Name: Date: Block:

 Charles Darwin observed in his journal that finches living on different Galapagos Islands had different beaks. He also observed that the environment on each of four islands was quite different from the environment on the other three islands; in particular, the type of food available to finches was different on each island. He developed a hypothesis that the finches had all been the same at one time, (probably blown over from the coast of South America), with some variation in their beaks which made some beak types more adapted to the food on each island and so the birds with those beaks survived and reproduced and others did not on that particular islands with its particular type of food.

These are one example of four different types of beaks found in finches living in the four different islands.



Island #1 –The first island on our journey has a tropical climate and an abundance of larger fruits.

Island #2 –The second island is a temperate and has many trees that grow medium-sized hard nuts. Any bird that’s going to have a meal must have a hearty beak to crack them.

Island #3- The third island has a temperate climate and many berry bushes. The fruits that grow here are small, but abundant.

Island #4- The final island on our journey has a very dry climate and little vegetation (just some low growing shrubs). The birds that live on this island must subsist on a diet of worms, which are snatched straight out of the dirt.

**Materials:**

Set of Finch Beaks: Salad tongs, tongs, tweezers, probe

Island Food Source: large fruit, nuts, small fruit, worms

**Procedure:**

You and a partner are to visit each of the four Galapagos Islands!

In your explorer knapsack, you happen to have a set of four bird beaks that are found in the Galapagos Finches. It is up to you to figure out which of the four beaks is best suited for the food that is available on each island.

Determine the beak of best fit by using each of the beak types in an attempt to retrieve the food on the island. But be careful! **Each beak can only be used once**, so while a beak that gathers and breaks nuts *might not be able to dig out a worm, it may not be the beak that is best suited for the task.*

**Put a check mark in the box od the beak type that best corresponds to each island’s food source.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Salad Tongs** | **Tongs** | **Tweezers** | **Probe** |
| **Island #1** |  |  |  |  |
| **Island #2** |  |  |  |  |
| **Island #3** |  |  |  |  |
| **Island #4** |  |  |  |  |

**Discussion:**

Birds’ beaks are the tools they have to use to gather food. The best adapted (fittest) to the available food have the best chance of surviving (not starving to death) and of having offspring. The different variations in these beak forms are each an experiment in natural selection. Only the fittest variant for the beaks will survive in this struggle for life. In this way, each beak is *selected* by nature.

These birds must have been separated geographically from each other for a long time. The place where they each lived must have different types of food, and since no two living beings are exactly alike, the ones with better beaks for the available food would have done better and had more descendants with this inherited beak type. In these descendants there would have been a selection at each generation towards the better beaks in the population.

Over time this selection would lead towards a better specific inherited beak type. This is how “survival of the fittest” or natural selection operates-through the interaction of the environment and genetic heredity.

**Reflection:**

1. What role did the process of natural selection play in the observation of the various beak types of the Galapagos Finches.
2. All of the finches on the Island are descended from the same type of Finch, but are now different species with different appearances. The finches were geographically separated (on different islands) and adaptations that were better suited to the available food source were selected for.

I want you to take the example and apply it to the discussion we were having in class recently about human skin color. If all modern humans originated in Africa (circa 200,000 yrs), why do humans now have so many variations in skin color? Compare skin color variation to variations in Finch beaks. **Feel free to use another paper to answer this question.**