**Notes Organizer for PPT Presentation: Mechanisms of Evolution**

“There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.”

*Charles Darwin*

**Which of the following statements about evolution is true?**

* 1. Populations evolve, people don’t
  2. Individuals evolve by changing the gene pool
  3. Individual evolve more slowly than populations
  4. Individuals evolve, populations don’t

**The founder of modern evolution theory is considered to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?**

* 1. Stephen J. Gould
  2. Charles Darwin
  3. Stan Laurel
  4. Alexander Oparin

How has evolution changed since Darwin?

Genetic information is used to explain the variation among individuals.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ evolve --- NOT INDIVIDUALS

Key Terms

**Gene Pool** – all the genes of a population put together is the “gene pool”.

**Genetic equilibrium** – when the frequency of an allele remains the same from generation to generation – EVOLUTION DOES NOT TAKE PLACE!

**Changes in equilibrium …**

*Any factor that affects the genes in the gene pool of a population will result in the process of evolution*.

**Mechanism for genetic change**(Disruption of equilibrium):

1. Mutations
2. Genetic Drift
3. Immigration / Emigration (gene flow)
4. Natural Selection

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can be caused by radiation, chemicals, or just by chance.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ is the alteration of allelic frequency by chance events.

Genetic drift greatly affects \_\_\_\_\_\_\_\_\_ populations

It can result in an increase of rare alleles in a small population (i.e. Amish)

**Movement In/Out of Population**

When an individual moves in and out of a population, (s)he also takes with them their \_\_\_\_\_\_\_\_\_\_ contribution.

This migration of individuals (with their genes) is called \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_.

**Natural Selection**

*Natural selection acts on variations*

Variations can increase OR decrease an individual’s chance of survival.

There are 3 types of natural selection that acts on variations:

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Stabilizing Selection**

Favors the “\_\_\_\_\_\_\_\_\_\_\_\_\_” individual in a population This type of selection \_\_\_\_\_\_\_\_\_\_\_\_ the variation in a population.

*Draw a picture here*→

**Directional Selection**

Favors one of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ variations of a trait and can lead to the rapid evolution of a population

*Draw a picture here*→

**Disruptive Selection**

Favors both extreme variations of a trait, resulting in no intermediate forms of the trait and leading to the evolution of two new species.

*Draw a picture here*→

**Evolution of Species**

The evolution of new species is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

It occurs when members of similar populations no longer \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to produce fertile offspring.

How does speciation occur?

Two main ways speciation occurs are:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Isolation

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ isolation

**Geographic Isolation**

Geographic isolation occurs whenever a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ divides a population.

**Reproductive Isolation**

Occurs when formerly interbreeding organisms can no longer mate and produce fertile offspring.

1. When the genetic material of the populations becomes so different that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cannot occur.
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – mating seasons, or other reproductive behaviors that isolate a group from another.

**Mutations**Change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ numbers and speciation.

Mistakes during mitosis or meiosis can result in \_\_\_\_\_\_\_\_\_\_\_\_\_individuals.

These are individuals or species with a multiple of the normal set of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

This may result in immediate reproductive isolation.

Because of the difference in chromosome numbers the offspring may not be able to \_\_\_\_\_\_\_\_\_\_\_\_\_\_ with “normal” individuals.

But they may be able to interbreed with similarly affected individuals and form a new \_\_\_\_\_\_\_\_\_\_\_\_\_.

**Speciation Rates**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – species arise through a gradual change of adaptations.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Equilibrium

Speciation occurs relatively quickly, in rapid bursts, with long periods of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in between.

**Patterns of Evolution**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Radiation – When an ancestral species evolves into an array of species to fit new niches.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Evolution**

Species that were once similar to an \_\_\_\_\_\_\_\_\_\_\_\_ species become increasingly distinct.

Occurs when populations change as they become adapted to different \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Convergent Evolution**when \_\_\_\_\_\_\_\_\_\_\_\_\_\_ organisms occupy similar environments in different parts of the world and take on similar \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.