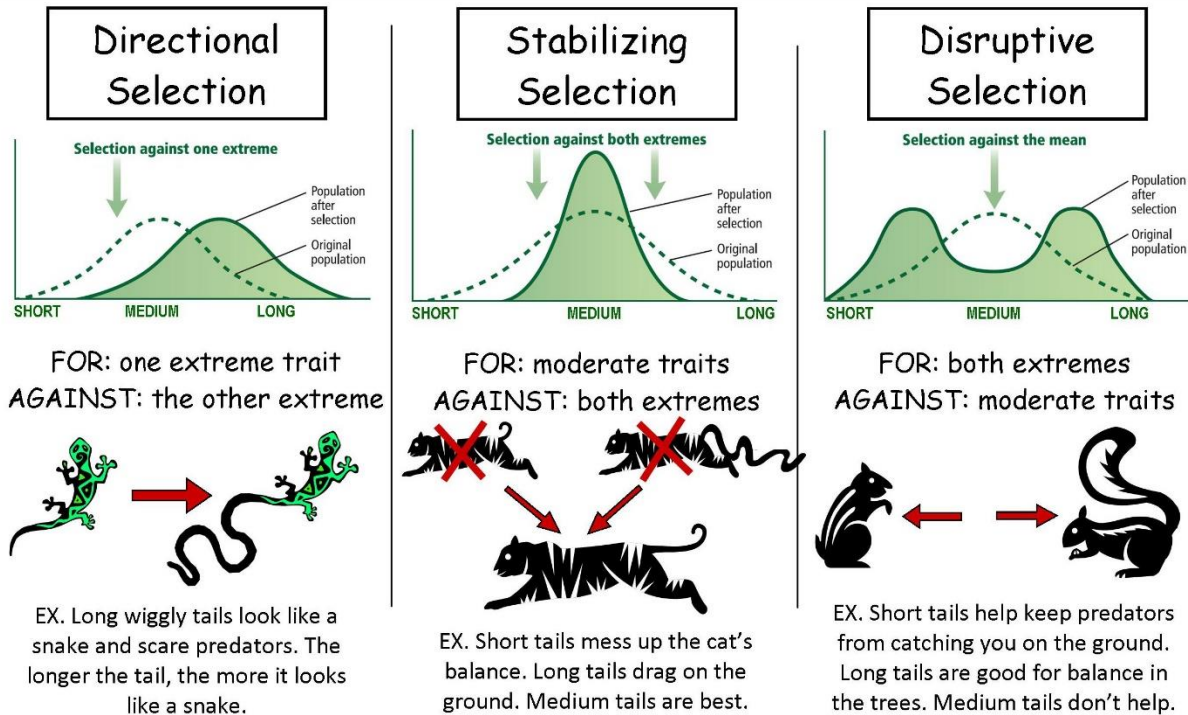


Types of Natural Selection

Have you ever wondered why the appearance of a species may look slightly different when found in different areas? Environmental pressures may cause populations to change over time due to their environment but not enough to form a new species. This is because an organism's ability to survive in its current environment to adulthood and reproduce will be the one to pass on its genes. And their genes will become more prevalent. Below are three different types of Natural Selection. Study the images and descriptions.

HOW does the trait change?



Directional favors one extreme of the population

Stabilizing favors the average in the population

Disruptive favors opposite extremes of the population (this can eventually lead to the development of two separate species).

If you start with a population of mice that have approximately the same number of solid black, solid gray and solid white mice but at the end of two years there are mostly black mice left, what type of selection occurred?

What type of selection occurred if at the end of two years there are very few gray but many solid black and solid white mice left in the population?

