

Introduction to Adaptations and Mutations – Food for the Bird Brain



An adaptation is: _____

Is *environment* a factor? _____ Why/Why Not? _____

Can you think of a specific example of an adaptation that doesn't include something that you've talked about in class? (write it down!) _____



Take a look at this photo:



Pick one type of beak (which one did you pick?) _____

What kind of food do you think that it eats? _____

What makes you think that? _____

Goal: experience the connection between the shape and structure of different bird beak sand the bird’s ability to eat available food(s).

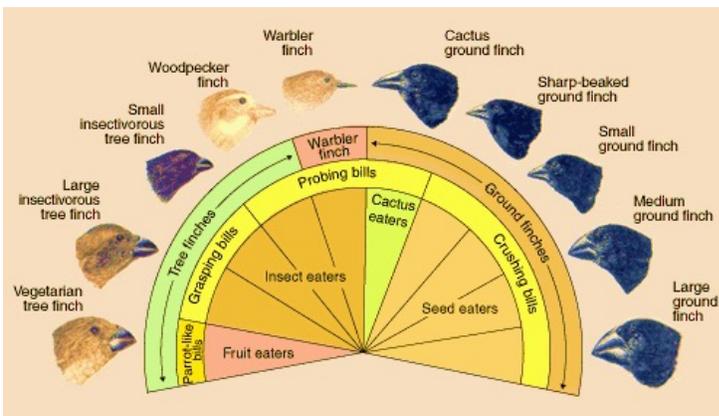
Materials:

- One cup (bird stomach)
- One bird beak:
 - Tweezers (gripper)
 - Skewer (prober/scooper)
 - Spoon (crusher)
 - Straws (drinker)
- Your instructor will distribute different foods that each bird will gather from around the area (worms, fruit, birdseed, nectar).
- Do not eat the food!

Directions:

First and foremost – The teacher is the **HAWK** that eats birds. Unruly behavior or violation of rules will result in the hawk capturing the conspicuous bird and making it sit out for one round. Unusual behavior draws attention from predators!

There are many different types of beak adaptations that relate to the foods that birds eat.



Different beaks are suited for different foods.

Think about it: what kind of utensil are you going to grab if you’re eating ice cream or soup... a fork? A knife? Probably not. But what would happen if all you had were knives to eat your soup? And why does this analogy fail when talking about humans?

- In this activity, you will be using spoons, tweezers, skewers and straws to gather food.
- Each student will be given a “beak” and a “stomach.”
- The birds must pick up food using only the beak and then drop the food into their stomach. Food MAY NOT be scooped or thrown into the stomach, and the stomach must be held upright.
- DO NOT push or shove... but don’t be too nice about it or you may starve!

After the first round: what did you notice about who got the most food? _____

Why do you think this was the case? _____

Mutations

A mutation is a change in the DNA. Contrary to what every zombie movie might have led you to believe, mutations can be super helpful. In fact, *most* of the diversity of species is the result of mutations.

A piece of DNA might look like this →	T=A A=T T=A C≡G A=T A=T G≡C C≡G	T=A A=T T=A G≡ C≡G A=T A=T G≡C G≡C C≡G	T=A A=T T=A C≡ A=T A=T G≡C C≡G	T=A A=T T=A G≡G A=T A=T G≡C C≡G
There are lots of ways that DNA can change →	Typical	Insertion	Deletion	Substitution
What happens?		An extra G is inserted	A G is deleted	The C in the C≡G bond is replaced with a G
What does it mean?	Mutations can be helpful, harmful, or neutral, it all depends.			

Second round: Let's see how mutations can be helpful, harmful, or neutral.

Mutations have occurred in your bird's beak:

- Tweezers are now clothespins
- Skewers are shorter
- Spoons experience no visible change
- Straws are short and wide

After the second round: Were there any differences in who got the most food? _____

Why do you think this happened? _____

Third round: a drastic change in climate (drought; no water)

What happened? _____