

## Battle of the Beaks Lab

### Purpose

To learn about the advantages and disadvantages of variation in populations, by simulating birds with different types of beaks competing for various foods.

### Background

In any habitat, food is limited and the types of foods 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 of survival. Those with the most helpful adaptations will be the most likely to live long enough to pass on their genes to the next generations. This process ensures that beneficial adaptations will continue in future generations, while disadvantageous characteristics will not. Understanding the concept of adaptive advantage is absolutely required for an understanding on how populations exist in ecosystems as well as the process of evolution.

### Hypothesis

Read the procedure before making your prediction. Your hypothesis should state which will be the best type of beak for each type of food and explain why you think that.

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### Materials

- Test tube clamp
- Plastic spoon
- Pencils (Use as Chopsticks)
- Plastic Fork
- Paper clips
- Tooth picks
- Beads
- Dixie cups
- Trays/Containers
- Rubber bands

### Procedures

1. As a group decide which beak you have. Either a spoon, pencils, fork OR a test tube clamp. Each student will also get a plastic cup.
2. You are now a very hungry bird. The tool you have selected is your "beak". You can only use your beak to pick up food.
3. The cup is your stomach. It 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 that is placed in the cup by the beak has been "eaten". No scooping is allowed and no fighting over food with other birds.
4. When the teacher says "Go" you will have 30 seconds to feed (or until the food runs out). Collect as much food in your stomach as possible until the teacher says "Stop".
5. **Anyone who is not responsible enough to maintain safe behavior at all times will no longer participate in the activity and will become an observer and receive a zero for this lab.**
6. When the teacher says "Stop", students will empty their stomachs and count the contents. Record data in the Individual Data Table. Replace food items.
7. When the teacher says to, rotate the trays through the lab groups so each group has a different food source.
8. Continue steps 4-7 until all food items have been recorded.

### Individual Beak Data

Individual Data	Paper Clips	Beads	Rubber Bands	Toothpicks
Type of Beak				

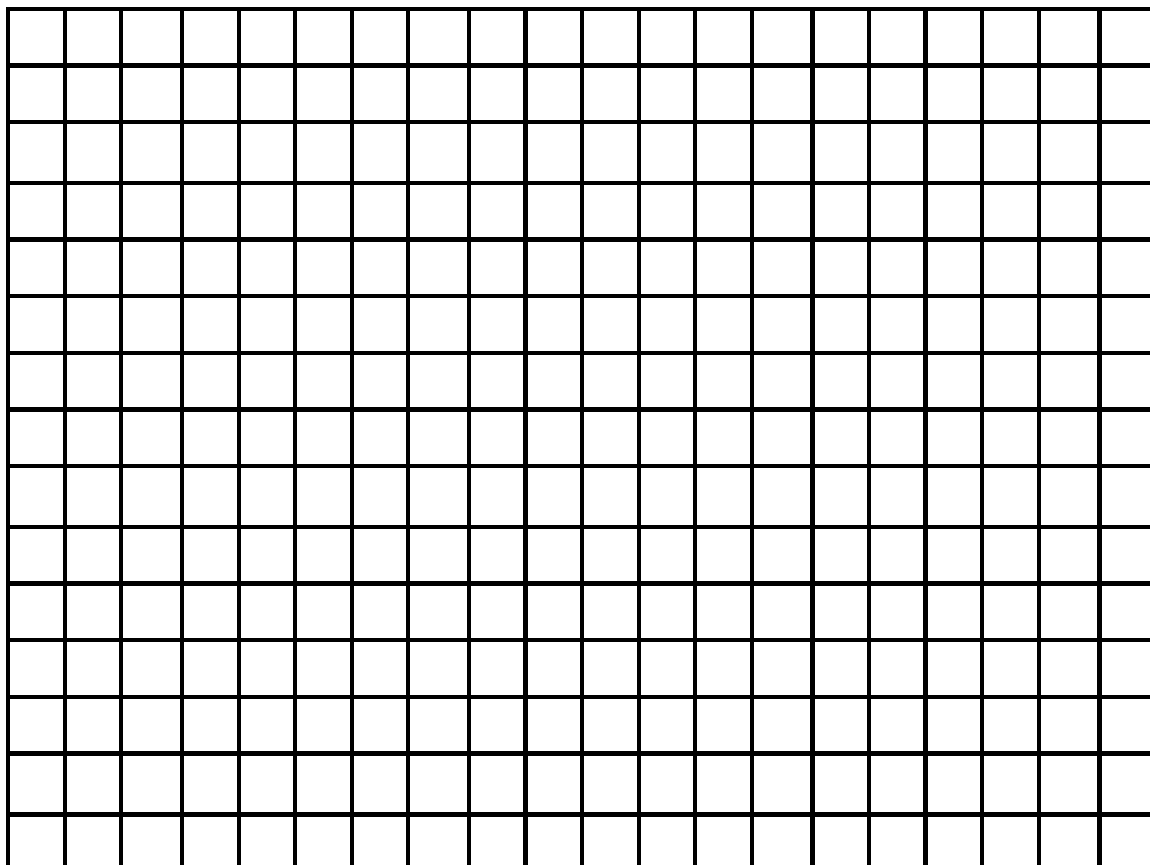
### Lab Group Data

Individual Data	Paper Clips	Beads	Rubber Bands	Toothpicks
Test Tube Clamp				
Pencils				
Spoon				
Fork				

### Graphing the Data

1. In this experiment, what is the dependent variable? What is the independent variable?  

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2. Create BAR graph for your group's data for this experiment. Make sure to include a title, label the axis, make a key if needed, and use MOST of the graph.



## Analysis

1. Which type of beak was best adapted to each type of food? Which beak was least adapted to each type of food?

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2. What if the paper clips were high-protein beetles that were 4 times more nutritious than any of the other food items? How would your feeding strategy change?

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3. What would happen if all of the bird types in this activity flew to an island where no birds had been before and the only food available was beads? Which birds would be most successful? Which birds would be least successful?

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4. If we came back to this same island (from #3) in 50 years, what should we expect to see? (What type of birds will live on the island?)

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5. Define natural selection. Explain how this lab demonstrates natural selection.

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