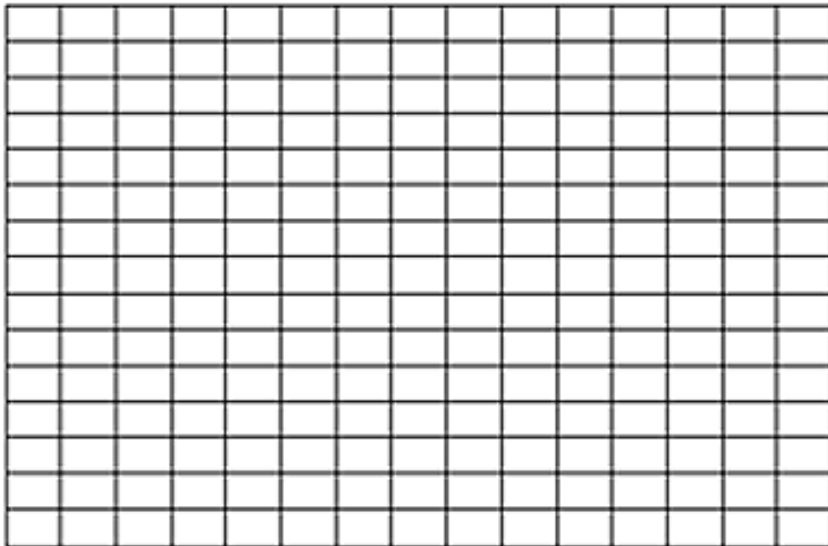
What type of selection occurred if there were mostly gray mice left after two years and only a few solid white and solid black?

TYPES OF SELECTION

A group of snakes were all placed into environments that had differing selective pressures. Read the data tables below and graph each snake in its environment. From the graph, determine what type of selection is being portrayed: directional, stabilizing or disruptive.

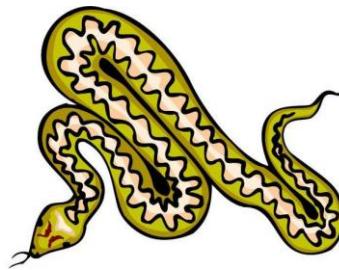
- Snakes placed on an island where there are two predators that eat snakes.

		Number of Snakes at Each Length				
		2 cm	4cm	6 cm	8 cm	10 cm
Year	1980	2	14	18	12	4
	1984	4	12	8	9	8
	1988	10	6	3	6	14



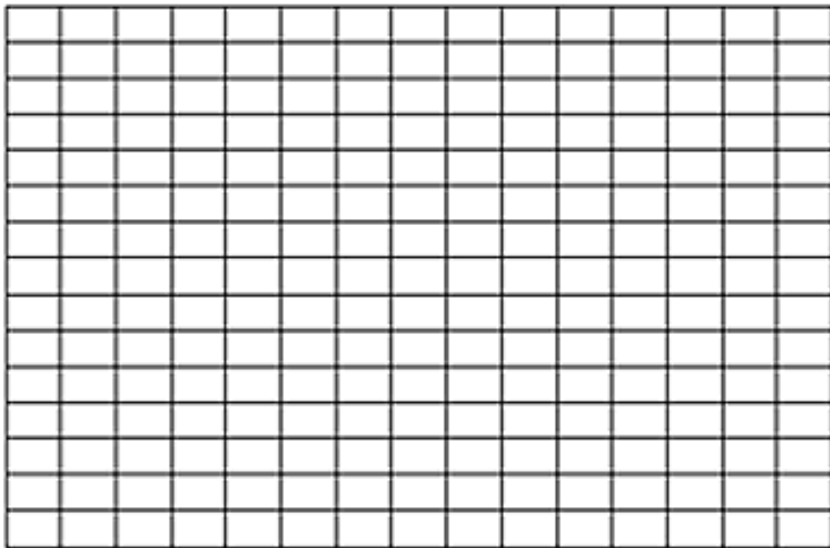
Type of Selection:

Summarize what happened to the snakes.



- Snakes placed on an island where there is only one size of burrow available to the snakes to live in.

