Name: _____ Date: _____ Period: _____

Battle of the Beaks Week #_____

While visiting the Galapagos Islands located off the northwest coast of South America, Charles Darwin counted 14 different types of finches. In addition to other characteristics, he noticed that each had a slightly different shaped beak. Darwin observed that the finches on the Galapagos Islands had some similarities to the finches on the South American mainland. These observations eventually lead him to the concept of **natural selection**. In this activity, we will simulate the differences in finch beaks in an attempt to understand Darwin's theory of natural selection.

Directions: In this simulation, you will be a finch fighting for a resource- food. Your classmates will simulate other finches with slight variations in the shape of their beaks.

1. Examine the beaks and the corresponding tools in Figure 1. What type of tool do you think will be most successful in this simulation? Explain your answer.

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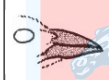
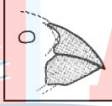
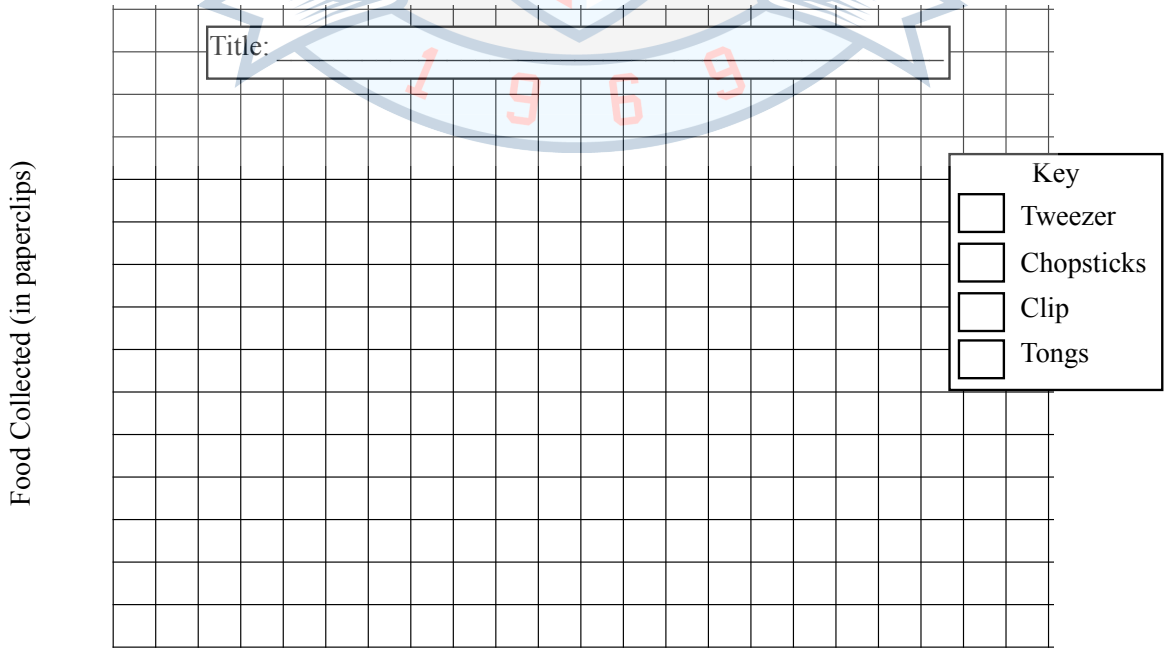
Beak		Amount of Food Collected (in paperclips)			
Shape	Tool	Year 1	Year 2	Year 3	Year 4
	Tweezer				
	Chopsticks				
	Clip				
	Tongs				

Figure 1

Directions: Create a line graph to illustrate the amount of food collected by each bird over time.



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2. If the amount of food collected determines survival, which bird had the best chance of survival?

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3. If the feeding patterns continue, predict what will happen to the population of each type of finch.
   a. Tweezer Birds: _____
   b. Chopstick Birds: _____
   c. Clip Birds: _____
   d. Tong Birds: _____

4. Assuming that reproduction occurs, predict what the population of finches will look like in 20 years.

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5. Darwin's observations of the finches helped formulate his theory of natural selection. Based on the simulation in class, what do you think Darwin meant by the phrase "natural selection"?

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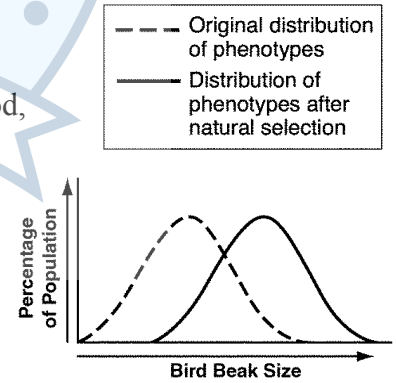
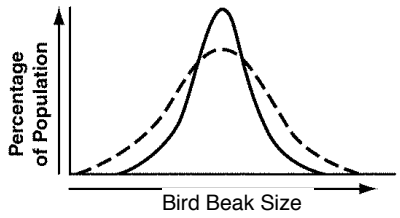
Directions: We have just simulated how populations can change over time. The following three graphs illustrate such change in populations due to natural selection. Analyze each graph and determine which explanation best fits the data.

6. (IOD 403) A flood occurred that caused the food supply of finches to be affected. Prior to the flood, most finches had medium sized beaks, which allowed them to easily collect seeds and nuts on the ground. After the flood, food on the ground was no longer available. The only way to obtain food was to pick tiny small insects out of the tree bark, or to use strong breaks to break large pieces of bark off the trees to collect and consume the insects. Which graph illustrates how the finch population changed as a result of the flood?



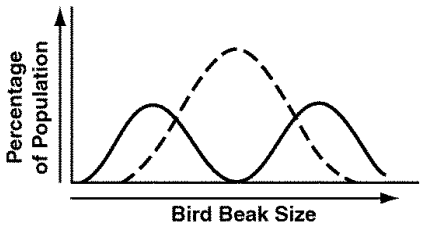
Graph A

7. (IOD 403) All finches, regardless of beak size, eat seeds on this island. Most finches have medium sized beaks, with a few having small and large beaks. A spring with less rain than normal results in seeds with harder shells to crack. With this trend continuing for the next 5 years, the average size of the finch beaks have gradually increased.



Graph B

8. (IOD 403) An island recently experienced a drought that immediately reduced the population of small insects living in tree bark. Finches with small beaks that could pick insects out of bark, and finches with large beaks that could break the bark off the trees, have suffered from this disappearance. The next five years continued with less rainfall than normal. The finches that were less affected by this drought were those with medium sized beaks.



Graph C