Bird Beak Bonanza

**Introduction:** Charles Darwin is associated with the evolutionary theory of natural selection. Darwin said that the forces of nature selects species to survive that are best adapted to the environment and that these species in turn produce offspring and their numbers increase. Darwin proposed four parts of natural selection:

1. Genetic Variation
2. Overproduction
3. Struggle for existence
4. Survival and reproduction.

**Materials:**

* Plastic spoon
* Toothpicks
* Plastic forks
* Clothes Pins
* Marshmallows or raisins
* Sunflower seeds
* Paper plates and cups

**Rules of the Bonanza:**

1. You may not use your hand except to hold the utensil (your “beak”) and to hold your “nest” still.
2. You may not push other “birds,” deliberately knock the food out of the other “birds’ beaks,” or steal food from the other “birds’ nests.”
3. You must put your nest on the floor next to you seat and not move it.
4. When your teacher says that time is up, stop. If you have food held securely in your beak, you may drop it in your nest.
5. DO NOT EAT ANY OF THE FOOD!!!!

**Procedure:**

(**NOTE:** Not every student will participate in the simulation for each round. If you are not participating for a round, your responsibility is to collect the data and share it with those who did participate.)

1. Holding your “beak” in your hand, gather food and drop it into your nest. Any food that falls onto the floor is not part of your nest!! Complete this as many times as possible in the allowed time (20 seconds).
2. When your teach tell you the round is over, STOP. Look over Table 1 to determine if you collected enough food to survive to the next round and reproduce.
3. Complete steps 1 and 2 for 2 additional rounds.
4. Repeat all steps in Drought situation.

**Table 1**

|  |  |
| --- | --- |
| **Food Piece Collected** | **Outcome** |
| **Fewer than 5** | **Do not survive** |
| **6-11** | **Survive but not reproduce** |
| **12-16** | **Survive and produce 1 offspring** |
| **17-21** | **Survive and produce 2 offspring** |
| **22-26 or more**  | **Survive and produce 3 offspring** |

1. Once you have filled in both of your data tables you are required to graph your results on graph paper and staple this into your composition book.

**Post Lab Questions:**

1. Was there one beak phenotype that was more successful than another in rounds 1-2 non drought? If so, which one.
2. Describe the pattern of change for each beak type as displayed in your graph. Identify the most successful beak type or types and hypothesize reasons for this success.
3. Did the frequency of the different beak variation change when the food source changed? If so, formulate and explanation for why this happened?
4. Work with a classmate to make a list of how this simulation activity showed natural conditions and ways that this differed from natural conditions. Suggest one change to the simulation that could control for an additional variable or more closely simulate the natural world.

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