		Number of Snakes at Each Length				
		2 cm	4cm	6 cm	8 cm	10 cm
Year	1980	4	12	16	10	3
	1984	3	10	18	9	3
	1988	1	6	24	2	1

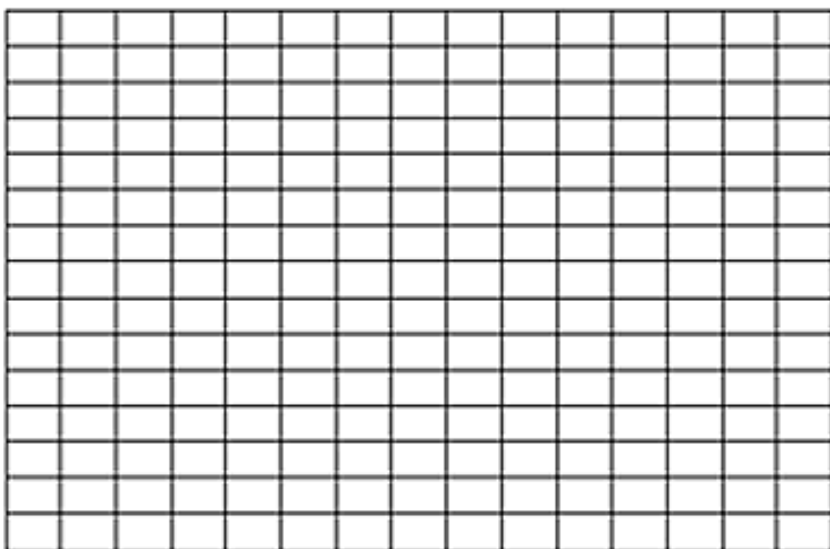


Type of Selection:

Summarize what happened to the snakes.

3. Snakes placed on an island where there is only one predator, a snake eating toad. This toad can only eat snakes under 6 cm long

Number of Snakes at Each Length						
		2 cm	4cm	6 cm	8 cm	10 cm
Year	1980	4	12	14	8	12
	1984	2	6	9	12	14
	1988	1	2	2	15	18



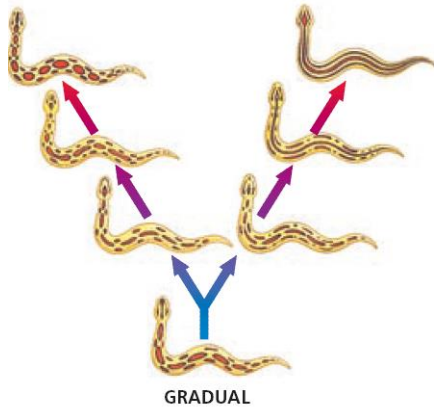
Type of Selection:

Summarize what happened to the snakes.

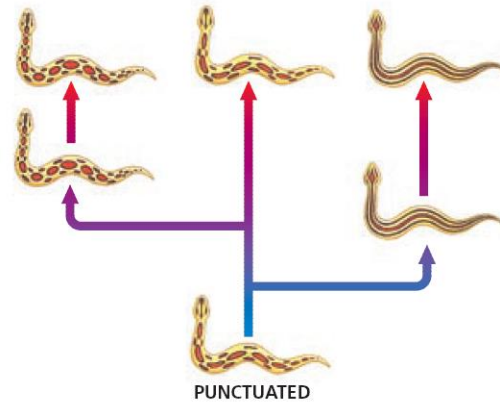
Types of Evolution: Punctuated Equilibrium vs Gradualism

Use the information below AND YOUR NOTES to answer the questions that follow. READ the information before attempting to do the work. You may need to refer to this information often.

