1. Purpose: To evaluate how traits and the environment influence the evolution or extinction of a species.
2. Procedure:

Scenario 1

* 1. There are 50 Nerds and 50 Reece’s Pieces in two separate bowls. You are the predator for the Nerd and RP species. You are allowed to choose one of them to eat. After you finish complete the data table below.

Scenario 2

* 1. In the second scenario you will need to count the number of Reece’s Pieces by color and add them to you data table in order to start.
  2. You will once again play the role of the predator. You will each take a turn closing your eyes and selecting the first Reece’s Pieces that you see when you open your eyes. Once each member has gone one time, record the new results in your data table.
  3. Raise your hand as the RP’s will reproduce (conducted by teacher). Then repeat steps b-c for 2 more rounds.

1. Data Table

Scenario 1

|  |  |  |
| --- | --- | --- |
| Candy Type | Original Number of Individuals | Final Number of Individuals |
| Nerds | 50 | 46 |
| Reece’s Pieces | 50 | 39 |

Scenario 2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Color | Original # (1st round) | Final # (1st Round) | Original # (2nd Round) | Final # (2nd Round) | Original # (3rd Round) | Final # (3rd Round) |
| Orange | 4 | 3 | 6 | 4 | 7 | 5 |
| Brown | 4 | 2 | 4 | 3 | 6 | 5 |

1. Analysis:

Scenario 1

* 1. What characteristic or trait caused the candies to be selected or not selected?

Reece’s Pieces are larger than Nerds, and they taste better.

* 1. How would a mutation to you as a predator impact the candy selection if your species all had an allergy to peanut butter?

I wouldn’t be able to eat it therefore I would have to choose the Nerds.

* 1. What would happen to the Reece’s Pieces species given enough time (you as students were allowed to continue the experiment.)

The Reece’s would not have survived. They would have all been devoured.

Scenario 2

* 1. What factor in this section of the lab influenced which color was selected versus not being selected?

The color of the paper determines what color is more likely to be eaten more.

* 1. Predict what would happen given enough rounds. How would this relate to real world scenarios?

The orange would survive on the orange paper and the brown would survive on the brown paper. This relates to the moth activity we worked on where the white moths survived in the light forest and vice versa with the dark moths and dark forests.

**Laboratory Investigation II:**

In this portion of the lab, each of you will be assigned an animal (your animal is the tool you will be given to capture your prey). I will randomly give each of you your tool. The tool is your predator and the candies are the prey. Insert the predators and prey in the following data chart and hypothesis about the predators and prey. Rank them in order from first to last as to which will be the best to worst. (Best predator will capture the most food while the worst predator will capture the least prey. For the prey the best will be the one captured the least, while the worst will be the one captured the most.)

**Hypothesis Data Table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Predators** | **Predator Rank** | **Prey** | **Prey Rank** |
| Chopstick | 4 | Nerds | 1 |
| Fork | 1 | Reece’s Pieces | 3 |
| Spoon | 3 | Hot Tamale | 2 |
| Knife | 5 | Jelly Beans | 4 |
| Toothpick | 2 | Gummi Worms | 5 |

**Procedures:**

You will be given a bowl of prey. There will be 50 of each prey type in the bowl. You will have 30 seconds to capture as many prey and feed your mouth. The cup you will receive represents the mouth and the prey must be captured with your predator without the assistance of your hands touching the prey. You can capture as many prey as possible and you make also steal prey from another predator trying to capture it in the habitat (bowl). Upon time being called record the number of prey that each predator captured and total the numbers in the data table below. Upon completion we will run a second trial of the same experiment to compare our results.

**Data Table:**

Trial 1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Prey Items** | **# prey start** | **Spoon** | **Fork** | **Chopsticks** | **Toothpick** | **Knife** | **Prey Totals** |
| **Nerds** | 25 | 6 | 0 | 0 | 0 | 0 | **6** |
| **Reece Pieces** | 25 | 10 | 0 | 0 | 1 | 0 | **11** |
| **Hot Tamale** | 25 | 6 | 2 | 0 | 0 | 0 | **8** |
| **Jelly Beans** | 25 | 3 | 6 | 0 | 1 | 0 | **10** |
| **Gummi Worms** | 20 | 1 | 3 | 4 | 6 | 6 | **20** |
| **Total Kills** |  | 26 | 11 | 4 | 8 | 6 | **55** |

