

**Review Sheet/NYS Regents Lab Activity #3
The Beaks of Finches (Union-Endicott CS review sheet revision)**

Important Terms

Variation
Adaptation
Migration

Competition
Environment

Struggle for Survival
Selecting Agent

Key Points

1. Species evolve over time. Evolution is a result of the interactions between:
 - a. The potential for a species to **increase** its population
 - b. Genetic **variation** of offspring due to mutation and genetic recombination.
 - c. A **limited** amount of resources in the environment (ex. food, space, mates, etc.)
 - d. Selection by the environment of those individuals that are better able to survive and produce viable offspring (“survival **of the fittest**”)
2. Some characteristics / variations give individuals an advantage over others in surviving and reproducing. The offspring of these “better adapted” individuals will be more likely to **survive** and reproduce than those of other individuals. The proportion / frequency of individuals with favorable characteristics will increase.
3. Variation in a population increases the likelihood that at least some individuals will **survive** the changing environmental conditions.

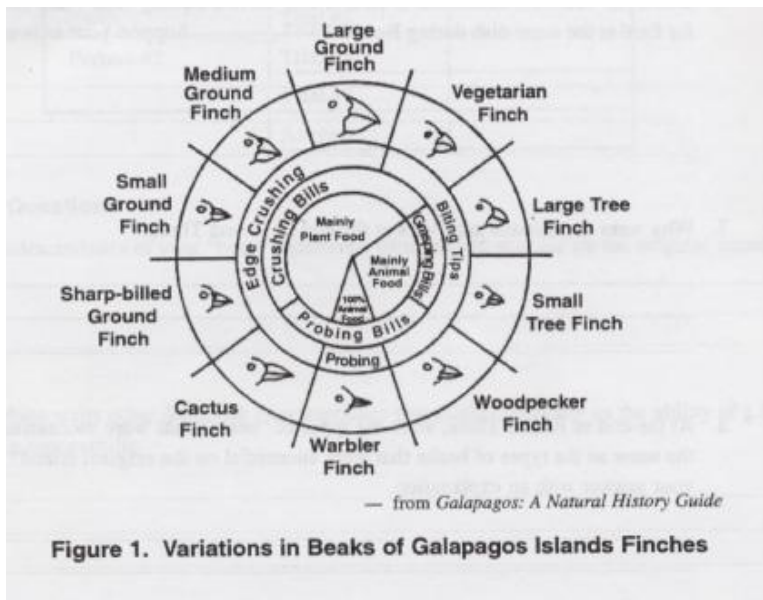
Procedure

1. In teams of two, students will simulate foraging for food by finches in an island environment.
2. The **beak** variations of finches will be represented by a variety of tools (tweezers, spoons, pliers, etc.)
3. In Round One, students simulate feeding on **small** seeds. Each student will remove seeds alone, without **competition** from other students.
4. The winners of Round One stay on their original island while the losers migrate to a different food source (**large** seeds). In Round Two, the same procedure will be followed.
- 5.
6. The winning teams proceed to Round Three and the losing teams are eliminated.

7. In Round Three, all surviving teams feeding on large seeds will feed from the same tray of seeds at the same time. All surviving teams feeding on small seeds will feed on the same tray of small seeds at the same time. The purpose of round three is to simulate increased **competition**.
8. The winning teams of from Round Three will possess the beak variation that is **best** fit for feeding on that particular type of seed.
9. All trials in each round run for the same length of time. Only those seeds that are successfully removed are counted.

Analysis

1. **Competition** for food should have had an adverse effect on feeding success.
2. There were **fewer** survivors at the end of Round Three due to increased competition.
3. The following components of Natural Selection were simulated:
 - a. **Variation**: different beaks, different size seeds
 - b. **Competition**: more than one bird feeding at one bowl
 - c. Struggle for **survival**: each bird trying to get enough food to survive
 - d. **Adaptation**: particular characteristics of “beaks”
 - e. **Environment**: students, seeds, dishes are part of environment
 - f. **Selecting agent**: type of “beak” and / or type of seed available



*** Be sure you study the diagram to the left that shows the variations in beaks of Galapagos Island finches. The diagram represents the types of beaks, the function of the beaks, and the type of food the finches eat.**