GRADUALISM

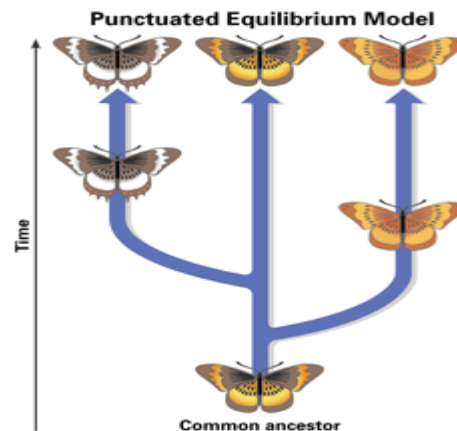
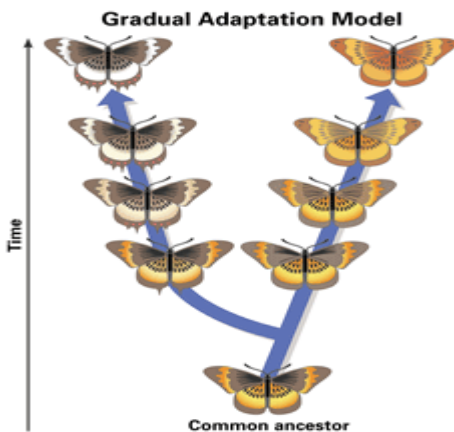
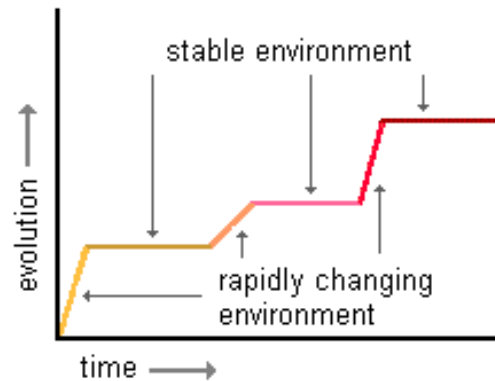
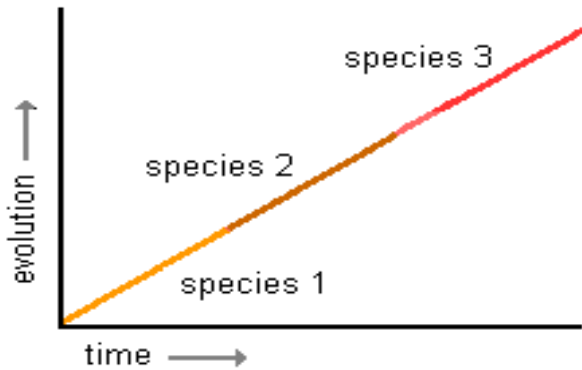


PUNCTUATED EQUILIBRIUM

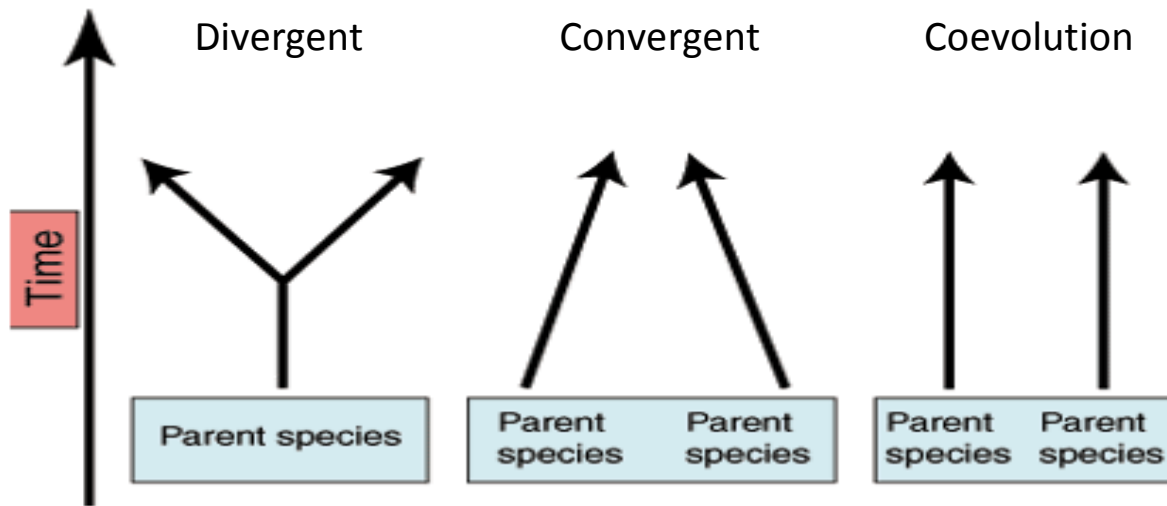


Gradualism - Natural selection gradually changes the average features of a species. This process continues for long enough for a species to change into a new species and the original species becomes extinct.

Punctuated Equilibrium - periods of rapid speciation followed by long periods of stasis –no change.



