

# Survival of the Fittest!

Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

## Introduction:

In any habitat, food may be limited and the types of foods available may also 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.* Adaptations are not always present in an entire population. Only those with the most helpful adaptations for a specific environment will most likely survive and reproduce, a process known as **natural selection** or **survival of the fittest**. The individuals without the adaptation will fail to compete, and will either die or attempt to migrate. This process ensures that beneficial adaptations will continue in future generations, while disadvantageous characteristics will not.

## Purpose:

In this lab, you will simulate a bird species with a specialized bill. In your community (classroom), you will live with other birds that have differing bill shapes and sizes. Each bill is specialized for a certain food type; the shape and size of a bill is related to what a bird eats. You, the bird, will gather food (to the best of your ability), record the number of items you retrieved and analyze the data.

## Pre-Lab Questions:

1. **Define** the term adaptation.
2. **Describe** an adaptation that you have observed in a plant or animal and **explain**, using one example, how the adaptation helps the organism to survive in the environment.

## Materials:

4 beak types:

*Scooper bill – two spoons*

*Stabber bill – tweezers*

*Duck bill – two tongue depressors*

*Grasper bill - clothespin*

Stomach – cup

4 Environments with food:

*Penny beetles*

*Marble snails*

*Bead seeds*

*Straw worms*

## Procedures:

1. A bill type will be assigned to each of your group members. Write their names below:

*Scooper bill* \_\_\_\_\_

*Duck bill* \_\_\_\_\_

*Stabber bill* \_\_\_\_\_

*Grasper bill* \_\_\_\_\_

2. Create a hypothesis on which bill will be is best suited for the following food types:

*Penny beetles* \_\_\_\_\_

*Marble snails* \_\_\_\_\_

*Bead seeds* \_\_\_\_\_

*Straw worms* \_\_\_\_\_

3. Each bird must pick up food using their bill and drop the food into their stomach.
4. **FOOD ITEMS MAY NOT BE SCOOPED OR THROWN INTO THE STOMACH; THE STOMACH MUST BE HELD UPRIGHT!**
5. The predator (teacher) will give the signal to start catching food.

6. All birds will drop their bill when given the signal to stop eating.
7. If a food item is in your bill but not in your stomach, then it does not count and you must put it back into the community.
8. Each bird will count the number of food items in its stomach and record the data in the data table.
9. Reset your station and when told, rotate to the next station and repeat the experiment.
10. **REMEMBER:** The teacher is the predator and will feed on individual birds that disrupt the community!!!! Please keep a safe environment to avoid being removed from the lab.

**Table 1: Amount of each Type of Food Collected by Each Bill Type**

Write down how many of each food type each beak was able to consume in each environment.

Beak Type	Penny Beetles	Marble Snails	Bead Seeds	Straw Worms
Scooper Bill				
Grasper Beak				
Duck Beak				
Stabber Beak				

**Results:**

Using graph paper, make a bar graph for the amount of food collected by each bird in the four different environments. Be sure to make an appropriate title, have a key showing the different types of beaks and label the axes.

**Post-Lab Questions:**

1. Which food item was best for your bill? Give at least one reason why and support your reason with evidence (your data).
2. Which bill was the best at capturing a single food type?
3. Which bill was better adapted for catching multiple types of food?
4. How did this simulation relate to Darwin's theory of natural selection?
5. In the Winter of 2015 all the marble snails were killed off by a snail disease, eliminating a resource for the birds in for the spring. From your data predict what bird type would not survive the year. Give at least one reason why and support your reason with evidence (your data).