Trial 2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Prey Items** | **# prey start** | **Spoon** | **Fork** | **Chopsticks** | **Toothpick** | **Knife** | **Prey Totals** |
| Nerds | 38 | 18 | 5 | DEAD | 0 | 0 | **23** |
| Reece Pieces | 28 | 0 | 8 | DEAD | 0 | 1 | **29** |
| Hot Tamale | 33 | 11 | 5 | DEAD | 0 | 6 | **22** |
| Jelly Beans | 24 | 14 | 3 | DEAD | 0 | 0 | **17** |
| Gummi Worms | Extinct | **-** | **-** | **-** | **-** | **-** | **-** |
| **Total Kills** |  | 43 | 21 | - | 0 | 7 | **71** |

**Questions:**

1. What was the best predator? What adaptation did this predator have that made it more successful than the others?

The spoon was the most successful. It was able to scoop up all sizes of the candy and was able to scoop up multiple types at a time.

1. Explain the niche of each predator if this was an actual real life scenario.

The spoon scoops, the fork stabs, the chopsticks can pick up bigger items, the toothpick stabs, and the knife can cut and grab.

1. Which predator would play the role of a generalist in this situation?

The spoon could eat all kinds of food, so it is the generalist.

1. Conclusion: (Explain how environment and traits both together and separately influence evolution. Explain what happens to species in competition with one another for survival but they are not selected with the favorable trait. Be sure to use the honors conclusion format previously given to you and to discuss all three experiments.)

**Scenario 1**

Coming into the lab I was aware that in a situation where two or more prey were presented that the predator would choose which ever one had the more appealing traits such as size, taste, etc. Mrs. McConnell filled two cups with either Reece’s Pieces or Nerds. She then asked the class which one they would prefer and proceeded to provide us with the one we asked. In the lab, there were two cups filled with candy which were considered to be the prey. We, the students whom consumed the candy were considered to be the predators.

During this lab it was found that the majority of the class chose the Reece’s Pieces over the Nerds. At the current time there were only 15 students in the room, and of the 15 only 4 chose Nerds. The remaining 11 chose Reece’s Pieces.

I would offer more of a variety of options to choose from, but that would only work if there was a larger number of students I suppose. In a small class room setting I would leave it the same number, but out in the world there are thousands of different kinds of predators and they all have different preferences of prey. By allowing the students to choose their prey provides the independence that predators have out in the wild.

**Scenario 2**

I came into this lab with the knowledge that I gained from the Moth Lab we did last week. I know that in a light habitat, that the lighter organisms would survive because they are more capable of blending into their surroundings compared to a darker or more vibrant organism. It is vice versa for dark and bright colored organisms and their respective habitats.

In this lab we placed a multitude of Reece’s Pieces onto a colored piece of paper. My group had an orange piece of paper. We then closed our eyes and when we opened them we should have taken and eaten the first RP that we saw. After that Mrs. McConnell replaced our eaten RP with new offspring from the surviving RP.

We had orange paper and brown and orange RP. After closing our eyes we ate the RP that we saw first. Based off of what Mrs. McConnell told us we should have seen the brown RP first, because they stood out on the orange paper and it was vice versa for those with brown paper. We however noticed the orange RP more often, but I believe that is because they were closer to us than the brown ones and did not blend well with the shade of orange paper.

I would not change anything in this lab. This lab shows what would attract a predator more, whether it be color or size in its environment. It also shows the rule of natural selection which is the survival of the fittest and outlines how an organism is capable of surviving so as it has the best characteristics to survive in its immediate ecosystem.

**Scenario 3**

The little knowledge that I came into this lab with was that natural selection chooses who survives and who does not. In order to be able to survive you have to be well adapted enough to survive through many things and be fluctuant in what you do. In this lab we had taken a variety of candies and used multiple instruments to try to eat the candy. We had 30 seconds to get as much food as we could and whoever had the least amount of food after each round was dead. In the lab there were 5 different types of prey and a variety of candy.

In the findings in my group, the chopsticks and the toothpick were the two predators to die because of the lack of food they were able to obtain. They did not have a niche that adapted well enough to the extinctions of the easiest prey which were the gummi worms. In the other groups however, the knife was one of the first to die. I would not change this lab at all. This lab evaluates the true meaning of survival of the fittest and an organism’s ability to adapt to its environment.