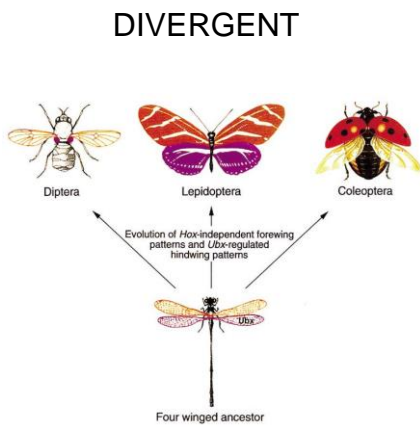
Types of Evolution: Divergent, Convergent & Coevolution



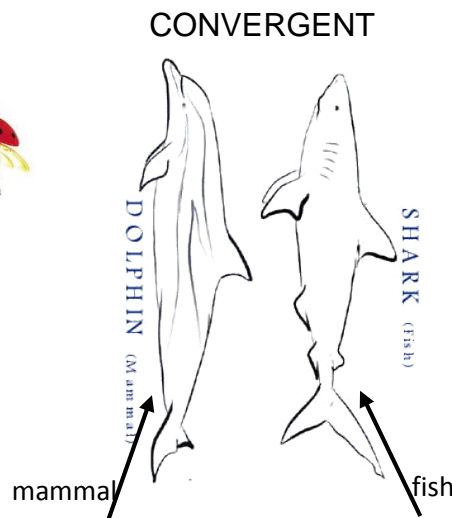
Divergent – ONE species evolves into two different species.

Convergent – TWO separate species in different areas evolve to look or behave in a similar manner

Coevolution – TWO species that have a partnership or symbiotic relationship evolve together to continue the relationship



Results in Homologous Structures



Results in Analogous Structures

COEVOLUTION



As the flower evolved over time, the pollinating partner the fly, evolved along with it to maintain the relationship.

TYPES OF EVOLUTION

Directions: Read each description below and choose which of the four types of evolution it is by placing an X under the correct answer for each description.

For convergent evolution and divergent evolution ONLY, use the key to record if the scenario is describing a homologous, vestigial, or analogous structure. Record in the box under the "X".









H = Homologous structure

V = Vestigial structure

A = analogous structure

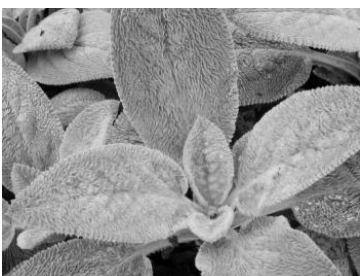
	Description	Convergent evolution	Divergent evolution	Coevolution	Punctuated equilibrium
1	In the ocean surrounding Antarctica, there are fish that survive the cold water by using a molecule made of glycoproteins that circulates the blood and keeps it from freezing. Certain kinds of worms that live in the Arctic ocean also make antifreeze proteins that help them live in icy water.				
2	Horse evolution shows long stable periods of little evolution interrupted by brief periods of rapid change.				
3	Hummingbirds have a beak just the right length to reach the nectar in a cardinal flower and as they feed their foreheads bump into the pollen structure. Cardinal flowers are red which hummingbirds can see but bees can't. Cardinal flower's pollen structure is just the right length for the hummingbird to pick up pollen as it feeds.				
4	Ostriches are native to the savannahs of Africa, while penguins live in the polar regions. Although ostriches and penguins are closely-related, they look very different				
5	The <i>Galloti atlantica</i> and <i>Galloti galloti</i> lizards evolved through natural selection from a common ancestor into a wide variety of different looking lizards.				
6	Whales, sharks, and penguins all have streamlined bodies and fins/flippers for moving in water even though they belong in different classes of animals (mammals, fish, and birds).				

Are the following pairs of animals examples of convergent or divergent evolution?

		Convergent	Divergent
	and		<input type="checkbox"/> <input type="checkbox"/>
	and		<input type="checkbox"/> <input type="checkbox"/>
	and		<input type="checkbox"/> <input type="checkbox"/>
	and		<input type="checkbox"/> <input type="checkbox"/>

An adaptation is any characteristic that increases fitness, which is defined as the ability to survive and reproduce. Match the following adaptations to the correct organism.

