Evolution of Populations Name: KEY Date:

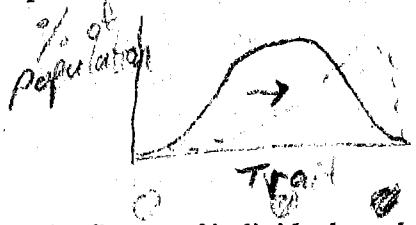
1. Explain how natural selection led to thirteen species of Galapagos finch developing from one common ancestral finch on the mainland of Ecuador. An example diagram would help!

Mainland finches moved to new volcanic islands. Each island had different food sources which caused the selective pressure on variations of bird beaks which were not well adapted to the environment. Birds with well adapted beak shapes mated and passed on their favourable traits.

Hard shelled nut food source

Insect in tree food source

2. What is directional selection? Explain and sketch a graph.

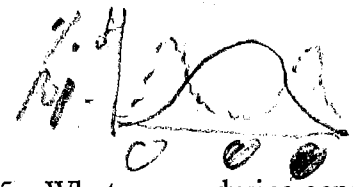


One extreme variation is favoured over the average, causing the extreme variation to become more common.

3. In stabilizing selection, how does the fitness of individuals at the center of the curve differ from the individuals at either end?

Fitness of individuals at centre of the curve are more fit than individuals at either end.

4. How does disruptive selection result in two distinct phenotypes (distinct looking organisms)?



Both extreme variations are favoured while average trait is selected against.

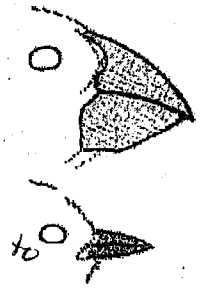
5. What occurs during genetic drift?

Change in gene pool as a result of random events. A more serious problem in small populations.

6. Explain what happens in gene flow.

Transfer of genes from one population to another which can introduce new variations.

7. You examine these two beaks: One is narrow and needlelike. The other looks like a pair of pliers. What type of natural selection could have produced birds with these two extreme types of beaks? Explain your answer.



Natural selection → divergent evolution
Different selective pressures such as environment and food source leads to distinct phenotypes.
Disruptive selection → two distinct phenotypes formed.

Name _____ Class _____ Date _____

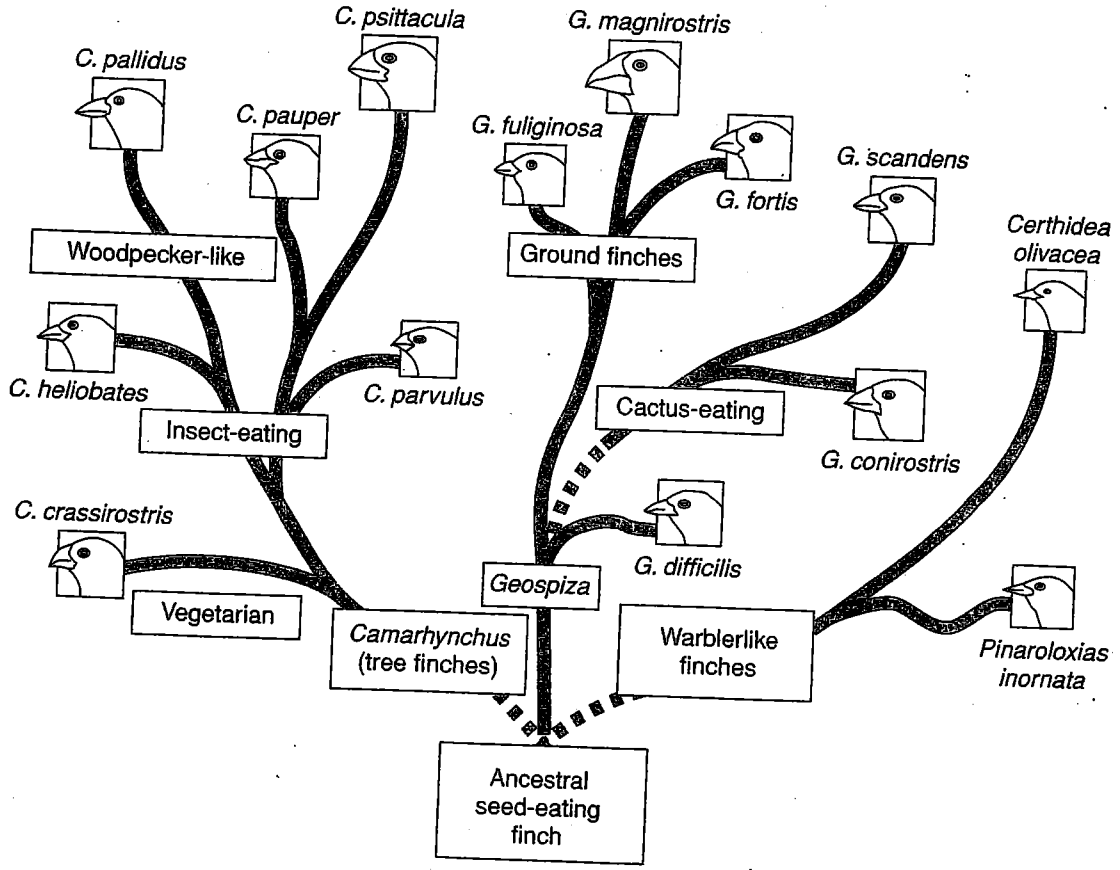
A Close Look at Darwin's Finches

When Charles Darwin traveled to the Galápagos Islands, he found a variety of species of finches. Although each species was slightly different from the others, all the species were related. None of the finch species he found were similar to finches on the mainland.

When Darwin saw such extensive diversity of species in a single group of birds, he hypothesized that they all could have descended from a common ancestor. His observations of these finches helped him formulate his concept of evolution.

The phylogenetic tree below shows the relationships Darwin proposed among the species of finches. The tree is based on a comparison of the anatomy, behavior, and location on the island of each finch species. Look carefully at each species, and notice the dramatic difference among the beaks. Each type of finch has a beak adapted to its diet.

Darwin's finches are an example of adaptive radiation. Adaptive radiation is the emergence of many species from a common ancestor that was introduced to various new environments. For adaptive radiation to occur, the new environments must offer new opportunities and pose new problems of survival for the species.



Evaluation

1. Which of the ground finches illustrated above would be able to eat the largest, toughest nuts and seeds? Explain your answer.

G. magnirostris → Big strong beak - wide

2. Study the insect-eating finches shown in the diagram. What can you infer about the insects of the Galápagos Islands?

Some live in trees.

5 different species of finch evolved so variety of insect food sources → different sized bugs, habitat etc...