Bird Beak Buffet Lab Procedures

**Purpose:** To learn about the advantages and disadvantages of beaks by simulating birds with different types of beaks competing for various foods.

**Introduction:** Bird beaks are multi-functional tools. Birds use them to weave nests, defend their territory, attack competitors, groom feathers, communicate, and most significantly, to gather or capture food.

Animals that have variations that enable them to take advantage of available foods will be more likely to survive. **Adaptations are characteristics that increase an organism's chance of survival.** Those with the most helpful adaptations will have good fitness (most likely to live long enough to pass on their genes to the next generation.)

Over the years, a wide assortment of bird beaks has evolved. Though many birds have straight beaks that are adapted to general feeding, some birds beaks are examples of unique adaptations. Understanding the concept of adaptive advantage is required for understanding of how populations exist in ecosystems.

**Hawaiian Bird Beaks and Their Uses:**

- The Hawaiian Owl or Pueo eats insects and rodents as well as other birds. The Pueo may also prey upon the native ʻōpeʻapeʻa (Hawaiian hoary bat).
- The Hawaiian Crow or ʻalalā is an omnivorous bird that feeds on fruit, nectar and insects. Its diet has changed due to changes in its habitat, but the original populations of ʻalalā fed primarily on native berries.
- The Hawaiian Goose or Nēnē eat grasses, seeds, buds, flowers, berries and leaves, and are especially fond of native plants such as berries of naupaka.
- The Hawaiian Honeycreepers have developed powerful, seed-eating bills that were thick, short and efficient for cracking seeds. Other species evolved more delicate, pointed beaks that were well-adapted for catching insects or sipping nectar.
- As the ʻiʻiwi feeds, you witness a demonstration of **evolutionary adaptation:** the bird’s sickle-shaped bill is a perfect match for the sickle-shaped lobelia flowers from which it is feeding.

**Materials:** spoons, binder clips, clothespins, forks, lids, dried macaroni, beans, paper clips

**Procedures:**

1. Each student will be given a spoon, binder clip, clothespin and fork. Each student will also get a plastic lid.
2. You are a hungry bird. The tool you have selected is your “beak.” You can only use your beak to pick up food.
3. The lid is your stomach. It must remain upright at all times. You must hold your beak in one hand and your stomach in the other hand. Only food placed in your lid by your beak has been “eaten.”
4. **Make a hypothesis on which type of beak will be able to collect the most of each type of food on your worksheet. Make sure it is an “If and then” statement.**
5. Food items will be placed in your “habitat.” The habitat is a container. When the teacher says “go” you will have 30 seconds to feed. Collect as much food in your stomach (lid) as possible until the teacher says “stop.”
6. **Anyone who is not responsible enough to maintain a safe behavior will no longer participate in the activity and will become an observer.**
7. When the teacher says “stop”, students will empty their stomachs and count the contents. **Record data on Individual data table.**
8. Repeat the activity with another beak until all beaks have been used. **Record data on Individual data table.**
9. **Make one quantitative and qualitative observation on worksheet.**
10. Once your group is done, find the average of your group’s data. **Record it on your Group data table.**
11. Collect the data from the other groups to get the Class data.
12. Complete the rest of the questions on the Bird Beak Buffet Lab Worksheet.
Final Lab Report Definitions

**Statement of Problem:** A question that can’t be answered with yes or no.

**Hypothesis:** If/then statement that predicts a relationship or trend.

**Variables:** something measurable that can change in an experiment
- **Independent variable:** variable you have control over in an experiment
- **Dependent variable:** variable that changes because of the independent variable; you don’t have control over it

**Materials:**
List all materials needed for your experiment

**Procedure:**
Step by step instructions that are detailed enough for someone else to follow.

**Observations:**
- **Qualitative observations** are *subjective*. They depend upon the person observing them. Use all of your *senses* to make observations.
- **Quantitative observations** are *objective*. They do not depend on the person observing them. These observations are your numerical data.

**Data:** A thorough synopsis (summary) of your quantitative data

**Sources of error:** Discuss anything that may have changed your results. (1 paragraph)
- Human error
- Other error

**Conclusion:** In a few paragraphs summarize your results by including the given information.
- Restate your hypothesis
- Give reasons for why your hypothesis should be *supported or rejected* (Use your results.)
- Recommend some practical applications for your experiment.