- _____ This plant lives in a dry, temperate forest and is in danger of losing too much water through its stems. It also wants to ensure that it could survive a natural disaster like a fire or parasite infestation.
- _____ This plant likes to grow in an upward direction and will often grow on other plants. Due to its length it must have a way to hold on as it grows so it does not fall.
- _____ This plant lives on the sand dunes of many beaches. It must be able to survive in direct sunlight by developing some type of sunscreen. It also has developed a way to collect water on its leaves so it can use the morning dew for hydration.
- _____ This plant grows along the muddy shores and in shallow water. It needs a way to stay upright and balanced in the waves as well as keep its trunk from becoming too saturated.



Fine hair on leaves



Thick bark



Stilt roots



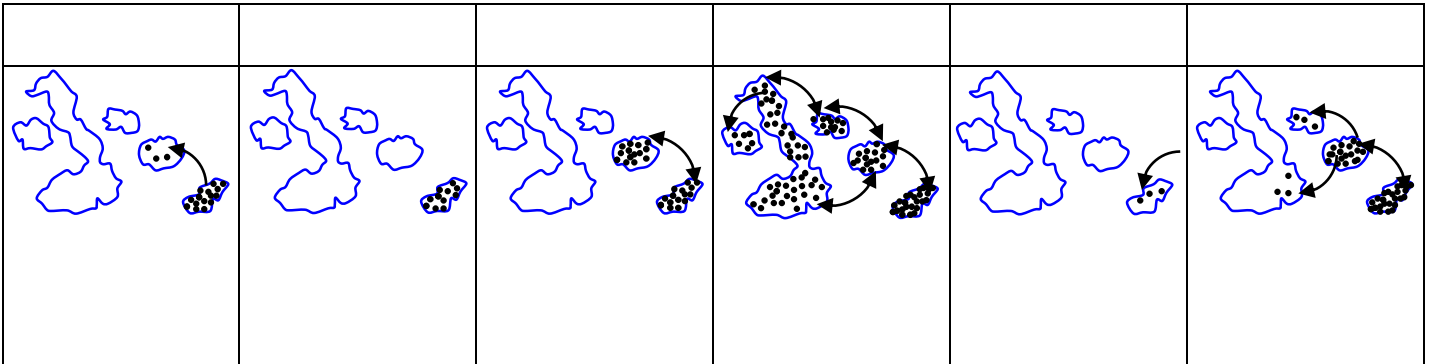
Tendrils

SPECIATION IN GALAPAGOS ISLAND FINCHES

While visiting the Galapagos Islands located about 600 miles off the northwest coast of South America, Charles Darwin counted 13 species of finch. In addition to size and other characteristics, he noticed that each had a slightly different shaped beak. Darwin observed that the birds on the Galapagos Islands had some similarities to the finches on the South American mainland. Darwin theorized that perhaps there was a common ancestor that came over to the Galapagos Islands from the mainland for all of the different species of finches on the islands. Darwin's observations of the various finches and of the environment of the islands, helped him formulate his theory of natural selection. The adaptive radiation and speciation of the Galapagos Island finches also shows the effects the geographic isolation mechanisms operating in the islands.

1. Define species. _____
2. Define speciation. _____
3. Define reproductive isolation. _____
4. Table #1 contains diagrams representing the events of finch migration through the Galapagos Islands. Sequence the diagrams to show in the correct order of finch migration. Table #1 also contains statements that describe the events of finch migration through the Galapagos Islands. Sequence the statements to describe the correct order of finch migration.

TABLE #1: Number the Diagrams in the Correct Sequence



Number the Statements below in the Correct Sequence

The finches increased in numbers and, under influence of natural selection, gradually became adapted to the local environment.	Some managed to fly back to the first island but reproductive isolation had occurred between them and the existing population.	Originally, there were no finches on the islands. Some finches from the mainland managed to fly across to them.	Some of the finches managed to fly to a second island where the environment was different. Gradually they adapted to the conditions on the second island.	This process was repeated over and over again as the finches colonized more of the islands.	Some finches managed to fly to other islands where the environment was different. Adaptation to the new conditions gradually took place

5. Describe speciation of the Galapagos Island finches in terms of geographic isolation. _____

Get signed off before moving on. _____