Mechanisms of Evolution:

Evolution takes place when the allele frequencies (often abbreviated as p and q) change over time in a population. There are several processes that can causes allele frequencies to change.

As you learn about each mechanism, fill in the chart.	Definition	Effects on Genetic Variation	Effects on Population's Overall Fitness
Genetic Drift	Random fluctuation in allele frequency	Lowers genetic variation (small populations)	Usually lowers population fitness as populations are less able to adapt to environmental change.
Nonrandom mating (inbreeding)	Mating occurs between similar individuals	Lowers genetic variation (small populations)	Usually lowers population fitness (due to higher incidence of lethal alleles)
Mutation	New mutations arise in a population	Increases genetic variation	Can increase fitness if variety helps the population in the event of an environmental change.
Gene Flow	A population gets individuals from another population	Increases genetic variation (usually)	Can increase fitness if variety helps the population in the event of an environmental change.
Natural Selection (Negative selection)	Natural selection selects AGAINST one phenotype/allele.	Lowers genetic variation	Can increase fitness of population in that environment (but may be less able to adapt to change in future)
Natural Selection (Balancing Selection)	Natural selection supports both phenotypes/ alleles.	Increases genetic variation	Can increase fitness of population in that environment and help it adapt to future changes.

If allele frequencies change a lot, what can happen?

New distinct species can form, if a population changes so much that it can no longer reproduce with another population of its old species. This process is called Speciation.

Name: _____

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