in the population starts out in a normal distribution. Predict which pattern of natural selection would be most likely to occur based on the information provided. Draw the new populations in a different color on the graphs provided. Label both axes.

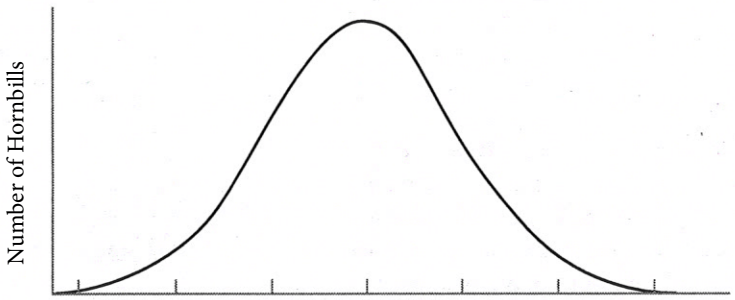
1. Fantail Warblers are birds that live in subtropical regions of Africa. The parasitic weaver (a lice like organism) is a specialist parasite of Fantail Warblers. However, parasite populations are declining due to climate change. Previously the birds with thicker feathers (which required more energy to produce) were more resistant to the parasitic weaver. As the effects of climate change increase what type of pattern of natural selection would we expect to see in the fantail warbler population with respect to feather thickness?

Type of Selection _____



2. A large population of southern yellow tailed hornbills is living in the Kalahari Desert. There are small amounts of rainfall and the summer temperature is very high. Yellow-billed hornbills are monogamous and will live in breeding pairs or small family groups. When they begin their courtship the male will feed the female for up to a month by bringing her small bits of food in his mouth. Females are attracted to males with richly pigmented feathers and less likely to choose a male with dull colored feathers. However, if the males have richer pigment they have trouble regulating their body temperature in warmer temperatures and often don't survive to adulthood. As the effects of climate change increase what type of pattern of natural selection could we expect to see in the southern yellowtail hornbill population with respect to amount of pigment in males?

Type of Selection _____



3. Fingered Poison Frogs are endemic to Trinidad. Females deposit small clutches of eggs in terrestrial nests. After hatching in July, one of the parents transports the tadpoles to a small water body, where they complete their development to metamorphosis. Suppose that due to changing climate conditions small bodies of water are only readily available during certain months of the year. Fingered Poison Frogs in southern Trinidad begin to only produce offspring during the spring months (April and May) and Fingered Poison Frogs in Northern Trinidad only produce offspring during the fall (September-October). What type of pattern of natural selection would we expect to see Trinidad's Fingered Poison Frogs population with respect to time of reproduction?

Type of Selection _____

4. A study was conducted on *Pocillopora damicornis*, a coral widely distributed in the Indo-Pacific. The study measured changes in reproductive timing associated with increased seawater temperature. In this study, the effect of increased seawater temperature on the timing of planula (free swimming coral larvae) release was examined during the lunar cycles of March and June 2012. Twelve brooding corals were removed from Hobihu reef in Nanwan Bay, southern Taiwan and placed in 23°C and 28°C controlled temperature treatment tanks. For both temperatures, the timing of planulation was found to be plastic, with the high temperature treatment resulting in significantly earlier peaks of planula release compared to the low temperature treatment. This suggests that temperature alone can influence the timing of larval release in *pocillopora damicornis* in Nanwan Bay. What pattern of natural selection would we expect to see in the *pocillopora damicornis* population if ocean temperatures continue to increases?

Type of Selection _____