**Mechanisms of Evolution**

**-Evolution occurs when the \_\_\_\_\_\_\_\_\_ in a population change.**

**Basic Mechanisms of Evolutionary Change:**

1. Mutations
2. Natural Selection
3. Genetic \_\_\_\_\_\_\_\_\_\_
4. Migration

**Mutations:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in DNA sequences that result from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ factors (Examples: radiation or chemicals) or just by chance.

**Genetic Drift:**

-A random \_\_\_\_\_\_\_\_\_\_\_\_\_ in allele frequencies that cause change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. By \_\_\_\_\_\_\_\_\_\_\_\_\_\_, some individuals leave behind \_\_\_\_\_\_\_\_\_\_ offspring than others. The genes of the next generation are the genes of the “\_\_\_\_\_\_\_\_\_\_\_\_\_” ones, not necessarily the healthier or better individuals. Examples: a beetle gets stepped on, a rabbit gets swept up by a tornado.

**Migration or Gene Flow:**

-When new \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ enter or \_\_\_\_\_\_\_\_\_\_\_\_\_ a population. As a result, the \_\_\_\_\_\_\_\_\_\_\_ frequencies change.

**Speciation**: A new species created.

-Species-a \_\_\_\_\_\_\_\_\_\_ of organisms that \_\_\_\_\_\_\_\_\_\_\_ with one another and produce \_\_\_\_\_\_\_\_\_\_\_\_\_ offspring.

**How Do New Species Form?**

1. Geographic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: occurs when a natural physical \_\_\_\_\_\_\_\_\_\_\_\_\_ separates a population and they evolve \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from each other. Examples-a body of water, landslides, deserts
2. Reproductive Isolation: occurs when formerly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ population can no longer breed and produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_ offspring. Geographic isolation can lead to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ isolation
3. Mechanical-\_\_\_\_\_\_\_\_\_\_\_\_\_\_ due to physical interference
4. Behavioral-\_\_\_\_\_\_\_\_\_\_\_\_\_\_ selection differences-preferring a mate over another
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-failure to create fertile offspring. Example-when a male donkey mates with a female horse, it creates a mule (infertile).
6. Time-two or more \_\_\_\_\_\_\_\_\_\_\_\_\_ reproduce at different \_\_\_\_\_\_\_\_\_\_ (aka temporal isolation)

**Patterns of Evolution**

-Divergent evolution-when animals evolve \_\_\_\_\_\_\_\_\_\_ from their common \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to become more successful in their \_\_\_\_\_\_\_\_\_\_\_

-Convergent evolution-when \_\_\_\_\_\_\_\_ or more distantly \_\_\_\_\_\_\_\_\_\_\_\_\_\_ organisms evolve similar \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because they occupy the same \_\_\_\_\_\_\_\_\_\_. The “fish” body form has evolved several \_\_\_\_\_\_\_\_\_\_ in very different organisms. Example-shark, dolphin

**Adaptive Radiation**

-Process by which an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ species evolves into a number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ species. It differs by \_\_\_\_\_\_\_\_\_\_\_\_\_, and occurs very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ unlike divergent evolution which takes many more \_\_\_\_\_\_\_\_\_\_ to occur.

**Coevolution-**organisms that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ but depend on each other and evolve \_\_\_\_\_\_\_\_\_\_ time.

**Rates of Evolution**

-Gradualism-evolution occurs slowly.

-Punctuated equilibrium-species stay the \_\_\_\_\_\_\_\_\_\_ for long periods of time with \_\_\_\_\_\_\_\_\_\_, sudden periods of evolution.

**3 Types of Natural Selection**

1. Directional Selection-one \_\_\_\_\_\_\_\_\_\_\_\_\_ will be “fit”. On a graph representing the population, the bell curve shifts to the left or \_\_\_\_\_\_\_\_\_\_. The best \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ will survive
2. Stabilizing selection-best adapted is still the \_\_\_\_\_\_\_\_\_\_ adapted. The two extremes die off and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ size will be more “fit”.
3. Disruptive selection-best adapted is now \_\_\_\_\_\_\_\_\_\_\_ adapted. The two extremes \_\_\_\_\_\_\_\_\_\_\_\_\_, and it causes the biggest environmental \_\_\_\_\_\_\_\_\_\_\_\_\_