Introduction:

Charles Darwin came up with the idea of Natural Selection based on what he and other scientists saw in the world. Natural Selection is the idea that the environment an animal lives in helps to determine which animals survive and produce the most offspring (have the highest "fitness") and which do not. When Darwin was the naturalist on the H.M.S. Beagle his job was to make observations on the plants and animals he found in the places the ship docked. While on the trip, Darwin saw many strange and new plants and animals and began to wonder how they could have come to be. He was particularly struck by the animals of the Galapagos Islands, where he found that each island had a different kind of finch.

In any habitat, food is limited and the types of food available may vary. Animals that have variations that enable them to take advantage of available foods will be more likely to survive. We call beneficial inherited variations "adaptations". Adaptations are inherited characteristics that increase an organism's chance for survival. Those with the most helpful adaptations will be the most likely to live long enough to pass on their genes to the next generation. This process ensures that beneficial adaptations will continue in future generations, while disadvantageous ones do not. In this lab you will investigate different shapes of bird beaks along with different types of food sources and evaluate the relative "fitness" of birds who have each type of beak.

Materials:
Bird "beaks": Spoons, forceps, chop sticks, clothes pins
Food sources: rice, yarn pieces, dry beans, dry macaroni
plastic cups, lab trays

Predict: Make a prediction that states which will be the best type of bird beak for each type of food and explain why you think that.

Food type	Best bird beak for food type	Why?
Dry rice		
Yarn		
Dry beans		
Dry macaroni		

Procedure:
1. Each person in the lab group needs to choose a different "beak" to use for the activity. Each person also needs a plastic cup to act as your "stomach".
2. You are a very hungry bird. The tool you selected will act as your "beak". You can only use your beak to pick up food and put it into your stomach.
3. Your cup (stomach) must remain upright at all times. You must hold your beak in one hand, and your stomach in your other hand, close to your body. Only food items that are placed in the cup by the beak will be considered eaten. YOU MAY NOT SCOOP OR THROW FOOD INTO YOUR CUP.

4. Food items will be placed in your "habitat", your lab tray. When the teacher says go, you will have 30 seconds to feed, or until the food source runs out. Collect as much food as you can into your stomach as possible until time runs out.
5. After the teacher says stop, dump the contents of your cup onto the lab table and count how many food items you successfully ate. Record the data.
6. Repeat for each of the other food items.

Data table:

Lab group data

Beak type	Dry rice	Yarn	Dry beans	Dry macaroni
Spoon				
Forceps				
Chop sticks				
Clothes pin				

Class data (actual)

Beak type	Dry rice	Yarn	Dry beans	Dry macaroni
Spoon				
Forceps				
Chop sticks				
Clothes pin				

Class data (average)

Beak type	Dry rice	Yarn	Dry beans	Dry macaroni
Spoon				
Forceps				
Chop sticks				
Clothes pin				

Conclusion:
1. Which type of beak is better adapted to each type of food and why?
2. Which type of beak was least adapted to each type of food and why?
3. How does the shape of a bird's beak affect how it survives?
4. Would you change your feeding strategy if you had another opportunity to "feed"? Explain.
5. What would happen if all the bird types in this activity flew to an island where no birds had been before and the only food available was dry macaroni? Which birds would be most successful? Which would be least successful? Explain.
6. If you came back to this island (from #5) in 50 years, what type of birds would you expect to see living there?
7. How does this lab provide support for the Theory of evolution by Natural Selection?